مملكة البحرين
وزارة الصحة

KINGDOM OF BAHRAIN
MINISTRY OF HEALTH

DRUG FORMULARY 2015

Drug Formulary 2015

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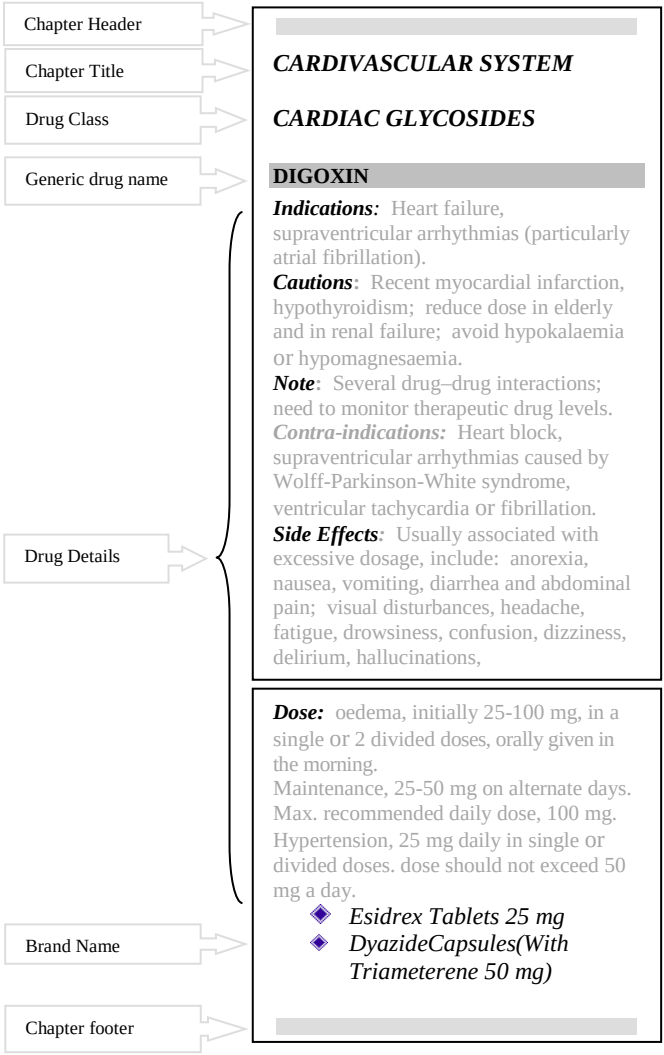
Softcopy (PDF format) link:
www.moh.gov.bh/pdf/drug formulary 2015.pdf

KEYS USED IN THE FORMULARY

Please read the following to clarify the presentation of the drug monographs



BENZODIAZEPINES

Agent	Dosage Forms	Relative Potency	Peak Blood Levels (oral) (h)	Protein Binding (%)	Volume of Distribution (L/kg)	Major Active Metabolite	Half-Life (parent) (hr)	Half-lite (metabolite) (h)	Usual Initial Dose	Adult Oral Dosage Range
Anxiolytic										
Alprazolam	Tab	0.5	1-2	80	0.9-1.2	No	12-15	-	0.25-0.5 tid	0.75-4 mg/d
Diazepam	Gel, Inj. Sol, Tab	5	0.5-2	98	1.1	Yes	20-80	50-100	2-10 mg bid-qid	4-40 mg/d
Lorazepam	Tab	1	1-6	88-92	1.3	No	10-20	-	05-2 mg tid-qid	2-4 mg/d
Sedative / Hypnotic										
Flurazepam	Cap	5	05-2	97	-	Yes	Not significant	40-114	15mg qhs	15-60mg
Temazepam	Cap	5	2-3	96	1.4	No	10-40	-	15-30 mg qhs	15-30 mg
Miscellaneous										
Clonazepam	Tab, drops	0.25-0.5	1-2	86	1.8-4	No	18-50 h	-	0.5 mg tid	1.5-20 mg/d
Clobazam	Tab		1-3	85-91	0.87-1.37	Yes	18	42	5-15 mg/d	5-80 mg/d
Midazolam	Inj		0.4-0.7 (IV only)	95	0.8-6.6	No	2-5 h	-	NA	-

NARCOTIC AGONISTS (Comparative Pharmacokinetics)

Drug	Onset (min)	Peak (h)	Duration (h)	Half-Life (h)	Average Dosing Interval (h)		Equianalgesic Doses[1] (mg)	
							IM	Oral
Alfentanil	Immediate	ND	ND	1-2	-	-	ND	NA
Codeine	PO: 30-60, IM: 10-30	0.5-1	4-6	3-4	3	(3-6)	120	200
Fentanyl	IM: 7-15, IV: Immediate	ND	1-2	1.5-6	1	(0.5-2)	0.1	NA
Hydromorphone	PO: 30, Parenteral: 15	PO IR: 1-1.5 PO SR: 9-10.5	Parenteral: 4-5 PO IR: 3.6 PO SR: 13	2-5	4	(3-6)	1.5	7.5
Meperidine	PO/ IM/ Sub Q: 10-15 IV: ≤5	0.5-1	2-4	3-4	3	(2-4)	75	300
Methadone	PO: 30-60, IV: 10-20	0.5-1	Acute: 4-6 Chronic: >8	15-30	8	(6-12)	10 (A) 2-4 (C)	20 (A) 2-4 (C)
Morphine	PO: 15-60; IV: ≤5	PO/ IM/ SubQ: 0.5-1 IV: 0.3	3-6	2-4	4	(3-6)	10	60[2] (A) 30 (C)
Oxycodone	PO: 10-15	0.5-1	4-6	3-4	4	(3-6)	NA	20
Naloxone[3]	2-5	0.5-2	0.5-1	0.5-1.5	-	-	-	-
Propoxyphene	PO: 30-60	2-2.5	4-6	3.5-15	6	(4-8)	ND	130[4]-200[5]
Remifentanil	1-3	<0.3	0.1-0.2	0.15-0.3	-	-	ND	ND
Sufentanil	1.3-3	ND	ND	2.5-3	-	-	0.02	NA

ND= No data available, NA= Not Applicable, (A)= Acute, (C)= Chronic, IR= Immediate Release, SR=Sustained Release.

[1]Based on acute short-term use. Chronic administration may alter pharmacokinetics and decrease the oral parenteral dose ratio, the morphine oral parenteral ratio decreases to ~1.5-2.5: 1 upon chronic dosing

[2]Extensive survey data suggest that the relative potency of IM, : PO morphine of 1: 6 changes to 1: 2-3 with chronic dosing

[3]Narcotic antagonist.

[4]HCl Salt

[5]Napsylate salt.

CORTICOSTEROIDS, SYSTEMIC EQUIVALENCIES

Glucocorticoids	Approximate Equivalent Dose (mg)	Routes of Administration	Relative Anti-inflammatory Potency	Relative mineralocorticoid Potency	Half-life	
					Plasma (min)	Biologic (h)
Short-Acting						
Cortisone	25	PO, IM	0.8	2	30	8-12
Hydrocortisone	20	IM, IV	1	2	80-118	
Intermediate-Acting						
Prednisone	5	PO	4	1	60	18-36
Prednisolone	5	PO	4	1	115-212	
Triamcinolone	4	PO, IM intra-articular, Intrasynovial, Intradermal, soft tissue injection	5	0	200+	
Methylprednisolone	4	PO, IM< IV	5	0	78-188	
Deflazacort	6	PO	-	-	84-144	
Long-Acting						
Dexamethasone	0.75	PO, IM intra-articular, Intradermal, soft tissue injection	25-30	0	110-210	36-54
Betamethasone	0.6-0.75	PO, IM intra-articular, Intrasynovial, Intradermal, soft tissue injection	25	0	300+	
Mineralocorticoids						
Fludrocortisone	-	PO	10	125	210+	18-36

CORTICOSTEROIDS, TOPICAL

	Steroid	Vehicle
Lowest Potency (may be ineffective for some indications)		
0.05%	Alclometasone dipropionate	}Cream, Ointment
0.5%	Hydrocortisone	
1%	Hydrocortisone	
Low Potency		
0.01%	Fluocinolone acetonide[1]	Solution
Intermediate Potency		
0.1%	Betamethasone valerate	Cream, Ointment
0.1%	Mometasone Furoate	Cream, Ointment, Lotion
0.025%	Fluocinolone acetonide[1]	Cream, Ointment
4mcg/com	Flurandrenolide	Tape
0.1%	Triamcinolone acetonide	Dental paste
High Potency		
0.05%	Betamethasone dipropionate	Cream
0.1%	Betamethasone valerate	Ointment
0.05%	Fluocinonide[1]	Cream, Ointment
Very High Potency		
0.05%	Clobetasol propionate	Cream, Ointment, Scalp lotion

[1]Fluorinated.

Amount of Topical Steroid to Prescribe

Area Treated	Single Dose	7-Day supply
Two hands, head, face, genital, anus	2 g	15-45 g
One arm, front or back of trunk	3 g	20-60 g
One leg	4 g	30-90 g
Whole body	30-60 g	0.2-1.3 kg

Table of Conversion and Measuring

- 1 fluid ounce (fl. oz)	=30ml.
- 2 fluid ounce (fl. oz)	=60ml.
- 4 fluid ounce (fl. oz)	=120ml.
- 8 fluid ounce (fl. oz)	=240ml.
- 1 Kg	=2.25lb.
- 1 lb	=16oz
- 1 grain	=60mg.
- 1 Kg	=1000g.
- 1 g	=1000mg.
- 1 mg	=1000microgram
- 1 microgram	=1000nanogram
- 1 nanogram	=1000picogram
- 1 liter	=1000ml.
- 1 pint	=568ml.
- 1 ml.	=15-20drops
- 1 teaspoon	=5ml.
- 1 tablespoon	=15ml.
- Kilo Calories (Kcal)	=4186.8Joules

Rough guide for the approximate equivalent doses of the main corticosteroids in term of their glucocorticoid (or anti-inflammatory) properties alone is as follows :

Prednisolone	5mg.
= Cortisone acetate	25mg.
= Betamethasone	0.75mg.
= Dexamethasone	0.75mg.
= Hydrocortisone	20mg.
= Methylpredisolone	4mg.
= Prednisone	5mg.
= Triamcinolone	4mg.

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1 - GASTROINTESTINAL SYSTEM

ANTACIDS

ALUMINIUM HYDROXIDE & MAGNESIUM HYDROXIDE

Indications: Dyspepsia**,** used for the symptomatic relief of hyperacidity associated with gastritis, peptic ulceration, oesophageal reflux with heartburn and gastric hyperacidity

Cautions: Patient with gastrointestinal haemorrhage, patient with CHF, oedema, patient on low sodium diets, hypertension, cirrhosis and renal failure.

Contra-indications: Known hypersensitivity to aluminum hydroxide or magnesium hydroxide.

Pregnancy: It is likely to cause complications for the mother or the baby, there is insufficient safety data.

Drug Interactions: Antacids reduce the absorption of other drugs if they are taken at the same time. Drug affected include***:*** azithromycin, benzodiazepines, captopril, ciprofloxacin cimetidine, iron, isoniazid, ketoconazole, naproxen, norfluxacin, ofloxacin, phenytoin, ranitidine, tetracyclines.

Side effect: constipation, chalky taste, stomach cramps, decrease bowel motility, fecal impaction..

Dose: 10 ml - 20 ml suspension or 1-2 tablets chewed 4 times daily after meal and at bed time, children under 12 years not recommended.

- *Moxal Suspension **&** Moxal Chewable Tablets (Aluminium Hydroxide 405 mg & Magnesium Hydroxide 100mg Per 5 ml* Or *Tablet**)***

ANTISPASMODICS

CLIDINIUM BROMIDE AND CHLORDIAZEPOXIDE

Indications: Antispasmodic agent, gastritis, effective as adjunctive therapy in the treatment of peptic ulcer, treatment of irritable bowel syndrome.

Cautions: Use with caution with ethanol or other CNS depressants, because of possible combined effects.

Contra-indications: glaucoma, prostatic hyperplasia, benign bladder neck obstruction, pregnancy, breast-feeding.
Side effect: Blurred vision, confusion, constipation, drowsiness, dry mouth, fainting, lack of coordination, liver problems, minor menstrual irregularities, nausea, skin eruptions, swelling due to fluid retention, urinary difficulties.
Dose: 1-2 tablets 3-4 times daily before meal and at bed time.

- *Librax Tablets (Chlordiazepoxide 5 mg & Clidinium Bromide 2.5 mg/Tablets)*

DICYCLOVERINE HYDROCHLORIDE (Dicyclomine hydrochloride)

Indications: symptomatic relief of gastro-intestinal disorders characterised by smooth muscle spasm
Cautions: Antimuscarinics should be used with caution in Down's syndrome, in children and in the elderly; they should also be used with caution in gastro-oesophageal reflux disease, diarrhoea, ulcerative colitis, autonomic neuropathy, acute myocardial infarction, hypertension, conditions characterised by tachycardia (including hyperthyroidism, cardiac insufficiency, cardiac surgery), pyrexia, and in individuals susceptible to angle-closure glaucoma
Contra-indications: in myasthenia gravis (but may be used to decrease muscarinic ***Side Effects:*** of anticholinesterases—paralytic ileus, pyloric stenosis, toxic megacolon, and prostatic enlargement. also infants under 6 months
Side Effects: constipation, transient bradycardia (followed by tachycardia, palpitation and arrhythmias), reduced bronchial secretions, urinary urgency and retention, dilatation of the pupils with loss of accommodation, photophobia, dry mouth, flushing and dryness of the skin. ***Side Effects:*** that occur occasionally include confusion (particularly in the elderly), nausea, vomiting, and giddiness; very rarely, angle-closure glaucoma may occur.
Pregnancy: not known to be harmful; manufacturer advises use only if essential

Breast-feeding: avoid—present in milk; apnoea reported in infant

Dose: 10–20 mg 3 times daily; INFANT 6–24 months 5–10 mg 3–4 times daily, 15 minutes before feeds; CHILD 2–12 years 10 mg 3 times daily

- *Dicycloverine Tablets, 20 mg,*

HYOSCINE BUTYLBROMIDE

Indications: symptomatic relief of gastro-intestinal or genito-urinary tract disorders characterized by smooth muscle spasm, bowel colic and excessive respiratory secretions.

Contra-indications: hypersensitivity to scopolamine or any component of the formulation of narrow angle glaucoma, GI or GU obstruction, acute hemorrhage, paralytic ileus, thyrotoxicosis, tachycardia secondary to cardiac insufficiency, myasthenia gravis.

Precautions: use with caution with hepatic or renal impairment pregnancy, use with caution in patient with GI obstruction, use with caution in Down syndrome, in children and elderly.

Side effect: anticholinergic side effects including dry mouth, dryness of skin, tachycardia, and urinary retention, constipation, dilatation of the pupil with loss of accommodation, photophobia.

Drug Interactions: decreased effect of paracetamol, levodopa, ketoconazole, digoxin, riboflavin, increased toxicity when given with other anticholinergic agents.

Dose: By mouth, adult dose is 20 mg 4 times daily; child 6-12 years, 10 mg 3 times daily.

Irritable bowel syndrome, 10 mg 3 times daily; increased if necessary up to 20 mg 4 times daily. By IM or IV injection, acute spasm and spasm in diagnostic procedures, 20 mg repeated after 30 minutes if necessary.

- *Buscopan Tablets 10 mg*
- *Buscopan Injection 20 mg/ml (1ml Ampoule)*

MEBEVERINE HYDROCHLORIDE

Indications: adjunct in gastro- intestinal disorders characterized by smooth muscle spasm

Contra-indications: paralytic ileus

Pregnancy: not known to be harmful (manufacturers advise avoid)
Breast-feeding: manufacturers advise avoid (no information available)
Side-effects: allergic reactions (including rash, urticaria, angioedema) reported.
Dose: ADULT and CHILD over 10 years 135–150 mg 3 times daily preferably 20 minutes before meals

- *Mebeverine hydrochloride 200mg Retard Tablets*

PIPENZOLATE BROMIDE

Indications: gastrointestinal colic in children.
Side effect: Blurred vision, confusion, constipation, drowsiness, dry mouth**.**
Dose: 3-6 months, 2 mg 1-2 times daily. 6-12 months, 2 mg 2-3 times daily**.** 1-3 years, 2-4mg 2-3 times daily. Over 3 years, 4mg up to 3 times daily. All doses 15 minutes before feeding.

- *Alinal Oral Drops (Pipenzolate Bromide 4 mg With Phenobarbital 6 mg/ml)*

ULCER-HEALING DRUGS

CIMETIDINE

H2 receptor antagonist**.**
Indications: benign gastric and duodenal ulceration, stomach ulcer, reflux oesophagitis, Zollinger - Ellison syndrome, other conditions where gastric and acid reduction is beneficial.
Cautions: Should be used with caution in impaired renal function, hepatic impairment; in pregnancy and breast-feeding, they may mask symptoms of gastric cancer.
Side effect: Diarrhea and other gastro-intestinal disturbances, dizziness, rash, tiredness; occasionally, gynaecomastia (in high doses), reversible confusional states, reversible liver damage, headache; rarely, decreased blood counts, alopecia, muscle or joint pain, bradycardia; interstitial nephritis and acute pancreatitis.
Drug Interactions: Increases plasma concentration of cyclosporine, diltiazem, labtalol, metronidazole, niphedipine, propranolol, procainamide and quinidine. It also potentiates the effects of warfarin, theophyline,

carbamazepine, phenytoin, chlormethiazole, amitriptyline, desiperamine, imipramine, clonazepam, chlordiazepoxide, diazepam, flurazepam and nitrazepam.Cimetidine increases the cardiac risks associated with lidocaine and decreases absorption of ketokinazole.Rifampicin reduces plasma concentration of cimetidine and absorption of cimetidine may be decreased in the presence of antacids and sucralfate.

Dose: 400 mg twice daily (with breakfast and at night) or 800 mg at night (benign gastric and duodenal ulceration) for at least 4 weeks (6 weeks in gastric ulceration, 8 weeks in NSAID-associated ulceration); when necessary the dose may be increased to 400 mg 4 times daily; INFANT under 1 year 20 mg/kg daily in divided doses has been used; CHILD 1–12 years, 25– 30 mg/kg daily in divided doses; max. 400 mg 4 times daily Maintenance, 400 mg at night or 400mg morning and night. Reflux oesophagitis, 400mg 4 times daily for 4–8 weeks. Prophylaxis of stress ulceration, 200–400mg every 4– 6 hours. Gastric acid reduction (prophylaxis of acid aspiration; do not use syrup), obstetrics 400mg at start of labour, then up to 400 mg every 4 hours if required (max. 2.4 g daily); surgical procedures 400 mg 90–120 minutes before induction of general anaesthesia Short-bowel syndrome, 400mg twice daily (with breakfast and at bedtime) adjusted according to response. To reduce degradation of pancreatic enzyme supplements, 0.8–1.6 g daily in 4 divided doses 1–1½ hours before meals.

- *Dyspamet Syrup 200mg/5ml)*

RANITIDINE

H2 receptor antagonist**.**

Indications: benign gastric and duodenal ulceration, stomal ulcer, reflux oesophagitis, Zollinger-Ellison syndrome, other conditions where reduction of gastric acidity is beneficial.

Cautions: Should be used with caution in impaired renal function, hepatic impairment; dosage modification required, avoid use in patients with history of acute porphyria, in pregnancy and breast feeding, they may mask symptoms of gastric cancer, long term therapy may cause vitamin B 12 deficiency.

Contra-indications: Hypersensitivity to ranitidine**.**

Side effect: Diarrhea and other gastro-intestinal disturbances, dizziness, rash, tiredness; occasionally, gynaecomastia and impotence (in high doses), reversible confusional states, reversible liver damage, headache; rarely, decreased blood counts, alopecia, muscle or joint pain, bradycardia, acute pancreatitis, rarely visual disturbances, tachycardia, agitation, erythema multiforme, alopecia, vasculitis, and very rarely interstitial nephritis..

Dose: by mouth, adult and child over 12 years, 150 mg twice daily or 300 mg at night for 4 to 8 weeks in benign gastric and duodenal ulceration, up to 6 weeks in chronic episodic dyspepsia, and up to 8 weeks in NSAID – associated ulceration (in duodenal ulcer 300 mg can be given twice daily for 4 weeks to achieve higher healing rate). Child over 3 years, (benign gastric and duodenal ulceration) 2-4 mg / kg (max 150 mg) twice daily for 4 to 8 weeks.

Duodenal ulcer associated with H. pylori, 300 mg twice daily, require combination therapy. See under guidelines for treatment of H. pylori.

Prophylaxis of NSAID – associated gastric or duodenal ulcer, adult and child over 12 years 300 mg twice daily.

Gastro- oesophageal reflux disease, adult and child over 12 years, 150 mg twice daily or 300 mg at night for up to 8 weeks or if necessary 12 weeks (moderate to severe, 600 mg daily in 2-4 divided doses for up to12 weeks), long term treatment of healed gastro-oesophageal reflux disease, 150 mg twice daily; child over 3 years, 2.5 – 5 mg / kg (max. 300 mg) twice daily.

Zollinger- Ellison syndrome (proton pump inhibitor is preferred), adult and child over 12 years, 150 mg 3 times daily, doses up to 6 g daily in divided doses have been used.

Gastric acid reduction (prophylaxis of acid aspiration) in obstetrics. By mouth 150 mg at onset of labour, then every 6 hours, surgical procedures, by intramuscular or slow intravenous injection, 50 mg 45-60 minutes before induction of anaesthesia (intravenous injection diluted to 20 ml and given over at least 2 minutes), or by mouth, 150 mg 2 hours before induction of anaesthesia and also when possible on the preceding evening.

By intramuscular injection, 50 mg every 6-8 hours.

By slow intravenous injection, 50 mg diluted to 20 ml and given over at least 2 minutes, may be repeated every 6-8 hours.
By intravenous infusion, 25mg / hour for 2 hours, may be repeated every 6-8 hours.
Prophylaxis of stress ulceration, initial slow intravenous injection of 50 mg (as above) then continuous infusion, 125-250 mcg / kg / hour (may be followed by 150 mg twice daily by mouth when oral feeding commences)

- *Zantac 150mg Tablets*
- *Zantac 50mg/ 2ml Ampoules.*

TRIPOTASSIUM DICITRATE + BISMUTH (Bismuth Chelate))

Indications: benign gastric, duodenal ulceration, and in Helicobacter pylori eradication (combination therapy).
Cautions: Hepatic dysfunction, encephalopathy was reported with prolong use.
Contra-indications: renal impairment; pregnancy.
Side effect: nausea and vomiting and may darken tongue and blacken faeces.
Drug Interactions: It reduces absorption of tetracyclines.
Dose: 2 tablets twice daily or 1 tablet 4 times daily,30 minutes before meal, taken for 28 days followed by further 28 days if necessary. The course may be repeated after intervals of one month. Not recommended for children..

- *De-Nol Tablets 120 mg)*

HELICOBACTER PYLORI INFECTION

Eradication of Helicobacter pylori reduces recurrence of gastric and duodenal ulcers. The presence of H. pylori should be confirmed before starting eradication treatment. Acid inhibition combined with antibacterial treatment is highly effective in the eradication of H. pylori reinfection is rare. Antibiotic-induced colitis is an uncommon risk. For initial treatment, a one-week triple-therapy regimen that comprises a proton pump inhibitor, clarithromycin, and either amoxicillin or metronidazole can be used. However, if a patient has been treated with metronidazole for other infections, a regimen containing a proton pump inhibitor, amoxicillin and clarithromycin is preferred for

initial therapy. If a patient has been treated with clarithromycin for other infections, a regimen containing a proton pump inhibitor, amoxicillin and metronidazole is preferred for initial therapy. These regimens eradicate H. pylori in about 85% of cases. There is usually no need to continue antisecretory treatment (with a proton pump inhibitor or H_2-receptor antagonist) unless the ulcer is large, or complicated by haemorrhage or perforation.
Treatment failure usually indicates antibacterial resistance or poor compliance. Resistance to amoxicillin is rare. However, resistance to clarithromycin and metronidazole is common and can develop during treatment.
Two-week triple-therapy regimens offer the possibility of higher eradication rates compared to one-week regimens, but adverse effects are common and poor compliance is likely to offset any possible gain.
Two-week dual-therapy regimens using a proton pump inhibitor and a single antibacterial are licensed, but produce low rates of H. pylori eradication and are not recommended.
Tinidazole is also used occasionally for H. pylori eradication; it should be combined with antisecretory drugs and other antibacterial.
A two-week regimen comprising a proton pump inhibitor plus tripotassium dicitratobismuthate), plus tetracycline 500 mg four times daily, *plus* metronidazole 400 mg three times daily can be used for eradication failure.
Alternatively, the patient can be referred for endoscopy and treatment based on the results of culture and sensitivity testing.

RECOMMENDED REGIMENS FOR HELICOBACTER PYLORI ERADICATION IN ADULTS

Recommended regimens for Helicobacter pylori eradication in adults

Acid suppressant	Antibacterial		
	Amoxicillin	Clarithromycin	Metronidazole
Esomeprazole 20 mg twice daily	1 g twice daily	500 mg twice daily	-
	-	250 mg twice daily	400 mg twice daily
Omeprazole 20 mg twice daily	1 g twice daily	500 mg twice daily	-
	500 mg 3 times daily	—	400 mg 3 times daily
	—	250 mg twice daily	400 mg twice daily
Rabeprazole 20 mg twice daily	1 g twice daily	500 mg twice daily	—
	—	250 mg twice daily	400 mg twice daily

PROTON PUMP INHIBITORS

ESOMEPRAZOLE

Suppresses gastric acid secretion by blocking proton pump within gastric parietal cells

Indications: gastroesophageal reflux disease (GERD), duodenal ulcer associated with Helicobacter pylori in combination with amoxicillin and clarithromycin or metronidazole,
gastric ulcers associated with continuous NSAID therapy.

Cautions: Used with caution in patients with liver disease, in pregnancy, breast- feeding and it may mask the symptoms of gastric cancer..
Side effect: Flatulence; abdominal pain, dyspepsia, nausea; vomiting, diarrhoea, dry mouth; constipation; Headache; dizziness. Less frequent side effects include dry mouth, insomnia, drowsiness, malaisa, blurred vision, rash, and pruritus and dermatitis.
Dose: By mouth duodenal ulcer associated with Helicobacter pylori 20 mg twice daily for 2 weeks in combination with amoxicillin, 1000 mg twice daily and clarithromycin 500mg twice daily or metronidazole 400 mg twice daily,
NSAID- associated gastric ulcer, 20 mg once daily for 4-8 weeks; Prophylaxis in patients with an increased risk of gastroduodenal complications who required continued NSAID treatment, 20 mg daily.
Gastro- 0esophaeal reflux disease, 40 mg once daily for 4 weeks, continued for further 4 weeks if not fully healed or symptoms persist, maintenance 20 mg daily, symptomatic treatment in the absence of oesophagitis, 20 mg daily for up 4 weeks, then 20 mg daily when required.
Not recommended in children.
By intravenous injection over at least 3 minutes or by intravenous infusion, gastro-oesophageal reflux disease, 40 mg once daily, symtomatic reflux disease without oesopgagitis, treatment of NSAID- associated gastric ulcer, prevention, of NSAID-associated gastric or duodenal ulcer, 20 mg daily, continue until oral administration possible..

- *Nexium Tablets 20, 40 mg*

OMEPRAZOLE

Suppresses gastric acid secretion by blocking acid (proton) pump within gastric parietal cell.
Indications: Benign gastric, duodenal and NSAID induced ulcer, oesophageal reflux disease, ulcer associated with H. pylori infection, Zollinger- Ellison syndrome, gastric acid reduction during anaesthesia, acid-related dyspepsia and severe ulcerating reflux oesophagitis.
Cautions: To be used with caution in presence of liver diseases (dos e not more than 20 mg daily should be

needed, reduced dose, not more than 8 mg daily in severe cases),.gastric malignancy should be excluded before initiation of treatment..

Precautions: Avoid in pregnancy and breast-feeding.

Side Effects: Flatulence; abdominal pain, dyspepsia, nausea; vomiting, diarrhoea, dry mouth; constipation; Headache; dizziness. insomnia, drowsiness, malaisa, rash, pruritus, paraesthesia, vertigo, alopecia, gynaecomastia, impotence, stomatitis, encephalopathy in severe liver disease, hyponatraemia, reversible confusion, Agitation and hallucinations in the severely ill, visual impairment reported with high-dose injection.

Dose: By mouth, benign gastric and duodenal ulcers, 20 mg once daily for 4 weeks in duodenal ulceration or 8 weeks in gastric ulceration, in severe or recurrent cases increase to 40 mg daily, maintenance for recurrent duodenal ulcer, 20 mg once daily, prevention of relapse in duodenal ulcer, 10 mg daily increasing to 20 mg once daily if symptoms return.

NSAID- associated duodenal or gastric ulcer and gastroduodenal erosions, 20 mg once daily for 4 weeks, continued for further 4 weeks if not fully healed, prophylaxis in patients with a history of NSAID-associated duodenal or gastric ulcers, gastroduodenal lesions, or dyspeptic symptoms who require continued NSAID treatment, 200 mg once daily.

Duodenal or benign gastric ulcer associated with H. pylori, omeprazole 20 mg twice daily in combination with amoxicillin, 1000 mg twice daily or 500 mg 3 times daily and clarithromycin 500mg twice daily or metronidazole 400 mg twice daily or 400 mg 3 times daily,

Zollinger- Ellison syndrome, initially 60 mg once daily, usual range 20-120 mg daily (above 80 mg in divided doses).

Gastric acid reduction during general anaesthesia 40 mg on the preceding evening then 40 mg 2-6 hours before surgery.

Gastro-oesophageal reflux disease, 20 mg once daily for 4 weeks, continued for further 4-8 weeks if not fully healed, 40 mg once daily has been given for 8 weeks in gastro-oesophageal reflux disease refractory to other treatment, maintenance, 20 mg once daily.

Acid reflux disease (long term management), 10 mg daily increasing to 20 mg once daily if symptoms return.
Acid related dyspepsia, 10-20 mg once daily for 4- 8 weeks according to response.
Severe ulcerating reflux oesophagitis, child over 1 year, body weight 10-20 kg. 10 mg once daily increased if necessary to 20 mg once daily for 4-12 weeks, body weight over 20 kg, 20 mg once daily increased if necessary to 40 mg once daily for 4-12 weeks, to be initiated by hospital paediatrician.
By intravenous injection over 5 minutes or by intravenous infusion, prophylaxis of acid aspiration, 40 mg completed 1 hour before surgery.
Benign gastric ulcer, duodenal ulcer and gastro-oesophageal reflux, 40 mg once daily until oral administration possible.

- *Omeprazole 20mg Tablets*
- *Losec Tablets 20mg*
- *Omizac Tablets 20mg*
- *Risek Injections 40 mg*

RABEPRAZOLE

Suppresses gastric acid secretion by blocking acid (proton) pump within gastric parietal cells.
Indications: short-term treatment in healing and symptomatic relief of duodenal ulcers and erosive or ulcerative gastroesophageal reflux disease (GERD); maintaining healing and reducing relapse rates of heartburn symptoms in patients with GERD; treatment of daytime and nighttime heartburn and other symptoms associated with GERD; long-term treatment of pathological hypersecretory conditions, including Zollinger-Ellison syndrome and in combination with amoxicillin and clarithromycin to eradicate Helicobacter pylori.
Cautions: Adjust the doses in chronic hepatic function impairment patients.
Precautions: Avoid in pregnancy and breast feeding.
Side effect: Headache; insomnia; anxiety; dizziness; depression; nervousness; dry eyes; abnormal vision**;** Diarrhea; nausea; abdominal pain; vomiting; dyspepsia; flatulence; constipation; dry mouth**.**

Dose: Healing of Duodenal Ulcers, Adults***:*** orally 20 mg/day after the morning meal for 4 wk, additional therapy may be required for some patients.
Treatment of Erosive or Ulcerative GERD, Adults***:*** orally 20 mg/day for 4 to 8 wk, an additional 8 wk may be considered for patients who do not heal. Maintenance of Erosive or Ulcerative GERD, Adults***:*** orally 20 mg/day.
Treatment of Symptomatic GERD, Adults***:*** orally 20 mg once daily for 4 wk. An additional course of treatment may be considered if symptoms do not resolve after 4 weeks.
Treatment of Pathological Hypersecretory Conditions, Adults***:*** orally 60 mg/day. ***Dose***s up to 100mg daily or 60 mg twice daily have been administered.
H. Pylori Eradication to Reduce Risk of Duodenal Ulcer Recurrence, Adults***:*** orally 20 mg rabeprazole plus amoxicillin 1, 000 mg plus clarithromycin 500 mg bid for 7 days with morning and evening meals.

- *Pariet Tablets 20 mg*

ANTI-DIARRHOEALS

LOPERAMIDE HYDROCHLORIDE

Loperamide is acts directly on intestinal muscles to inhibit peristalsis and prolongs transit time enhancing fluid and electrolyte movement through intestinal mucosa, reduces fecal volume, increases viscosity, and diminishes fluid electrolyte loss, demonstrates antisecretory activity exhibits peripheral action.
Indications: Symptomatic treatment of acute diarrhea, adjunct to rehydration in acute and chronic diarrhoea in adults and in adults and in acute diarrho4ea in children over 4 years of age.
Cautions: liver disease; pregnancy.
Contra-indications: Children below 4 years. Diarrhoea of ulcerative colitis or antibiotic-associated colitis. Treatment should be avoided in the patients with acute dysentery, which is characterised with blood in stools and highfever.. Treatment is not recommended for patients who could suffer detrimental effects from rebound constipation. If there is a suspicion of diarrhea associated with organisms that can penetrate the intestinal walls,

such as E. coli or salmonella, loperamide is contraindicated.
Side effect: drowsiness, dizziness, fatigue, sedation, constipation, abdominal pain or discomfort, dry mouth, and nausea, rash, toxic epidermal necrolysis.
Dose: Acute diarrhoea, 4 mg initially followed by 2 mg after each loose stool for up to 5 days, usual dose 6-8 mg daily, max. 16 mg daily, children under 4 years not recommended, Child, 4-8 years, 1 mg 3- 4 times daily for up to 3 days only, 9-12 years, 2 mg 4 times daily for up to 5 days.
Chronic diarrhoea in adults, 4-8 mg daily in divided doses initially and then if necessary adjusted according to response and given twice daily for maintenance. Max. 16 mg daily.

- *Imodium Capsules 2 mg*

TREATMENT OF CHRONIC BOWEL DISORDERS

AZATHIOPRINE

Indications: induction and maintenance of remission in ulcerative colitis and Crohn's disease**.**
Cautions: Use with caution in patients with liver disease, renal impairment, monitor hematological functions regularly, reduce dose in elderly.
Contra-indications: pregnancy, breast feeding.
Side effect: Rash, nausea; vomiting, diarrhoea, anorexia, aphthous stomatitis, pancreatitis, leukopenia; thrombocytopenia; macrocytic anemia; bleeding, selective erythrocyte aplasia**,** fever, chills, alopecia**,** retinopathy, hepatotoxicity, jaundice, hepatic veno-occlusive disease**.**
Drug Interactions: Allopurinol decreases metabolism of azathioprine.
Dose: 1 -3 mg/kg daily given as single dose or twice daily.

- *Imuran Tablets 50 mg*

COLESTYRAMINE (Cholestyramine))

Indications: diarrhoea associated with ileal disease, ileal resection and post vagotomy diarrhoea, pruritis in liver disease. Adjunctive therapy to diet for reduction of

elevated serum cholesterol in patients with primary hypercholesterolemia.
Cautions: Bleeding tendencies related to vitamin K deficiency, folic acid deficiency. Fat-soluble vitamin deficiencies, hyperchloremic acidosis, osteoporosis.pregnancy, breast feeding.
Monitor serum lipids frequently during first few months of therapy and periodically thereafter.
Contra-indications: Hypersensitivity to bile acid sequestering resins; complete biliary obstruction.
Side Effects: Abdominal pain, discomfort, and distention; aggravation of hemorrhoids; anorexia; bleeding; constipation (can be severe and at times accompanied by fecal impaction); diarrhea; eructation; flatulence; nausea; steatorrhea; vomiting.
Drug Interactions: This medicine can interfere with the absorption of other medicines from the gut if they are taken at the same time. To avoid this, any other medicines should be taken at least 1 hour before or 4 to 6 hours after taking colestyramine.
If you are taking any of the following medicines your treatment should be monitored, as colestyramine may alter the effects of these medicines, even if the above advice regarding timing of doses is followed.
Dose: Diarrhoea, initially 12-24 g daily mixed with water in 1-4 divided doses, subsequently adjusted as required, max. 36 g daily, Children 6-12 .
Pruritis, 4-8 g daily. Mixed with water, Children 6-12

- *Questran Powder 4g / Sachet*

INFLIXIMAB

It is a monoclonal antibody that binds to human tumor necrosis factor alpha (TNFα) receptor sites.
Indications: In management of active Crohn's disease in patients who have an inadequate response to conventional therapy; reduce the number of draining enterocutaneous fistulas in fistulizing disease; active rheumatoid arthritis and severe chronic plaque psoriasis.
Cautions: Hepatic impairment, renal impairment, monitor for infections before, during and for 6 months after treatment (Tuberculosis patients should be evaluated before treatment). Active tuberculosis should be treated with standard treatment for at least 2 months before

starting infliximab), heart failure (discontinue if symptoms develop, or worsen, avoid in moderate or severe heart failure).
Contra-indications: in patients with history of active tuberculosis; serious infections such as sepsis, hepatitis, pneumonia, or pyelonephritis**,** pregnancy, breast feeding**.**
Side effect: hypersensitivity reactions including urticaria, dyspnea, and hypotension. Autoimmune antibodies and a lupus-like syndrome have been reported; hepatitis, diarrhea, constipation, cholecystitis, gastro-intestinal haemorrhage, flushing, bradycardia, arrhythmias, fatigue, anxiety, drowsiness, dizziness.
Dose: Crohn's disease, moderately to severely active***:*** 5mg/kg as a single infusion over a minimum of 2 hours. In fistulizing***:*** 5mg/kg as an infusion over a minimum of 2 hours; dose repeated after 2 and 6 weeks from initial infusion.

- *Remicade Injections (IV Infusion) 100mg*

MESALAZINE (Mesalamine) (5-Aminosalicylic Acid)

Indications: ulcerative colitis**,** management of active Crohn's disease. Rectally used to treat distal ulcerative colitis, proctosigmoiditis, or proctitis.
Cautions: renal disorders; raised blood urea or proteinuria; pericarditis; Pancreatitis, pregnancy, breast feeding.
Contra-indications: sensitivity to salicylates; moderate and severe renal impairment; hepatic impairment, children under 2 years of age.
Side effect: cramping, acute abdominal pain, bloody diarrhea; vomiting, nausea, headache; depression of bone marrow, chest pain, shortness of breath, pancreatitis and preicarditis should be considered, sore throat, hemorrhoids, blood disorders, renal dysfunction, skin reactions (including lupus erythematosus- like syndrome, Stevens- Johnson syndrome), alopecia.
Dose: Adult (usual course of therapy is 3-8 weeks)***:*** Orally***:*** treatment of ulcerative colitis, initial***:*** 2 tablets 3 times / days for 6 weeks, maintenance of remission of ulcerative colitis, 1.6 g / day in divided doses. Rectally***:*** one supp. (500mg) twice daily. Some patients may require rectal and oral therapy concurrently.

- *Asacol Tablets 400mg*

- *Pentasa Tablets 500mg*
- *Pentasa Rectal Suppositories 500mg, 1g*
- *Mesalazine Enema 1g, 2g*
- *Mesalazine Sachet 1g, 2g*

PREDNISOLONE

Indications: induction and maintenance of remission in ulcerative colitis; and Crohn's disease.
Cautions: Use with caution in hyperthyroidism, cirrhosis, hypertension, osteoporosis, congestive heart failure, diabetes, peptic ulcer, and myasthenia gravis, renal impairment, corneal perforation, epilepsy, hypothyroidism, hypertension, pregnancy, breast feeding, frequent monitoring required if history of tuberculosis.
Contra-indications: glaucoma, hypersensitivity, systemic fungal infections, certain viral infections such as varicella and herpes genitalis infections.
Side effect: Gastric and duodenal ulceration, with possible perforation and hemorrhage may occasionally occur, Cushing-like syndrome, menstrual irregularities, hirsutism, Acute adrenal insufficiency may occur with abrupt withdrawal after long term therapy.
Drug Interactions: barbiturates, phenytoin, salicylates, vaccines, rifampicin, cholestyramine and colestipol decreased corticosteroids effect. Corticosteroids may decrease the effect of oral hypoglycemic agents, anticoagulants, aspirin, oral contraceptives.
Dose: by mouth, initial dose 10-20 mg daily, in single or divided doses, until remission occurs, followed by reducing doses. Rectally, initially, 20 mg enema daily at bedtime for 2-4 weeks then reduced to one enema on alternate days. The enema should be retained for at least 1 hour.

- *Prednisolone Tablets 1mg, 5mg & 20mg*
- *Prednisolone Retention Enema 0.2%*
- *Prednisolone 15mg/5ml syrup*

SULFASALAZINE

Indications: induction and maintenance of remission in ulcerative colitis and colonic Crohn's disease; rheumatoid arthritis.

Cautions: adequate fluid intake to prevent crystalluria, pregnancy, hepatic and renal disease, G6PD deficiency. Blood counts and urine analysis necessary during prolonged treatment; withdraw treatment if blood dyscrasias or hypersensitivity reactions develop.
Contra-indications: sensitivity to salicylates and sulfonamides. children under 2 years of age
Side effect: gastro-intestinal effects, loss of appetite, fever, blood disorders, hypersensitivity reactions, ocular complications, stomatitis, parotitis, ataxia, aseptic meningitis, vertigo, tinnitus, insomnia, depression, hallucinations, kidney reactions; oligospermia; urine may be coloured orange.
Drug Interactions: Sulfasalazine interact with digoxin, folic acid, azathioprine, mercaptopurine, hydantoin, hypoglycemics, methenamine, methotrexate, NSAID, sulfinpyrazone, thiazide, thiopental, uricosuric agents, para- aminobenzoic acid, warfarin.
Dose: by mouth, acute attacks, 1-2 g 4 times daily until remission occurs (if necessary corticosteroids may also be given), reducing to a maintenance dose of 500 mg 3-4 times daily. Child, acute 40-60 mg/kg daily; Maintenance dose, 20-30 mg/kg daily.

- *Salazopyrin Tablets EC 500mg*

LAXATIVES

BISACODYL

Indications: constipation, bowel evacuation before radiological procedures, endoscopy and surgery. Tablets act within 10-12 hours while suppositories within 1 hour.
Contra-indications: Nausea, vomiting, or other symptoms of appendicitis; acute surgical abdominal conditions; fecal impaction; intestinal obstruction; undiagnosed abdominal pain; ulcerative lesions of colon; ulcerative hemorrhoids.
Side effect: Excessive bowel activity (griping, diarrhoea, nausea, vomiting); perianal irritation; bloating; flatulence; abdominal cramping; proctitis and inflammation. Dizziness, fainting. Palpitations.
Dose: by mouth for constipation, 5-10 mg after meals usually at night; avoid taking with milk and antacids,

child 4-10 years (on medical advice only) 5 mg at night, over 10 years, adult dose. Rectally, 10 mg in the morning. Child under 10 years, 5 mg suppository inserted, over 10 years, adult dose 20-60 minutes before evacuation is required.

Before radiological procedures and surgery, by mouth, 10-20 mg at bedtime before examination and by rectum in suppository 10 mg the following morning,.child 4-10 years by mouth, 5mg the night before procedure and by rectum in suppositories, 5 mg the following morning, over 10 years, adult dose.

- *Dulcolax Tablets 5 mg*
- *Bisacodyl Suppositories 5 mg & 10 mg*

CASTOR OIL

Indications: constipation, bowel evacuation before radiological procedures, endoscopy, surgery. Acts within 2-8 hours.

Contra-indications: intestinal obstruction.

Precautions: pregnancy, menstruation, undiagnosed abdominal pain.

Side Effects: nausea, vomiting, abdominal colic, severe purgative.

Dose: 5-20 ml when required. Child up to 1 year, 1-5 ml; 1-12 years, 5-15 ml in milk or fruit juice before breakfast or on an empty stomach.

- *Castor Oil*

GLYCERIN

Indications: Relieving occasional constipation, promotes peristalsis and evacuation of the lower bowel.

Contra-indications: Known hypersensitivity to glycerin anuria, severe dehydration.

Precautions: use cautiously in hypovolemia, confused mental state, congestive heart failure, elderly, senile, diabetic, and severely dehydrated patients, pregnancy.

Side effect: Anal irritation; burning sensation; diarrhea; gas; nausea; stomach cramps.

Dose: Children***:*** 1 child suppository as needed. Adult***:*** 1 adult suppository as needed**.**

- *Glycerin Suppositories Child & Adult*

LACTULOSE

It contains lactulose 3.35 gm per 5 ml
Indications: Treatment of constipation; prevention and treatment of portal-systemic encephalopathy, including stages of hepatic precoma and coma. It produces increased osmotic pressure within colon and acidifies its contents, resulting in increased stool water content and stool softening. The onset appears after 24 to 48 hr.
Contra-indications: galactosaemia, intestinal obstruction..
Precautions: lactose intolerance, patients on galactose-free diet. diabetes mellitus.
Side effect: Gaseous distention with flatulence or belching, abdominal discomfort and cramping; diarrhea; nausea; vomiting.
Dose: Constipation, initially15 ml twice daily, gradually reduced according to patient's needs. Child, less than 1 year, 2.5 ml. Child 1-5 years, 5 ml. 6-12 years, 10 ml twice daily, gradually reduced.
Hepatic encephalopathy, 30-50 ml 3 times daily, subsequently adjusted to produce 2-3 soft stools daily.

- *Duphalac Syrup*
- *Ezilax Syrup*

MAGNESIUM HYDROXIDE

Indications: Treating acid indigestion, heartburn, and constipation.
Contra-indications: acute gastro-intestinal conditions.
Precautions: Use with caution in patients with severe renal impairment, hepatic impairment, elderly and hypermagnesaemia.
Side effect: diarrhea, hypermagnesaemia, colic, hypotension and muscle weakness.
Drug Interactions: This medicine can interfere with the absorption of other medicines from the gut if they are taken at the same time. To avoid this, any other medicines should be taken at least 2-3 hours before taking magnesium hydroxide.
Dose: Adult***:*** 30-60 ml/day or in divided doses. 6-12 years***:*** 15-30 ml/day or in divided doses. 2-5 years***:*** 5-15 ml/day or in divided doses..

- *Milk Of Magnesia*

- *Laxomag Liquid*

MAGNESIUM SULFATE

Indications: Constipation; evacuation of bowel.
Contra-indications: As for magnesium hydroxide.
Precautions: As for magnesium hydroxide
Side effect: As for magnesium hydroxide
Drug Interactions: As for magnesium hydroxide.
Dose: rectally, 60-180 ml of 50% solution in water
Orally for rapid bowel evacuation in 2-4 hours, 5-10 g in a glass of water before breakfast.

- *Magnesium Sulfate Enema 50% In Water*

PRUCALOPRIDE

Indications: chronic constipation in women when other laxatives fail to provide an adequate response
Cautions: history of arrhythmias or ischemic heart disease; concomitant use with drugs that prolong QT interval; severe, unstable chronic illness.
Contra-indications: intestinal perforation or obstruction; severe inflammatory conditions of the intestinal tract (such as Crohn's disease, ulcerative colitis, and toxic megacolon)
Hepatic impairment: in severe impairment, initially 1 mg once daily, increased if necessary to 2 mg once daily
Renal impairment: max. 1 mg daily if eGFR less than 30 ml/ minute/1.73 m^2
Pregnancy: manufacturer advises avoid and recommends effective contraception during treatment
Breast-feeding: manufacturer advises avoid—present in milk
Side Effects: nausea, vomiting, abdominal pain, dyspepsia, flatulence, diarrhoea, rectal bleeding; headache, dizziness, fatigue; polyuria; less commonly anorexia, palpitation, tremor, and fever
Dose: ADULT over 18 years, 2 mg once daily; ELDERLY over 65 years, initially 1 mg once daily, increased if necessary to 2 mg once daily
Note: Review treatment if no response after 4 weeks

- *Resolor Tablets 2mg*

ANTI-HEMORRHOIDAL

HEMORRHOIDAL PREPARATION

Bismuth, menthol, zinc and lidocaine
Indications: External and internal hemorrhoids, anal eczema, anal fissures, anal pruritus, proctitis, anal itching, pre and post-operative treatment.
Dose: Ointment***:*** 2-3 times daily. Suppository***:*** one suppository morning and one evening.

- *Hemoproct Ointment*
- *Hemoproct Suppositories*

HEMORRHOIDAL PREPARATION with STEROID

Bismuth, menthol, zinc, lidocaine and steroid
Indications: External and internal hemorrhoids, anal eczema, anal fissures, anal pruritus, proctitis, anal itching, pre and post-operative treatment.
Contra-indications: As for hydrocortisone.
Precautions: As for hydrocortisone.
Side effect: As for hydrocortisone.
Drug Interactions: As for hydrocortisone.
Dose: Ointment***:*** 2-3 times daily. Suppository***:*** one suppository morning and one evening.

- *Proctoheal Ointment*
- *Proctoheal Suppositories*

LIDOCAINE (Lignocaine))

Indications: analgesic ointment for painful and various anal conditions.
Precautions: do not leave on large body areas for > 2 hours.
Side effect: itching, rash, edema of skin, contact dermatitis.
Dose: apply locally once or twice daily

- *Lidocaine 5% Ointment*

DRUGS AFFECTING INTESTINAL SECRETIONS

PANCREATIN

Indications: replacement therapy in pancreatic enzyme deficiency states such as cystic fibrosis, chronic

pancreatitis, pancreatectomy, total gastrectomy, gastric partial resections and ductal obstruction from neoplasm.
Precautions: severe liver disease, bile duct obstruction, pregnancy**.**
Side effect: Colonic strictures; diarrhea; abdominal pain; vomiting; constipation; flatulence; nausea; bloating; cramping, can irritate the perioral skin and buccal mucosa if retained in mouth long enough.
Dose: initially one or two capsules with each meal and snack, then adjust according to response. Maintenance, 5-15 capsules daily. Capsules can be swallowed whole or opened before use and sprinkled on food or fluid and should not be chewed.

- *Creon 10, 000 (Lipase 10, 000 Units, Amylase 8000 Units & Protease 600 Units / Capsule)*

URSODIOL (Ursodeoxycholic acid, UDCA)))

Indications: dissolution of cholesterol gallstones, hyperlipidaemia**,** primary biliary cirrhosis.
Cautions: Patients with variceal bleeding, hepatic encephalopathy, ascites or in need of an urgent liver transplant should receive appropriate specific treatment.
Contra-indications: radio-opaque stones, pregnancy, non- functioning gall bladder, inflammatory diseases and other conditions of small intestinal, colon and liver which interfere with enterohepatic circulation of bile salts.
Drug Interactions: absorption of bile acids possibly reduced by antacids and by lipid – regulating drugs, ursodeoxycholic acid increases absorption of cyclosporine.
Side effect: Constipation; diarrhea; dry skin; gas; headache; indigestion; metallic taste; muscle or joint pain; nausea; skin rash; stomach pain; swelling; tiredness.
Dose: In dissolution of gallstones, 8-12 mg/kg daily as a single dose at bedtime or in two divided doses, for up to 2 years, treatment is continued for 3-4 months after stones dissolve.
In treatment of primary biliary cirrhosis, 13-15 mg/kg/day administered in two to four divided doses with food. Dosing regimen should be adjusted according to each patient's need at the discretion of the physician.

- *Urso 125 mg & 250 mg Capsules*

2 - CARDIOVASCULAR SYSTEM

CARDIAC GLYCOSIDES

DIGOXIN

Indications: Heart failure, supraventricular arrhythmias (particularly atrial fibrillation).
Cautions: Recent myocardial infarction, hypothyroidism; reduce dose in elderly and in renal failure; avoid hypokalaemia or hypomagnesaemia.
Note: Several drug–drug interactions; need to monitor therapeutic drug levels.
Contra-indications: Heart block, supraventricular arrhythmias caused by Wolff-Parkinson-White syndrome, ventricular tachycardia or fibrillation.
Side Effects: Usually associated with excessive dosage, include***:*** anorexia, nausea, vomiting, diarrhea and abdominal pain; visual disturbances, headache, fatigue, drowsiness, confusion, dizziness, delirium, hallucinations, depression; arrhythmias, heart block; gynecomastia with long-term use.
Dose: It has to be adjusted individually for each patient and the indicated doses are intended only as an initial guide.
By mouth, rapid digitalization, 1 – 1.5 mg in divided doses over 24 hours.
Less urgent digitalization, 125-250 mcg twice daily for up to 1 week.
Maintenance, 0.125 - 0.25 mg once daily according to renal function status.
By IV infusion, for very rapid control, digitalizing dose of 0.75 – 1.25 mg in 50 ml over 2 or more hours, followed by normal maintenance therapy. IM route not recommended, except when other methods of administration are not available.
Infants and children under 10 years, digitalization (all routes), 0.01 – 0.02 mg/kg body weight repeated six hourly until therapeutic result is obtained, usually after 2 – 4 doses.
Maintenance, 0.01 – 0.02 mg/kg body weight daily in single or divided doses.

- *Digoxin Tablets 0.25 mg, 0.0625 mg*
- *Digoxin Injection 0.5 mg/2ml*
- *Lanoxin Elixir 0.05 mg/ml*

PHOSPHODIESTERASE INHIBITORS

MILRINONE

Indications: short-term treatment of severe congestive heart failure unresponsive to conventional maintenance therapy (not immediately after myocardial infarction); acute heart failure, including low output states following heart surgery.
Cautions: heart failure associated with hypertrophic cardiomyopathy; stenotic or obstructive valvular disease; monitor blood pressure, heart rate, ECG, central venous pressure; fluid & electrolyte status; renal function; platelet count; hepatic enzymes; correct hypokalaemia, monitor renal function; renal impairment.
Side Effects: ectopic beats; less frequently ventricular tachycardia or supra ventricular arrhythmias; hypotension; headache; insomnia; nausea; vomiting; diarhhoea; chest pain, tremor, bronchospasm, anaphylaxis and rash.
Dose: by intravenous injection over 10 minutes, diluted before use, 50 mcg/kg followed by intravenous infusion at a rate of 375-750 nanograms/kg/minute, usually for up to 12 hours following surgery or for 48-72 hours in congestive heart failure; max. daily dose 1.13mg/kg.

- *Milrinone 1mg/ml. For Dilution Before Use*
- *Primacor Injection, (as lactate) 1 mg/ml,*

DIURETICS

FRUSEMIDE (FUROSEMIDE)

This is a potent loop diuretic.
Indications: pulmomary edema due to left ventricular failure; oliguria due to renal failure.
Cautions: hypotension; prosthetic enlargement; pregnancy; electrolyte imbalance, diabetes and gout.
Contra-indications: hypokalaemia, liver failure, prostatism.

Side Effects: Hypokalemia, hyponatraemia, hypomagnesimia, hyperuricemia, hyperglycemia, hypotension.
Dose: by mouth, oedema, initially 40 mg in the morning.
Maintenance, 20 mg daily or 40 mg on alternate days, increased in resistant oedema to 80 mg daily.
Oliguria, initially 250 mg over 1 hour (rate not exceeding 4mg/minute); if necessary larger doses, increasing in steps of 250 mg, may be given every 4-6 hours to a max. dose of 2 g in 24 hrs; effective dose (up to 1g) can be repeated. Every 24 hours. Child, 1-3 mg/kg daily. By intramuscular or slow intravenous injection, initially 20-50 mg. Child, 0.5-1.5 mg/kg.
By intravenous infusion, in oliguria, 0.25-1 g at a rate not exceeding 4 mg/minute.

- *Lasix Tablets 40 mg.*
- *Lasix Injection 20 mg/2ml, 250 mg/25 ml.*
- *Lasix Paediatric Syrup 1 mg/ml.*

HYDROCHLORTHIAZIDE

This is a moderately potent thiazide diuretic.
Indications: oedema, hypertension.
Cautions: monitor electrolyte serum level; impaired hepatic and renal function; pregnancy and breast-feeding.
Contra-indications: and ***Side Effects:*** ***(***same as Chlorthalidone)
Dose: oedema, initially 25-100 mg, in a single or 2 divided doses, orally given in the morning.
Maintenance, 25-50 mg on alternate days.
Max. recommended daily dose, 100 mg.
Hypertension, 25 mg daily in single or divided doses.
Dose should not exceed 50 mg a day.

- *Esidrex Tablets 25 mg*

INDAPAMIDE

This is a mild diuretic which is a vasodilator.
Indications: essential hypertension.
Cautions: avoid diuretics, liable to cause hypokalaemia; monitor plasma potassium and urate levels in the elderly, gout and in patients on digoxin, hyperparathyroidism, porphyria.

Contra-indications: severe hepatic or renal impairment
Side Effects: nausea, headache, dizziness, muscle cramps, rashes, slight weight loss; postural hypotension, hypokalemia.
Dose: 1.5 mg in the morning

- *Natrilix SR Tablets 1.5 mg*

MANNITOL

This is an osmotic diuretic
Indications: cerebral oedema, forced diuresis in cases of drug overdose.
Cautions: extravasation causes inflammation and thrombophlebitis.
Rarely used in heart failure as they may acutely expand the blood volume.
Dose: by intravenous infusion, diuresis, 50-200 g over 24 hours, preceded by a test dose of 200 mg/kg by slow intravenous injection.
Cerebral edema, 1 g/kg as a 20% solution by rapid IV infusion.

- *Mannitol IV Infusion 20% Solution*

METOLAZONE

This is a thiazide-like diuretic.
Indications: oedema, hypertension.
Cautions: serum electrolytes should be monitored to avoid fluid and/or electrolyte imbalance; may cause hypokalemia; elderly; pregnancy; concomitant use of frusemide; porphyria
Contra-indications: breast-feeding; paediatric use.
Side Effects: dizziness; headache; muscle cramps; fatigue; joint pain and swelling; chest pain; rash; pruritis; anxiety; dry mouth; impotence.
Dose: edema, 5-10mg in the morning; increased if necessary to 20 mg daily.
Max. dose, 80mg daily.
Hypertension, initially, 5mg in the morning.
Maintenance dose, 5mg on alternate day.

- *Metenix 5 mg Tablets*

SPIRONOLACTONE

This is an aldosterone antagonist, a potassium-sparing diuretic of mild to moderate potency.
Indications: oedema and ascitis in cirrhosis of the liver, nephrotic syndrome, congestive heart failure; primary hyper aldosteronism; malignant ascitis.
Cautions: breast feeding; pregnancy; hepatic and renal impairment.
Contra-indications: Hyperkalemia; hypernatremia; Addison's disease.
Side Effects: gastrointestinal disturbances, gynecomastia, menstrual irregularity, impotence; lethargy; headache; confusion; rashes; hepatotoxicity; ostoemalacia
Dose: 100-200 mg daily increased to 400 mg if required, Child, 3 mg/kg daily in divided doses.

- *Aldactone Tablets 25 mg, 100 mg*

ANTI-DYSRHYTHMIC DRUGS

ADENOSINE

Indications: rapid reversion to sinus rhythm of paroxysmal supraventricular tachycardia, including those associated with accessory pathways (e.g. Wolff-Parkinson-While syndrome); aid to diagnosis of broad or narrow complex supraventricular tachycardias.
Cautions: atrial fibrillation or flutter with accessory pathway (conduction down anomalous pathway may increase); heart transplant.
Interactions: Myocardial depression is enhanced by local anaesthetics, beta blockers, antiarrhythmic drugs, dipyridamole.
Contra-indications: second– or third- degree AV block and sick sinus syndrome (unless pacemaker fitted); asthma.
Side Effects: transient facial flush, chest pain, dyspnea, bronchospasm, choking sensation, nausea, light-headedness; severe bradycardia; ECG may show transient rhythm disturbances.
Dose: by rapid intravenous injection into central or large peripheral vein, 3 mg over 2 seconds with cardiac monitoring; if necessary followed by 6 mg after 1-2

minutes, and then by 12 mg after a further 1-2 minutes; increments should not be given if high level AV block develops.
Note: 3 mg dose ineffective in a number of patients, therefore higher initial dose sometimes used but patients with heart transplant are **very sensitive** to effects of adenosine, and should **not** receive higher initial dose.

- *Adenocor Injection, Adenosine 3mg/ml.*

AMIODARONE HYDROCHLORIDE

It is a class 3 antiarrhythmic drug.
Indications: treatment of arrhythmias when other antiarrhythmic drugs are contraindicated or ineffective; supraventricular and ventricular tachycardias, atrial fibrillation and flutter and ventricular fibrillation. Also for tachyarrhythmias associated with Wolff-Parkinson-White syndrome.
Cautions: sinus bradycardia, heart block unless pacemaker is fitted; avoid in severe conduction defects or sinus node disease, cardiomyopathy and heart failure. Liver and thyroid functions should be checked before and during long term therapy. Regular eye examination during long term therapy (Treatment should be initiated in a hospital or under specialist supervision).
Contra-indications: sinus bradycardia, sino-atrial block, thyroid dysfunction, iodine sensitivity.
Side Effects: nausea, vomiting, raised serum transaminases, jaundice, bradycardia, thyroid dysfunction, corneal opacity, photosensitivity and skin discolouration; circulatory collapse can occur with rapid IV injection.
Dose: by mouth, 200 mg 3 times daily for 1 week reduced to 200 mg twice daily for a further week. Maintenance, usually 200 mg daily or the minimum required to control the arrhythmias.
By l.V. infusion via central catheter, up to 5 mg/kg over 20-120 minutes with ECG and blood pressure monitoring; max. 1.2 g in 24 hours.

- *Cordarone Tablets 200 mg.*
- *Cordarone Injection 50 mg/ml - 3 ml Ampoules.*

ATROPINE SULPHATE

It is an antimuscarinic (anticholinergic) drug
Indications: bradycardia after myocardial infarction particularly if complicated by hypotension; bradycardia caused by beta-adrenoceptor blocking drugs. (Also used as a preanaesthetic medication, and an antidote for organophosphate poisoning).
Cautions: glaucoma, paralytic ileus, enlarged prostate.
Dose: by intravenous injection, 0.3-1 mg repeated if the initial dose is ineffective. Max. 3mg in 24 hours.

- *Atropine Injection 600 mcg/ml Ampoules..*

LIDOCAINE HYDROCHLORIDE (LIGNOCAINE)

It is a class 1 antiarrhythmic drug (subgroup 1 A)
Indications: ventricular arrhythmias, especially after myocardial infarction. (Also used as a local anaesthetic).
Cautions: lower dose in congestive cardiac failure, and following cardiac surgery; in elderly and in hepatic and renal impairment.
Contra-indications: sino-atrial disorders, all grades of AV block; severe myocardial depression; porphyria
Side Effects: dizziness; parasthesia or drowsiness; CNS effects like confusion, respiratory depression & convulsions; hypotension and bradycardia; rarely anaphylaxis.
Dose: by IV injection, in patients without gross circulatory impairment, 100 mg as a bolus over a few minutes as a loading dose, followed by infusion of 4 mg/minute for 30 minutes, 2 mg/minute for 2 hours, then 1 mg/minute; reduce infusion rate if infusion is continued beyond 24 hours. ECG monitoring is required.

- *Lidocaine Hydrochloride Injection 2%, 20 mg/ml*
- *Lidocaine 2% Minijet*

PHENYTOIN SODIUM

It is a class 1 antiarrhythmic drug (subgroup 1 A)
Indications: ventricular arrhythmias, particularly those caused by cardiac glycosides, but this use is now unknown. (Also used for seizure disorders)
Cautions: do not give with lignocaine hydrochloride.

Dose: by slow intravenous injection via central catheter***:*** 3.5-5 mg/kg at a rate not exceeding 50 mg/minute. Monitor the blood pressure and ECG.
Repeat after 10 minutes if necessary.

- *Epanutin Injection 50 mg/ml Ampoules*

PROPAFENONE HYDROCHLORIDE

It is a class 1 antiarrhythmic drug (subgroup 1 C)
Indications: paroxysmal supraventricular tachyarrhythmias including atrial flutter or fibrillation and re-entrant tachycardias; ventricular arrhythmias.
Cautions: pacemaker patients; pregnancy and breast-feeding; obstructive airway disease; heart failure; myasthenia gravis and in elderly.
Contra-indications: uncontrolled congestive heart failure, cardiogenic shock, and in severe electrolyte disturbances.
Side Effects: bradycardia and conduction disturbances; arrhythmias, nausea and vomiting, constipation; parasthesias, disturbances of vision and vertigo; rarely hypersensitivity reactions.
Dose: In patients with a body weight in excess of 70kg, initial dose 150 mg 3 times daily after food. The dose should be adjusted for patients weighing less than 70kg.

- *Rytomonorm Tablets 150 mg*

BETA-ADRENOCEPTOR BLOCKING DRUGS

ATENOLOL

Indications: hypertension, angina, arrhythmias, early intervention in acute myocardial infarction.
Cautions, contra-Indications and Side Effects: same as propranolol; reduce dose in renal failure.
Dose: by mouth, hypertension, 50-100 mg daily.
Angina, 100 mg daily in 1 or 2 doses.
Arrhythmias, 50-100 mg daily.

- *Tenormin 50 mg Tablets*
- *Tenormin 25mg/5ml Syrup*

BISOPROLOL FUMARATE

Indications: hypertension, angina and as an adjunct in heart failure.

Cautions, contra-Indications and Side Effects: *(*see under Propranolol Hydrochloride); in heart failure monitor clinical status for 4 hours after initiation (with low dose) and ensure heart failure not worsening before increasing each dose; psoriasis; hepatic impairment.
Contra-indications: (see under Propranolol Hydrochloride); acute or decompensated heart failure requiring intravenous inotropes; sino-atrial block.
Side Effects: *(*see under Propranolol Hydrochloride)
Dose: hypertension and angina, usually 10 mg once daily (5mg may be adequate in some patients); max. 20 mg daily.
Adjunct in stable moderate to severe heart failure, initially 1.25 mg once daily in the morning for 1 week, then, if well tolerated, increased to 2.5 mg once daily for 1 week, then 3.75 mg once daily for 1 week, then 5 mg once daily for 4 weeks, then 7.5mg once daily for 4 weeks, then 10 mg once daily; max. 10 mg daily.

- *Concor Tablets 2.5mg, 5mg*

CARVEDILOL

Indications: hypertension; angina; adjunct to diuretics, digoxin or ACE-inhibitors in symptomatic chronic heart failure.
Cautions: unstable angina; reduced performance of the heart; recent heart attack; impaired renal function. (see Propranolol).
Contra-indications: severe chronic heart failure, constrictive respiratory tract diseases; allergic rhinitis (see Propranolol).
Side Effects: postural hypotension, dizziness, headache, GI disturbances, bradycardia; occasionally diminished peripheral circulation; peripheral oedema, and painful extremities; dry mouth, dry eyes, eye irritation, or disturbed vision; impotence, disturbances of micturition, influenza like symptoms, rarely angina, AV block, exacerbation of intermittent claudification or Raynaud's phenomenon; allergic skin reactions, exacerbation of psoriasis; nasal stuffiness, wheezing, depressed mood, sleep disturbances, paraesthesia, heart failure, changes in liver enzymes; thrombocytopenia, leucopenia.
Dose: hypertension, initially 12.5 mg once daily increased after 2 days to 25 mg once daily. Max. daily

dose is 50 mg. Elderly may require much lower dosage, usually 12.5mg once daily.
Angina, initially 12.5 mg twice daily increased after 2 days up to 25 mg twice daily.
Heart failure, initially 3.125 mg twice daily increased at intervals of 2 weeks to 6.25 mg twice daily then 25 mg twice daily.
Max. 50 mg twice daily in patients over 85 kg body weight.

- *Dilatrend Tablets 6.25 mg & 25 mg*

ESMOLOL HYDROCHLORIDE

Indications: supraventricular tachycardia including atrial fibrillation, atrial flutter and sinus tachycardia; intraoperative and post-operative tachycardia and/or hypertension.
Cautions, contra-Indications & Side Effects: symptomatic hypotension at any dose; cardiac failure; patients with hypertension due to vasoconstriction associated with hypothermia; diabetes and hypoglycaemia (Also see propranolol).
Dose: supraventricular tachycardia, initiate treatment with a loading dose of 500 mcg/kg/min over 1-minute followed by a 4-minute maintenance infusion of 50 mcg/kg/min. Usual dosage within range 50-200 mcg/kg/minute.

- *Brevibloc Injection 2.5 g/250 ml, 100 mg/10ml*

LABETALOL HYDROCHLORIDE

Indications: hypertension (including hypertension in pregnancy, hypertension with angina, and hypertension following acute myocardial infarction); hypertensive crisis; controlled hypotension in anaesthesia.
Cautions and Contra-indications: (see Propranolol Hydrochloride); interferes with laboratory tests for catecholamines; severe hepatocellular damage. Appropriate laboratory testing needed at first symptom of liver dysfunction and if laboratory evidence of damage (or if jaundice) occurs, labetalol should be stopped and not restarted.
Side Effects: postural hypotension (avoid upright position during and for 3 hours after intravenous

administration), tiredness, weakness, headache, rashes, scalp tingling, difficulty in micturition, epigastric pain, nausea, vomiting; liver damage; rarely lichenoid rash.
Dose: *by mouth*, initially 100 mg (50mg in elderly) twice daily with food, increased at intervals of 14 days to usual dose of 200 mg twice daily; up to 800 mg daily in 2 divided doses (3-4 divided doses if higher); max. 2-4 g daily.
By intravenous injection, 50 mg over at least 1 minute, repeated after 5 minutes if necessary; max. total dose 200mg.
Note: Excessive bradycardia can be countered with intravenous injection of atropine sulphate 0.6 – 2.4 mg in divided dose of 600 mcg.
By intravenous infusion, 2 mg/minute until satisfactory response then discontinue; usual total dose 50-200 mg (not recommended for phaeochromocytoma)
Hypertension of pregnancy, 20 mg/hour, doubled every 30 minutes; usual max. dose 160 mg/hour.
Hypertension following myocardial infarction, 15 mg/hour, gradually increased to max. 120 mg/hour.

- *Labetalol Hydrochloride Injection 5mg/ml.*

METOPROLOL TARTRATE

Indications: hypertension, Prophylaxis of variceal bleeding in portal hypertension, Phaeochromocytoma, Angina, Arrhythmias, hypertrophic cardiomyopathy, anxiety tachycardia, and thyrotoxicosis (adjunct), Anxiety with symptoms such as palpitation, sweating, tremor, Prophylaxis after myocardial infarction, Essential tremor, Migraine prophylaxis, arrhythmias and thyrotoxic crisis.
Cautions: avoid abrupt withdrawal especially in ischaemic heart disease; first-degree AV block; portal hypertension (risk of deterioration in liver function); diabetes; history of obstructive airways disease (introduce cautiously and monitor lung function); myasthenia gravis; symptoms of hypoglycaemia and thyrotoxicosis may be masked, Psoriasis; history of hypersensitivity—may increase sensitivity to allergens and result in more serious hypersensitivity response, also may reduce response to adrenaline (epinephrine) ; verapamil

Contra-indications: asthma, uncontrolled heart failure, Prinzmetal's angina, marked bradycardia, hypotension, sick sinus syndrome, second- or third- degree AV block, cardiogenic shock, metabolic acidosis, severe peripheral arterial disease; phaeochromocytoma,
Bronchospasm Beta-blockers, including those considered to be cardioselective, should usually be avoided in patients with a history of asthma or bronchospasm. However, when there is no alternative, a cardioselective beta-blocker can be given to these patients with caution and under specialist supervision.
Hepatic impairment: reduce oral dose
Renal impairment: manufacturer advises caution—dose reduction may be required
Side Effects: gastro-intestinal disturbances; bradycardia, heart failure, hypotension, conduction disorders, peripheral vasoconstriction (including exacerbation of intermittent claudication and Raynaud's phenomenon); bronchospasm, dyspnea; headache, fatigue, sleep disturbances, paraesthesia, dizziness, vertigo, psychoses; sexual dysfunction; purpura, thrombocytopenia; visual disturbances; exacerbation of PSORIASIS, alopecia; rarely rashes and dry eyes (reversible on withdrawal);
Dose: By mouth, hypertension, initially 100 mg daily, increased if necessary to 200 mg daily in 1–2 divided doses; max. 400 mg daily (but high doses rarely necessary)
Angina, 50–100 mg 2–3 times daily
Arrhythmias, usually 50 mg 2–3 times daily; up to 300 mg daily in divided doses if necessary
Migraine prophylaxis, 100–200 mg daily in divided doses
Hyperthyroidism (adjunct), 50 mg 4 times daily
By intravenous injection, arrhythmias, up to 5 mg at rate 1–2 mg/minute, repeated after 5 minutes if necessary, total dose 10–15 mg
Note : Excessive bradycardia can be countered with intravenous injection of atropine sulfate 0.6–2.4 mg in divided doses of 600 micrograms; for overdosage.
In surgery, by slow intravenous injection 2–4 mg at induction or to control arrhythmias developing during anaesthesia; 2-mg doses may be repeated to a max. of 10 mg

Early intervention within 12 hours of infarction, by intravenous injection 5 mg every 2 minutes to a max. of 15 mg, followed after 15 minutes by 50 mg by mouth every 6 hours for 48 hours; maintenance 200 mg daily in divided doses.

- *Lopressor Tablets 100 mg.*
- *Betaloc Injection, metoprolol tartrate 1 mg/ml*

PROPRANOLOL HYDROCHLORIDE

Indications: Hypertension, angina, arrhythmias, thyrotoxicosis, secondary prevention after acute myocardial infarction, migraine, and in phaeochromocytoma along with an alpha blocker.
Cautions: first degree AV block; portal hypertension and chronic obstructive pulmonary disease; late pregnancy; breast feeding; avoid abrupt withdrawal in angina; reduce oral dose of propranolol in liver disease; reduce initial dose in renal impairment; a small dose should be used initially in elderly patients; can mask signs and symptoms of hypoglycemia in patients receiving insulin therapy.
Contra-indications: Asthma; uncontrolled heart failure; Prinzmetals's angina; marked bradycardia; hypotension; sick sinus syndrome; second or third degree AV block; cardiogenic shock; metabolic acidosis; severe peripheral arterial disease; phaeochromocytoma (apart from specific use with alpha blockers).
Side Effects: Gastro intestinal disturbances; bradycardia, heart failure, hypotension, conduction disorders, bronchospasm, peripheral vasoconstriction (exacerbation of intermittent claudification or Raynaud's phenomenon); dyspnea; headache, fatigue, sleep disturbances, paraesthesia, dizziness, vertigo, psychoses; sexual dysfunctions; purpura; thrombocytopenia, disturbed vision, exacerbation of psoriasis. alopecia, rarely rashes, dry eyes (reversible on withdrawal).
Dose: by mouth, hypertension, initially 80 mg twice daily.
Maintenance, 160-320 mg daily.
Angina, initially 40 mg 2-3 times daily.
Maintenance, 120-240 mg daily.
Arrhythmias and thyrotoxicosis, 10-40 mg 3-4 times daily.

Prophylaxis after infarction, 40 mg 4 times daily for 2-3 days, then 80 mg twice daily, beginning 5-21 days after infarction.
Migraine prophylaxis and essential tremor, initially 40 mg 2-3 times daily.
Maintenance, 80-160 mg daily.
By IV injection, arrhythmias and thyrotoxic crisis, 1 mg over 1minute, preceded by atropine sulphate 1-2 mg in divided doses. If necessary, repeat at 2 minute intervals; max. dose 10 mg (5 mg in anaesthesia).

- *Inderal Tablets 10 mg, 40 mg*
- *Inderal Injection 1mg/ml*

ANTI-HYPERTENSIVE DRUGS

ACE INHIBITORS

Indications: hypertension; congestive heart failure as an adjuvant therapy.
Cautions: ACE inhibitors need to be initiated with care in patients receiving diuretics; first doses can cause hypotension especially in patients taking high doses of diuretics, on a low-sodium diet, on dialysis, dehydrated, or with heart failure. They should also be used with caution in peripheral vascular disease or generalised atherosclerosis owing to risk of clinically silent renovascular disease; for use in pre-existing renovascular disease. The risk of agranulocytosis is possibly increased in collagen vascular disease (blood counts recommended). ACE inhibitors should be used with care in patients with severe or symptomatic aortic stenosis (risk of hypotension) and in hypertrophic cardiomyopathy. They should also be used with care (or avoided) in those with a history of idiopathic or hereditary angioedema. If jaundice or marked elevations of hepatic enzymes occur during treatment then the ACE inhibitor should be discontinued— risk of hepatic necrosis.
Contra-indications: ACE hypersensitivity to ACE-inhibitors, and in renovascular disease; pregnancy.
Side Effects: profound hypotension and renal impairment, especially when treatment is begun. ACE-inhibitors can produce persistent dry cough, hypersensitivity, pancreatitis, rhinitis, and sore throat.

Gastrointestinal adverse effects and abnormal liver function tests, cholestatic jaundice and hepatitis have also been reported. Other rare adverse effects reported are paresthesias, alterations in taste, dizziness, fatigue, vasculitis, myalgia, positive antinuclear antibodies, raised erythrocyte sedimentation rate, leukocytosis and photosensitivity.

CAPTOPRIL

Captopril is an angiotensin-converting enzyme (ACE) inhibitor.

Indications: mild to moderate hypertension as an adjunct to thiazide therapy; severe hypertension resistant to other treatment; adjunct treatment in severe congestive heart failure.

Cautions, contra-Indications and Side Effects: (see ACE-inhibitors) Also tachycardia, serum sickness, weight loss, stomatitis, maculopapular rash photosensitivity, flushing, acidosis.

Dose: *Alone* mild to moderate hypertension, initially 12.5 mg twice daily.

Maintenance dose, 25 mg twice daily; can be increased at 2-4 week intervals until a satisfactory response is obtained to a max. of 50 mg twice daily.

A thiazide diuretic may be added; its dose is increased at 1-2 week intervals until optimum response is obtained or until max. dose is reached.

Severe hypertension, starting dose is 12.5 mg twice daily increased to a max. of 50 mg three times daily. A dose of 150 mg daily should not normally be exceeded. Other antihypertensive can be used but their doses are individual.

Heart failure, a starting dose of 6.25 or 12.5 mg.

Usual maintenance dose is 25 mg two or three times daily.

Usual max. dose is 150 mg daily.

Diabetic nephropathy, 75-100 mg daily in divided doses.

Child, initially 0.3 mg/kg (0.15 mg/kg if a diuretic is given) 3 times daily; may be increased to a max. dose of 6 mg/kg body weight in divided doses. This dose should not be exceeded.

The drug is not recommended in mild to moderate hypertension in children.

- *Capoten Tablets 12.5 mg.*

ENALAPRIL MALEATE

This is an angiotensin-converting enzyme inhibitor.
Indications: all grades of essential hypertension and renovascular hypertension where standard therapy ineffective or inappropriate; congestive heart failure (adjunct).
Cautions: ***(***See ACE-inhibitors); severe hepatic impairment.
Contra-indications: (See ACE-inhibitors)
Side Effects: ***(***See ACE-inhibitors); dyspnea, asthenia, blurred vision,. Less commonly dry mouth, peptic ulcer, anorexia, ileus, arrhythmias, palpitation, flushing, confusion nervousness, drowsiness, insomnia, vertigo etc..
Dose: hypertension, used alone initially 5 mg daily; used in addition to a diuretic, in elderly patients, or in renal impairment, initially 2.5 mg daily; usual maintenance dose 10-20 mg daily; max. 40 mg daily. Heart failure, with a diuretic, dose initially, 2.5 mg daily under close hospital supervision. Usual maintenance dose, 10-20 mg daily in 1-2 divided doses.

- *Renitec Tablets 10 mg.*

PERINDOPRIL

This is an angiotensin-converting enzyme inhibitor.
Indications: hypertension; congestive heart failure in association, or not, with diuretic, with or without digitalis.
Cautions: ***(***See ACE-inhibitors); severe hepatic impairment.
Contra-indications: (See ACE-inhibitors)
Side Effects: ***(***See ACE-inhibitors); asthenia, mood and sleep disturbances.
Renal impairment: ; max. initial dose 2.5mg once daily if eGFR 30–60 ml/minute/1.73m^2; 2.5mg once daily on alternate days if eGFR 15–30 ml/minute/1.73m^2
Dose Hypertension, initially 5mg once daily in the morning for 1 month, subsequently adjusted according to response; if used in addition to diuretic, in elderly, in renal impairment, in cardiac decompensation, or in volume depletion, initially 2.5mg once daily; max. 10mg daily. Heart failure (adjunct), initially 2.5mg once daily in

the morning under close medical supervision, increased after 2 weeks to max. 5mg once daily if tolerated. Following myocardial infarction or revascularisation, initially 5mg once daily in the morning increased after 2 weeks to 10mg once daily if tolerated; ELDERLY 2.5mg once daily for 1 week, then 5mg once daily for 1 week, thereafter increased to 10mg once daily if tolerated

- *Coversyl Tablets 5 mg*
- *Bipreterax (Perindopril 5 mg + Indapamide 1.25 mg)*
- *Coveram 5/5 (Perindopril 5 mg + Amlodipine 5 mg))*
- *Perindopril arginine with Amlodipine)*

Note : *For hypertension not adequately controlled by perindopril alone*

RAMIPRIL

Indications: hypertension; symptomatic heart failure following myocardial infarction in patients with clinical evidence of heart failure; prevention of cardiovascular events in patients with atherosclerotic cardiovascular disease or with diabetes mellitus and at least one additional risk factor for cardiovascular disease; nephropathy.
Cautions: see ACE Inhibitors
Contra-indications: see ACE Inhibitors
Hepatic impairment: max. daily dose 2.5 mg.
Renal impairment: ; max. daily dose 5 mg if eGFR 30–60 ml/minute/1.73 m^2; max. initial dose 1.25 mg once daily (do not exceed 5 mg daily) if eGFR less than 30 ml/minute/1.73 m^2
Side Effects: stomatitis, syncope, dyspnea, bronchitis, muscle cramps; less commonly dry mouth, arrhythmias, tachycardia, palpitations, angina, chest pain, myocardial infarction, peripheral oedema, flushing, loss of appetite, nervousness, depression, anxiety, impotence, decreased libido, visual disturbances, sweating; *rarely* confusion, tremor, conjunctivitis, impaired hearing, tinnitus, onycholysis; *also reported* cerebrovascular accident, precipitation or exacerbation of Raynaud's syndrome, sleep disturbance, gynaecomastia, hyponatraemia, skin reactions including erythema multiforme, pemphigoid

exanthema, Stevens-Johnson syndrome, and toxic epidermal necrolysis, alopecia

Dose: Hypertension, initially 1.25–2.5 mg once daily, increased at intervals of 2–4 weeks to max. 10 mg once daily; if used in addition to diuretic

- Heart failure (adjunct), initially 1.25 mg once daily under close medical supervision, increased gradually at intervals of 1–2 weeks to max. 10 mg daily if tolerated (preferably taken in 2 divided doses)

-Prophylaxis after myocardial infarction (started at least 48 hours after infarction), initially 2.5 mg twice daily, increased after 3 days to 5 mg twice daily

Note: If initial 2.5-mg dose not tolerated, give 1.25 mg twice daily for 2 days before increasing to 2.5 mg twice daily, then 5 mg twice daily; withdraw if dose cannot be increased to 2.5 mg twice daily

Prophylaxis of cardiovascular events, initially 2.5 mg once daily, increased after 1–2 weeks to 5 mg once daily, then increased after a further 2–3 weeks to 10 mg once daily

Nephropathy, initially 1.25 mg once daily, increased after 2 weeks to 2.5 mg once daily, then increased after a further 2 weeks to 5 mg once daily if tolerated

- *Tritace Tablets 5mg, 10mg*

ANGIOTENSIN II RECEPTOR ANTAGONISTS

These are angiotensin-II receptor antagonists with many properties similar to those of the ACE inhibitors. However, unlike ACE inhibitors, they do not inhibit the breakdown of bradykinin and other kinins, and thus are less likely to cause the persistent dry cough which can complicate ACE inhibitor therapy. They are therefore a useful alternative for patients who have to discontinue an ACE inhibitor because of persistent cough. An angiotensin-II receptor antagonist may be used as an alternative to an ACE inhibitor in the management of heart failure or diabetic nephropathy.

Cautions Angiotensin-II receptor antagonists should be used with caution in renal artery stenosis Monitoring of plasma-potassium concentration is advised, particularly in the elderly and in patients with renal impairment; lower initial doses may be appropriate in these patients. Angiotensin-II receptor antagonists should be used with

caution in aortic or mitral valve stenosis and in hypertrophic cardiomyopathy. Those with primary aldosteronism, and Afro-Caribbean patients (particularly those with left ventricular hypertrophy), may not benefit from an angiotensin-II receptor antagonist.
Pregnancy: Angiotensin-II receptor antagonists should be avoided in pregnancy unless essential. They may adversely affect fetal and neonatal blood pressure control and renal function; skull defects and oligohydramnios have also been reported.
Breast-feeding: Information on the use of angiotensin-II receptor antagonists in breast-feeding***:*** is limited. They are not recommended in breast-feeding***:*** and alternative treatment options, with better established safety information during breast-feeding, are available.
Side Effects: are usually mild. Symptomatic hypotension including dizziness may occur, particularly in patients with intravascular volume depletion (e.g. those taking high-dose diuretics). Hyperkalaemia occurs occasionally; angioedema has also been reported with some angiotensin-II receptor antagonists.

IRBESARTAN

Indications: hypertension including left ventricular hypertrophy; renal disease in hypertensive type 2 diabetes mellitus.
Cautions: renal artery stenosis; aortic or mitral valve stenosis and obstructive hypertrophic cardiomyopathy.
Contra-indications: breastfeeding, intravascular volume depletion.
Side Effects: nausea, vomiting; fatigue; musculoskeletal pain; diarrhoea, dyspepsia, flushing, tachycardia, chest pain, cough and sexual dysfunction; dizziness; orthostatic effects; rash; angioedema.
Dose: hypertension and in renal disease in hypertensive type 2 diabetes mellitus***:*** initially 150 mg once daily, increased if necessary to 300 mg once daily.
In haemodialysis or in elderly over 75 years, initial dose of 75 mg once daily may be used.

- *Aprovel Tablets 150 mg*
- *Co-Aprovel Tablets 150 mg, 300 mg. Irbesartan150mg* or *300mg + Hydrochlorthiazide 12.5mg*

VALSARTAN

Indications: hypertension; myocardial infarction with left ventricular failure or left ventricular systolic dysfunction.
Cautions: *(*See Irbesartan) also mild to moderate hepatic impairment; renal impairment.
Contra-indications: severe hepatic impairment, cirrhosis, biliary obstruction, breastfeeding.
Side Effects: fatigue, rarely diarrhea, headache, epistaxis; thrombocytopenia, arthralgia, myalgia, taste disturbance, neutropenia & rash.
Dose: hypertension, usually 80 mg once daily; in elderly over 75 years, mild to moderate hepatic impairment, moderate to severe renal impairment, intravascular volume depletion, initially 40 mg once daily; if necessary increased after at least 4 weeks to 160 mg daily. Myocardial infarction, initially 20 mg twice daily increased over several weeks to 160 mg twice daily if tolerated; consider lower dose in mild to moderate hepatic impairment.

- *Diovan 80 mg, & 160 mg Tablets*
- *Co-Diovan Tablets With Diuretic (**Note:** For Hypertension Not Adequately Controlled By Valsartan Alone).*
- *Valsartan 80 mg, Hydrochlorothiazide 12.5 mg*
- *Valsartan 160 mg, Hydrochlorothiazide 12.5 mg*

CENTRAL ANTIHYPERTENSIVE DRUGS

METHYLDOPA

This is a centrally acting anti-hypertensive drug.
Indications: moderate to severe hypertension in conjunction with a diuretic; pregnancy-induced hypertension.
Cautions: positive direct Coomb's test in 20% of patients; interference with laboratory tests; reduce initial dose in renal impairment; blood counts and liver function tests advised.
Contra-indications: history of depression; liver disease, phaeochromocytoma, porphyria.
Side Effects: gastrointestinal disturbances; dry mouth; stomatitis, sialdenitis, bradycardia, exacerbation of

angina, postural hypotension, edema, sedation, depression, dizziness, myalgia, nightmares, abnormal liver function tests, hepatitis, jaundice, pancreatitis, haemolytic anemia, leucopenia, thrombocytopenia, eosinophilia, nasal congestion, sexual dysfunction, amenorrhea, hyperprolactinemia.
Dose: by mouth, 250 mg 3 times daily gradually increased; max. dose 3 g daily; In elderly, 125 mg 2 times daily increased to max. of 2 gm daily.

- *Aldomet Tablets 250 mg*

ALPHA BLOCKERS

PRAZOSIN

This is a drug with post-synaptic alpha-blocking and vasodilator properties.
Indications: hypertension, congestive heart failure, Raynaud's syndrome; benign prostatic hyperplasia.
Cautions: first dose may cause collapse due to hypotension; reduce initial dose in renal failure. Avoid abrupt withdrawal in heart failure.
Contra-indications: congestive heart failure due to mechanical block (e.g. aortic stenosis)
Side Effects: postural hypotension, drowsiness, weakness, dizziness, headache, lack of energy; nausea, palpitation, urinary frequency; incontinence & priapism reported.
Dose: hypertension, 500 mcg 2-3 times daily, the initial dose being taken on retiring to bed at night; increased to 1 mg 2-3 times daily for a further 3- 7 days; further increased to a max. of 20 mg daily in divided doses.
Congestive heart failure, 500 mcg 2-4 times daily, initially then 1 mg 3-4 times daily; maintenance 4-20 mg daily in divided doses (rarely used).
Raynaud's syndrome, initially 500 mcg twice daily Maintenance 1-2 mg twice daily.
Benign prostatic hypertrophy, initially 500 mcg twice daily for 3-7 days (initial dose at bedtime, as for above), dose subsequently adjusted according to response; usual maintenance (and max.) 2 mg twice daily.

- *Minipres Tablets 5 mg*

TOLAZOLINE HYDROCHLORIDE

This is a vasodilator with some alpha adrenergic blocking properties.

Indications: reduction of pulmonary artery pressure in persistent pulmonary hypertension in new-born infants with persistent foetal circulation.

Cautions: coronary artery disease, hypotension, after cerebrovascular accident; peptic ulceration; mitral stenosis.

Side Effects: pilo-erection, headache, flushing, tachycardia, cardiac arrhythmias, tingling, shivering, sweating, nausea, vomiting, diarrhoea, and epigastric pain; orthostatic hypotension or marked hypertension; blood dyscrasias; may cause disulfiram-like reaction if given with alcohol; hypochloraemic metabolic alkalosis, acute renal failure and duodenal perforations have been reported in infants given tolazoline.

Dose: adults, subcutaneously, intra-muscularly, intravenously or by slow intra-arterial injection, up to 50 mg.

Infants, 1 to 2 mg/kg body weight over 10 minutes by intravenous infusion followed by 1 to 2 mg per kg per hour thereafter.

- *Priscol Injection 25 mg/ml & 4 ml Ampoules.*

CALCIUM CHANNEL BLOCKERS

AMLODIPINE

This is a calcium-channel blocker.

Indications: hypertension; prophylaxis of angina.

Cautions: severe liver impairment, pregnancy and breastfeeding.

Contra-indications: cardiogenic shock, unstable angina, aortic stenosis, breast feeding.

Side Effects: headache, oedema, dizziness, fatigue, flushing, nausea palpitations, sleep disturbances..

Dose: 5 mg once daily, may be increased to 10 mg once daily.

- *Norvasc Cap 5mg*
- *Amlodipine With valsartan*
- *Exforge Tablets 5/80, amlodipine 5 mg, valsartan80 mg,*

- *Exforge Tablets 5/160, amlodipine 5 mg, valsartan 160 mg*
- *Exforge Tablets 10/160, f/c, light yellow, amlodipine 10 mg, valsartan 160 mg*

DILTIAZEM HYDROCHLORIDE

This is a calcium-channel blocker.
Indications: prophylaxis and treatment of angina, hypertension.
Cautions: reduce dose in hepatic and renal impairment; heart failure or significantly impaired left ventricular function; bradycardia; first degree AV block or prolonged PR interval.
Contra-indications: severe bradycardia, second or third degree A-V block (unless pacemaker is fitted), sick sinus syndrome, pregnancy; porphyria.
Side Effects: bradycardia and first- degree heart block, hypotension, palpitations, ankle oedema, headache, nausea, rarely rashes (toxic erythema reported), gum hyperplasia and extrapyramidal symptoms have been reported.
Dose: initially 60 mg 3 times daily (elderly patients twice daily), max 360 mg daily.

- *Delzim Tablet 60mg*
- *Delzim-200mg Cap*

FELODIPINE

This is a calcium-channel blocker
Indications: hypertension; prophylaxis of angina pectoris.
Cautions: may precipitate hypotension which in susceptible individuals may result in myocardial ischaemia. Withdraw if ischemic pain occur or existing pain worsens after initiating treatment; avoid grape fruit juice.
Contra-indications: unstable angina, uncontrolled heart failure, recent myocardial infarction within past month; pregnancy; hypersensitivity.
Side Effects: flushing, headache, palpitations, dizziness and fatigue; ankle edema; rarely gum hyperplasia, urinary frequency, and impotence.

Dose: hypertension, initially, 5 mg once daily (elderly 2.5 mg).
Maintenance, 5-10 mg once daily.
Angina pectoris, initially 5 mg once daily increased to 10 mg once daily if needed.

- *Plendil Tablets 5 mg*

NIFEDIPINE

This is a calcium-channel blocker.
Indications: treatment and prophylaxis of angina pectoris (exercise-induced angina, angina at rest and angina following myocardial infarction), and in the treatment of hypertension; Raynaud's phenomenon.
Cautions: withdraw the drug if ischaemic pain occurs or existing pain worsens shortly after initiating treatment; may inhibit labour. Systolic blood pressure of less than 90 mm Hg; dialysis patients with malignant hypertension and irreversible renal failure with hypovolaemia; avoid grape-fruit juice.
Contra-indications: cardiogenic shock; pregnancy and breast-feeding; within one month of myocardial infarction; unstable or acute attacks of angina; advanced aortic stenosis; porphyria.
Side Effects: headache, flushing, nausea, dizziness, lethargy, skin reactions, paraesthesia, hypotension, palpitation, tachycardia and dependent oedema; rarely hepatitis and reversible gingival hyperplasia.
Dose: angina, initially 10 mg 3 times daily with food, increased to 20 mg 3 times daily if necessary. In elderly patients, initially 5 mg 3 times daily.
For immediate effect bite into capsule and retain liquid in mouth.
Raynaud's syndrome, 10 mg 3 times daily; max. 60 mg daily.
For sustained release capsules***:*** angina pectoris, and hypertension, normally one capsule (20 mg) every 12 hours if necessary the dosage may be increased to 2 capsules every 12 hours.
The capsule should be swallowed whole with a little fluid after meals.

- *Adalat 10 mg Tablets*
- *Adalat La Tablet 30 mg*

VERAPAMIL HYDROCHLORIDE

This is a calcium-channel blocker

Indications: mild to moderate hypertension; treatment and prophylaxis of chronic stable angina, vasospastic angina and unstable angina; paroxysmal supraventricular tachycardia; reduction of ventricular rate in atrial flutter/fibrillation.

Cautions: first-degree AV block; acute myocardial infarction complicated by bradycardia; concomitant use of beta-blockers; pregnancy and breast-feeding; grapefruit juice ingestion.

Contra-indications: second-and third- degree AV block; sino-artial block; uncompensated heart failure; bradycardia; porphyria; atrial flutter or fibrillation complicating Wolff-Parkinson-White syndrome.

Side Effects: constipation; flushing; headache; nausea and vomiting; allergic reactions.

Dose: by mouth, supraventricular, tachycardias, 40-120 mg 3 times daily.

Angina, 80-120 mg 3 times daily. Hypertension, 240-480 mg daily in 2-3 divided doses. By slow IV injection over 2 minutes, 5-10 mg with ECG monitoring.

In paroxysmal tachyarrhythmias a further 5 mg after 5-10 minutes if required.

- *Isoptin Tablets 40 mg*
- *Isoptin S.R. Tablets 240 mg*
- *Isoptin Injection 5 mg/2ml*

VASODILATORS

BOSENTAN

Indications: pulmonary arterial hypertension; systemic sclerosis with ongoing digital ulcer disease (to reduce number of new digital ulcers)

Cautions: not to be initiated if systemic systolic blood pressure is below 85 mmHg; monitor haemoglobin before and during treatment (monthly for first 4 months, then 3-monthly); avoid abrupt withdrawal; monitor liver function before treatment, at monthly intervals during treatment, and 2 weeks after dose increase (reduce dose or suspend treatment if liver enzymes raised

significantly)—discontinue if symptoms of liver impairment
Contra-indications: acute porphyria
Hepatic impairment: avoid in moderate and severe impairment
Pregnancy: avoid (teratogenic in *animal* studies); effective contraception required during administration (hormonal contraception not considered effective); monthly pregnancy tests advised
Breast feeding: manufacturer advises avoid—no information available
Side Effects: diarrhoea, gastro-oesophageal reflux, flushing, hypotension, palpitation, oedema, syncope, headache, anaemia; less commonly thrombocytopenia, neutropenia, leucopenia; *rarely* liver cirrhosis, liver failure (see cautions above)
Dose: Pulmonary arterial hypertension, initially 62.5 mg twice daily increased after 4 weeks to 125 mg twice daily; max. 250 mg twice daily
Systemic sclerosis with ongoing digital ulcer disease, initially 62.5 mg twice daily increased after 4 weeks to 125 mg twice daily

- *Tracleer Tablets 125mg*

HYDRALAZINE HYDROCHLORIDE

This is a vasodilator antihypertensive.
Indications: moderate to severe hypertension, in addition to a beta-adrenoceptor blocker or diuretics; hypertensive crisis.
Cautions: reduce initial dose in renal impairment; excessive reduction in blood pressure can occur with even low IV doses; may provoke angina in patients with coronary artery disease.
Contra-indications: porphyria, severe tachycardia, high output heart failure and cor pulmonale, systemic lupus erythematosus.
Side Effects: tachycardia, palpitation, flushing, hypotension, fluid retention, GI disturbances; headache, dizziness, systemic lupus erythematosus like syndrome with long term therapy with over 100 mg daily dose.
Dose: by mouth, 25 mg twice daily increased to max. of 50 mg twice daily.

By slow IV injection, 5-20 mg over 20 minutes; may be repeated after 20-30 minutes. By IV infusion, 20 mg repeated if necessary.

- *Apresoline Tablets 25 mg*
- *Apresoline Injection 20 mg/Ampoule*

PERIPHERAL VASODILATORS

CILOSTAZOL

Indications: intermittent claudication in patients without rest pain and no peripheral tissue necrosis
Cautions: atrial or ventricular ectopy, atrial fibrillation, atrial flutter (contra-indicated if severe); stable coronary disease; diabetes mellitus (higher risk of intra-ocular bleeding); surgery; concomitant drugs that increase risk of bleeding (contra-indicated with concomitant use of 2 or more antiplatelets or anticoagulants)
Note: Blood disorders Patients should be advised to report any unexplained bleeding, bruising, sore throat, or fever. A blood count should be performed and the drug stopped immediately if there is suspicion of a blood dyscrrs. Patients should be advised to report any unexplained bleeding, bruising, sore throat, or fever. A blood count should be performed and the drug stopped immediately if there is suspicion of a blood dyscrasia
Contra-indications: predisposition to bleeding (e.g. active peptic ulcer, haemorrhagic stroke in previous 6 months, proliferative diabetic retinopathy, poorly controlled hypertension); history of severe tachyarrhythmia; prolongation of QT interval; unstable angina; myocardial infarction in previous 6 months; coronary intervention in previous 6 months; congestive heart failure
Hepatic impairment: avoid in moderate or severe liver disease
Renal impairment: avoid if eGFR less than25 ml/minute/1.73 m^2
Pregnancy: avoid—toxicity in *animal* studies
Breast feeding: present in milk in *animal* studies—manufacturer advises avoid
Side Effects: diarrhoea, nausea, vomiting, dyspepsia, flatulence, abdominal pain, anorexia, tachycardia,

palpitation, angina, arrhythmia, oedema, rhinitis, pharyngitis, dizziness, headache, malaise, rash, pruritus, ecchymosis; less commonly gastritis, myocardial infarction, congestive heart failure, postural hypotension, dyspnea, pneumonia, cough, insomnia, abnormal dreams, anxiety, hyperglycaemia, diabetes mellitus, anaemia, haemorrhage, myalgia; *rarely* increased urinary frequency, bleeding disorders, thrombocythaemia, renal impairment; *also reported* hypertension, pyrexia, hot flushes, thrombocytopenia, agranulocytosis, leucopenia, pancytopenia, aplastic anemia, hepatitis, conjunctivitis, tinnitus, Stevens-Johnson syndrome, toxic epidermal necrolysis

Dose: 100 mg twice daily 30 minutes before food

Note : Reduce dose to 50 mg twice daily with concomitant use of clarithromycin, erythromycin, itraconazole, or omeprazole, or with potent inhibitors of cytochrome P450 enzymes CYP3A4 or CYP2C19

- *Cilostazol 50 mg Tablets*

NITRATES (NITROVASODILATORS))

GLYCERYL TRINITRATE

Indications: prophylaxis and treatment of angina; left ventricular failure.

Cautions: hypotensive conditions, severe hepatic or renal impairment, hypothyroidism, head trauma, cerebral haemorrhage.

Contra-indications: Nitrate hypersensitivity, hypotension and hypovolemia, hypertrophic obstructive cardiomyopathy, aortic stenosis, mitral stenosis, constrictive pericarditis, marked anemia, closed-angle glaucoma.

Side Effects: throbbing headache, flushing, dizziness, postural hypotension, tachycardia.

Dose: sublingually, 0.3-1 mg repeated, as required.
By IV infusion, 10-200 mcg/minute.
Plaster, once daily on lateral chest wall, upper arm, thigh, abdomen or shoulder; siting replacement patch on different area.

- *Angised Tablets 0.5 mg.*
- *Nitroglycerin Sublingual Tablet 0.5 mg*
- *Nitroderm T.T.S. Self-Adhesive Patch, 5mg.*

- *Nitroglycerin Injection 25 mg/5ml, To Be Diluted Before Use.*

ISOSORBIDE DINITRATE

Indications: prophylaxis and treatment of angina; left ventricular failure.
Cautions, contra-Indications and Side Effects: (see Glyceryl trinitrate)
Dose: by mouth, angina, 30-120 mg daily in divided doses.
Left ventricular failure, 40-160 mg, up to 240 mg daily if required, in divided doses.

- *Vascardin Tablets 10 mg*
- *Isordil Tablets 10 mg*

ISOSORBIDE MONONITRATE

Indications: coronary heart disease; prophylaxis of angina pectoris; post-myocardial infarction therapy; pulmonary hypertension; adjunctive treatment in heart failure.
Cautions: pregnancy; not suitable for treating attacks of angina pectoris
Contra-indications: and ***Side Effects: (***see Glyceryl trinitrate)
Dose: initial dose, 5-10 mg twice daily for 2 days. Maintenance, 20 mg twice daily may be increased to 3 times daily.Max. 120 mg daily in divided doses.

- *Ismo Tablets 60 mg*

IVABRADINE

Indications: lowers the heart rate by its action on the sinus node. It is licensed for the treatment of angina in patients who are in normal sinus rhythm in combination with a beta-blocker, or when beta-blockers are contra-indicated or not tolerated. Ivabradine, in combination with standard therapy including a beta-blocker (unless contra-indicated or not tolerated), is also licensed for mild to severe stable chronic heart failure in patients who are in sinus rhythm
Cautions: monitor for atrial fibrillation or other arrhythmias (treatment ineffective); monitor for bradycardia, especially after any dose increase, and

discontinue if resting heart rate persistently below 50 beats per minute or continued symptoms of bradycardia despite dose reduction; intraventricular conduction defects; hypotension (avoid if severe); retinitis pigmentosa; elderly

Contra-indications: *for angina*, do not initiate if heart rate below 60 beats per minute; *for heart failure*, do not initiate if heart rate below 75 beats per minute; unstable or acute heart failure; cardiogenic shock; acute myocardial infarction; unstable angina; immediately after cerebrovascular accident; sick-sinus syndrome; sino-atrial block; patients dependent on pacemaker; second- and third-degree heart block; congenital QT syndrome

Hepatic impairment: manufacturer advises caution in moderate impairment; avoid in severe impairment

Renal impairment: manufacturer advises use with caution if eGFR less than 15 ml/minute/1.73 m^2—no information available

Pregnancy: manufacturer advises avoid—toxicity in *animal* studies

Breast feeding: present in milk in *animal* studies—manufacturer advises avoid

Side Effects: bradycardia, first-degree heart block, ventricular extrasystoles, headache, dizziness, visual disturbances including phosphenes and blurred vision; less commonly nausea, constipation, diarrhoea, palpitations, supraventricular extrasystoles, dyspnea, angioedema, vertigo, muscle cramps, eosinophilia, hyperuricaemia, raised plasma-creatinine concentration, rash; very rarely atrial fibrillation, second- and third-degree heart block, sick sinus syndrome

Dose: Angina, initially 5 mg twice daily, increased if necessary after 3–4 weeks to 7.5 mg twice daily (if not tolerated reduce dose to 2.5–5 mg twice daily); ELDERLY initially 2.5 mg twice daily

Heart failure, initially 5 mg twice daily, increased if necessary after 2 weeks to 7.5 mg twice daily (if not tolerated reduce dose to 2.5 mg twice daily)

- *Procoralan 5mg, 7.5mg Tablets*

PENTOXYFYLLINE (OXPENTIFYLLINE)

It is a methylxanthine derivative.

Indications: peripheral vascular disease; venous leg ulcers.
Cautions: hypotension, coronary artery disease, severe hepatic and renal impairment; porphyria.
Contra-indications: cerebral haemorrhage, extensive retinal haemorrhage, acute myocardial infarction, pregnancy, breast feeding.
Side Effects: hypotension, angina, gastrointestinal disturbances, dizziness, agitation, sleep disturbances, headache.
Dose: 400 mg, 2-3 times daily.

- *Trental Tablets 400 mg.*

TRIMETAZIDINE

Trimetazidine is an antiischemic agent.
Indications: preventive treatment of episodes of angina pectoris; adjuvant symptomatic treatment for vertigo and tinnitus in Menier's disease.
Dose: 35 mg orally twice daily.

- *Vastarel Tablets 35 mg.*

SYMPATHOMIMETICS

EPHEDRINE HYDROCHLORIDE

Indications: Reversal of hypotension from spinal or epidural anaesthesia
Cautions: hyperthyroidism, diabetes mellitus, ischaemic heart disease, hypertension, susceptibility to angle-closure glaucoma, elderly, pregnancy, may cause acute urine retention in rostatic hypertrophy.
Contra-indications: breast feeding.
Side effect: nausea, vomiting anorexia, tachycardia (sometimes bradycardia), arrhythmias, anginal pain, vasoconstriction with hypertension, vasodilation with hypotension, dizziness and flushing, dyspnea, headache, anxiety, restlessness, confusion, psychoses, insomnia, tremor, difficulty in micturition, urine retention, sweating hypersalivation, changes in blood-glucose concentrate in, very rarely angle-closure glaucoma.
Dose: by slow intravenous injection of a solution containing ephedrine hydrochloride 3mg/ml, 3-mg (max

9mg) repeated every 3-4 minutes according to response to max 30mg.

- *Ephedrine Hydrochloride 30mg/ ml injection.*

DOBUTAMINE HYDROCHLORIDE

Indications: inotropic support in infarction, cardiac surgery, cardiomyopathies, septic shock, and cardiogenic shock.
Cautions: severe hypotension complicating cardiogenic shock.
Side Effects: tachycardia and marked increase in systolic blood pressure indicate overdosage; phlebitis.
Dose: By IV infusion, 2.5-10 mcg/kg/minute, adjusted according to response.

- *Dobutrex Injection 250 mg/Vial*

DOPAMINE HYDROCHLORIDE

Indications: cardiogenic shock in infarction or cardiac surgery.
Cautions: correct hypovolemia; low dose in shock due to acute myocardial infarction.
Contra-indications: Tachyarrhythmias; pheochromocytoma.
Side Effects: nausea, vomiting, peripheral vasoconstriction, hypotension, hypertension, tachycardia.
Dose: by. IV infusion***:*** 2-5 mcg/kg/minute initially.

- *Intropin Injection 40 mg/ml, 200 mg/5 ml.*

ISOPRENALINE HYDROCHLORIDE

It is a nonselective beta agonist.
Indications: heart block, severe bradycardia.
Cautions: ischaemic heart disease, diabetes, hyperthyroidism.
Dose: by IV infusion, 0.5-10 mcg/minute.

- *Isoprenaline Injection 0.2mg/ml.*

ANTI-COAGULANTS AND RELATED DRUGS

DABIGATRAN ETEXILATE)

Indications: a direct thrombin inhibitor, is given orally for prophylaxis of venous thromboembolism in adults

after total hip replacement or total knee replacement surgery, Dabigatran etexilate is also licensed for the prevention of stroke and systemic embolism in patients with non-valvular atrial fibrillation and with one or more risk factors such as previous stroke or transient ischaemic attack, symptomatic heart failure, age ≥ 75 years, diabetes mellitus, or hypertension. Dabigatran etexilate has a rapid onset of action and does not require routine anticoagulant monitoring (INR tests are unreliable in patients taking dabigatran etexilate). The most common side-effect is haemorrhage and patients should be monitored for signs of bleeding or anaemia; treatment should be stopped if severe bleeding occurs

Cautions: also elderly; body-weight less than 50 kg; anaesthesia with postoperative indwelling epidural catheter (risk of paralysis—give initial dose at least 2 hours after catheter removal and monitor neurological signs); bacterial endocarditis; bleeding disorders; thrombocytopenia; recent biopsy or major trauma; oesophagitis, gastritis, gastro-oesophageal reflux; assess renal function (manufacturer recommends Cockroft and Gault formula to calculate creatinine clearance) before treatment in all patients and at least annually in elderly and patients with renal impairment; concomitant use of drugs that increase risk of bleeding

Contra-indications: active bleeding; significant risk of major bleeding (e.g. recent gastro-intestinal ulcer, oesophageal varices, recent brain, spine, or ophthalmic surgery, recent intracranial haemorrhage, malignant neoplasms, vascular aneurysm); do not use as anticoagulant for prosthetic heart valve

Hepatic impairment: avoid in severe liver disease, especially if prothrombin time already prolonged

Renal impairment: *for* prophylaxis of venous thromboembolism following knee or hip replacement surgery, reduce initial dose to 75 mg and subsequent doses to 150 mg once daily if creatinine clearance 30–50 ml/minute; reduce dose to 75 mg once daily if creatinine clearance 30–50 ml/minute and patient receiving concomitant treatment with verapamil; avoid if creatinine clearance less than 30 ml/minute; for *prophylaxis of stroke and systemic embolism in atrial fibrillation*, avoid if creatinine clearance less than 30 ml/minute; monitor

renal function at least annually (manufacturer recommends Cockroft and Gault formula to calculate creatinine clearance)
Pregnancy: manufacturer advises avoid unless essential—toxicity in *animal* studies
Breast feeding: manufacturer advises avoid—no information available
Side Effects: nausea, dyspepsia, diarrhoea, abdominal pain, anaemia, haemorrhage, less commonly hepatobiliary disorders, vomiting, dysphagia, gastro-intestinal ulcer, gastro-oesophageal reflux, oesophagitis, thrombocytopenia
Dose: Prophylaxis of venous thromboembolism following total knee replacement surgery, ADULT over 18 years, 110 mg (ELDERLY over 75 years, 75 mg) 1–4 hours after surgery, followed 12–24 hours later by 220 mg (ELDERLY over 75 years or patient receiving concomitant treatment with amiodarone or verapamil, 150 mg) once daily for 9 days.
Prophylaxis of venous thromboembolism following total hip replacement surgery, ADULT over 18 years, 110 mg (ELDERLY over 75 years, 75 mg) 1–4 hours after surgery, followed 12–24 hours later by 220 mg (ELDERLY over 75 years or patient receiving concomitant treatment with amiodarone or verapamil, 150 mg) once daily for 27–34 days.
Prophylaxis of stroke and systemic embolism in non-valvular atrial fibrillation ADULT over 18 years, 150 mg (ELDERLY over 80 years, patients at high risk of bleeding, or receiving concomitant treatment with verapamil, 110 mg) twice daily

- *Pradaxa capsules 75 mg, 110 mg*

HEPARIN

It is a an injectable anticoagulant
Indications: deep vein thrombosis, pulmonary embolism, unstable angina, disseminated intravascular coagulation, prevention of post-operative thrombosis.
Cautions: pregnancy, elderly, hepatic or renal impairment, heparin induced thrombocytopenia, hyperkalaemia.
Contra-indications: haemophilia and other haemorrhagic disorders, peptic ulcers, cerebral aneurysm, severe

hypertension, severe liver disease, recent surgery of eye or nervous system, hypersensitivity to heparin.
Side Effects: hemorrhage, skin necrosis, thrombocytopenia, hyperkalaemia, hypersensitivity (urticaria, angioedema, anaphylaxis), osteoporosis after prolonged use; rarely alopecia.
Dose: For prophylaxis of deep vein thrombosis in general surgery by subcutaneous injection, 5000 units 2 hours before surgery, then every 8-12 hours until patient is ambulant;
In pregnancy, 5000-- 10, 000 units every 12 hours. Treatment of deep vein thrombosis and pulmonary embolism, loading dose of 5000 units (10, 000 in pulmonary embolism) followed by continuous infusion of 15-- 25 units/Kg/Hr or treatment of deep vein thrombosis by subcutaneous injection of 15000 units every 12 hours. Monitoring of dosage on daily basis. In unstable angina, acute peripheral arterial occlusion, same as intravenous regimen for deep vein thrombosis and pulmonary embolism.

- *Heparin 25, 000 Units/ 5 ml Vial.*

ENOXAPARIN SODIUM

This is a low-molecular weight (LMW) heparin
Indications: prophylaxis of venous thromboembolic disease after certain procedures; prevention of thrombus formation in the extra-corporeal circulation during hemodialysis; treatment of established deep vein thrombosis; treatment of unstable angina and non Q-wave myocardial infarction during the acute stage,
in combination with aspirin.
Cautions: do not inject intramuscularly.
Contra-indications: allergic reactions; major clotting disorders; history of thrombocytopenia; active gastro-intestinal bleeding; acute infectious endocarditis; severe renal impairment; hemorrhagic vascular cerebral stroke; uncontrolled arterial hypertension; breastfeeding.
Side Effects: *(*See Heparin)
Dose: every 1 mg (0.01 ml) corresponds to 100 anti-Xa i.u.
In prophylaxis and curative treatment, it should be given by subcutaneous route.

During haemodialysis it should be given by extra vascular route.
Prophylaxis of venous thrombosis, 20 mg once daily.
Highly thrombogenic risk surgery (e.g. orthopedic surgery), 40 mg once daily.
Treatment should continue for 7-10 days.
Prevention of extra-corporeal thrombus during hemodialysis, 1mg/kg.
Treatment of established deep vein thrombosis, 1 mg/kg subcutaneous every 12 hours. Treatment period should not exceed 10 days.
Treatment of unstable angina and non-Q-wave myocardial infarction, 1 mg/kg SC every 12 hours for a period of 2-8 days. It should be administered concurrently with oral aspirin (100-325 mg daily).

- *LMWH Enoxaparin 2000, 4000, 6000, 8000, 10, 000 IU.*
- *Clexane 20 mg, 40 mg, 60mg, 80mg, 100mg Injection*

PROTAMINE SULPHATE

Indications: as an antidote for heparin
Cautions: increased risk of allergic reaction to protamine (includes previous treatment with protamine or protamine insulin, allergy to fish, men who are infertile or who have had a vasectomy)
Side Effects: nausea, vomiting, lassitude, flushing, hypotension, bradycardia, dyspnea; hypersensitivity reactions (including angioedema, anaphylaxis) reported.
Dose: by intravenous injection over approx. 10 minutes, 1 mg neutralizes 80 – 100 units of heparin when given within 15 minutes of heparin; if longer time, less protamine required as heparin is rapidly excreted; max. 50 mg.

- *Protamine Sulphate Injection 10 mg/5ml.*

WARFARIN SODIUM

It is an oral anticoagulant.
Indications: deep vein thrombosis, transient brain ischaemic attacks, prophylaxis with prosthetic heart valves.

Cautions: hepatic or renal disease, recent surgery; avoid crane berry juice, breast feeding.
Contra-indications: pregnancy, peptic ulcer, severe hypertension, bacterial endocarditis.
Side Effects: haemorrhage, hypersensitivity, alopecia, diarrhea, unexplained drop in hematocrit, 'purple toes', skin necrosis and hepatic dysfunction; also nausea and vomiting.
Dose: loading dose 10 mg daily for 2 days (5-6 mg if patient likely to be sensitive).
Maintenance, usually 3-9 mg from day 3, according to prothrombin time based on International Normalized Ratio (INR). doses are taken at the same time each day. The therapeutic range in prophylactic therapy of deep-vein thrombosis including high-risk surgery, 2-2.5 mg. Prophylactic therapy in hip surgery and fractured femur-operations, for treatment of deep vein thrombosis, pulmonary embolism, and transient ischaemic attacks, 2-3 mg per day. Recurrent deep-vein thrombosis and pulmonary embolism, arterial disease including myocardial infarction, arterial grafts, and prosthetic heart valves and grafts 3-4.5 mg per day.

- *Warfarin Tablets 1 mg, 2 mg, 5 mg.*

ANTIPLATELET DRUGS

ACETYLSALICYLIC ACID

It is a non steroidal anti-inflammatory drug (NSAID), used as an antithrombotic in low doses.
Indications: prophylaxis of stroke or myocardial infarction.
Cautions: asthma; uncontrolled hypertension; pregnancy; peptic ulcer; hepatic and renal impairment.
Contra-indications: children and adolescent under 16 years (Reye's syndrome) ; breastfeeding; active peptic ulceration; haemophilia and other bleeding disorders.
Side Effects: bronchospasm; gastro-intestinal haemorrhage.
Dose: secondary prevention of stroke or myocardial infarction, 300 mg daily (75, 81 or 100 mg daily for long term use with established cardiovascular disease, after

coronary bypass surgery; or 150--300 mg on as soon as possible after an ischemic event).

- *Aspirin Tablets 81 mg*

DIPYRIDAMOLE

This is an antithrombotic drug which decreases the platelet adhesiveness, thus inhibiting thrombus formation on the arterial side of the circulation; it has little effect on venous thromboembloism.

Indications: modifications of platelet function; all forms of coronary insufficiency; prophylaxis and after treatment of myocardial infarction; acute myocardial infarction without circulatory collapse; basic therapy in cardiac failure; cerebrovascular thrombosis; thrombosis of peripheral arteries; prevention of deep venous thrombosis of the leg.

Cautions: may exacerbate migraine, hypotension; myasthenia gravis; breast feeding; recent myocardial infarction, heart failure or aortic stenosis.

Side effect: gastrointestinal disturbances, dizziness, myalgia, throbbing headache, hot flushes and tachycardias, hypersensitivity.

Dose: by mouth, 300-600 mg daily in 3-4 divided doses before food.

- *Persantin Tablets 75 mg.*

FIBRINOLYTIC DRUGS

ANTI-FIBRINOLYTIC DRUGS AND HAEMOSTATICS

ABSORBABLE GELATIN SPONGE

Indications: effective in the control of capillary oozing and venous bleeding; variety of surgical procedures. It should be packed loosely in any cavities to prevent expansion damaging surrounding tissues.

Contra-indications: aural surgery where it might come into contact with fluid from the inner ear; opthalmic surgery where the vitreous or aqueous humour is exposed.

- *Sterispon.20x20cmm*
- *Gelfoam 20x20cmm.*

TRANEXAMIC ACID

Indications: it inhibits plasminogen activation and fibrinolysis. It may be useful when haemorrhage cannot be stopped as in prostatectomy, dental extraction in haemophiliacs, or menorrhagia; also can be used in hereditary angioedema and in thrombolytic overdose.
Cautions: reduce dose in renal impairment; massive haematuria (ureteric obstruction); regular eye examinations and liver function test in long-term treatment of hereditary angioedema.
Contra-indications: thromboembolic disease; severe renal impairment.
Side Effects: nausea, vomiting, diarrhoea (reduce dose); giddiness on rapid injection; disturbances in colour vision (discontinue)
Dose: by mouth, 1 -1.5 g 2-4 times daily.
By slow IV injection, 0.5 0 1 g 3 times daily for local fibrinolysis.

- *Cyclokapron Tablets 500 mg.*
- *Cyclokapron Injection 100 mg/ml.*

BLOOD-RELATED PRODUCT

FACTOR VIII FRACTION, DRIED

(Human Coagulation Factor VIII, Dried)
Dried factor VIII fraction is prepared from human plasma by a suitable fractionation technique; it may also contain varying amounts of von Willebrand factor
Indications treatment and prophylaxis of haemorrhagein congenital factor VIII deficiency (haemophilia A), acquired factor VIII deficiency, von Willebrand's disease
Cautions monitor for development of factor VIII inhibitors; intravascular haemolysis after large or frequently repeated doses in patients with blood groups A, B, or AB—less likely with high potency concentrates
Side Effects: gastro-intestinal disturbances, taste disturbances; flushing, palpitation; dyspnea, coughing; headache, dizziness, paraesthesia, drowsiness; blurred vision; antibody formation; hypersensitivity reactions including hypotension, angioedema, chills, fever, urticaria, and anaphylaxis

- *Kogenate; preparation of recombinant human coagulation factor VIII 250U, 500U, 1000U*

MISCELLANEOUS

DIOSMIN (FLAVONOID EXTRACTS OF RUTACEAE)

Indications: circulatory disorders in women, treatment of haemorrhoids, vascular protection and prevention and treatment of drug-induced bleeding and gastric bleeding due to capillary fragility
Side Effects: minor incidents such as gastralgia and headache; any gastric discomfort is avoided by taking the drug during meals.
Dose: phlebology, usual dose, 2 tablets daily in two divided doses midday and evening at meal times.
In acute haemorrhoidal episode, the dose is 6 tablets per day for the first 4 days, then 4 tablets per day for the following 3 days.

- *Daflon Tablets 500 mg*
- *Diosmin 450 mg + Hesperidin 50 mg Tablet*

LIPID-REGULATING DRUGS

FIBRATES

BEZAFIBRATE

Indications: hypertriglyceridaemia, hypercholesterolemia.
Cautions: reduce dose in moderate renal impairment; correct hypothyroidism before initiation of treatment
Contra-indications: severe renal or hepatic impairment, hypoalbuminaemina, primary biliary cirrhosis, gall bladder disease, nephrotic syndrome, pregnancy and breast feeding.
Side Effects: gastrointestinal disturbance, rash, pruritis, rarely peripheral neuropathy.
Dose: 400 mg daily after food (this sustained release dose form is not appropriate in renal impairment).

- *Bezalip Tablets S.R. 400 mg.*

STATINS

ATORVASTATIN

It is antilipemic agent, HMG-CoA reductase inhibitor
Indications: Used with dietary therapy for the following, primary hypercholesterolaemia, heterozygous familial hypercholesterolaemia, homozygous familial hypercholesterolaemia or combined Hyperlipidaemia in patients who have not responded to diet and other appropriate measures, prevention of cardiovascular events in patients with type 2 diabetes.
Cautions: Should be used with caution in those with history of liver disease or with a high alcohol intake. Hypothyroidism should be managed before treatment starting. Liver – function tests should carried out before and within1-3 months of starting treatment and thereafter at intervals of 6 months for 1 year. Should be used with caution in those with risk factor for myopathy or rhabdomyolysis.
Contra-indications: Hypersensitivity to atorvastatin or any component of the formulation, active liver disease, pregnancy, breast-feeding, unexplained persistent elevations of serum transaminases.
Side Effects: Headache, abdominal pain, flatulence, constipation, diarrhea, nausea, vomiting, rash, chest pain angina, insomnia, dizziness, hypoaesthesia, arthralgia, back pain, anorexia, malaise, weight gain, alopecia, urinary tract infection, sinusitis, pharyngitis, bronchitis, rhinitis, flu- like syndrome.
Dose: Primary hypercholesterolaemia and combined hyperlipidaemia, 10 mg once daily, if necessary, may be increased at intervals of at least 4 weeks to max. 80 mg once daily.Child 10-17 years (females >1 year postmenarche) 10 mg once daily (max. 20 mg/ day), prevention of cardiovascular events in type 2 diabetes, 10 mg once daily. No dosing adjustment required in renal impairment.

- *Lipitor 20 mg Tablets*

ROSUVASTATIN

Indications: primary hypercholesterolaemia (type IIa including heterozygous familial hypercholesterolaemia),

mixed dyslipidaemia (type IIb), or homozygous familial hypercholesterolaemia in patients who have not responded adequately to diet and other appropriate measures; prevention of cardiovascular events in patients at high risk of a first cardiovascular event
Cautions: same as other statins, patients of Asian origin (see under dose); patients with risk factors for myopathy or rhabdomyolysis, including personal or family history of muscular disorders or toxicity (see under dose)
Hepatic impairment: Statins should be used with caution in those with a history of liver disease and avoided in active liver disease or when there are unexplained persistent elevations in serum transaminases
Renal impairment: initially 5 mg once daily (do not exceed 20 mg daily) if eGFR 30–60 ml/minute/1.73 m^2; avoid if eGFR less than 30 ml/minute/1.73 m^2
Side Effects: same as other statins also proteinuria; very rarely gynaecomastia, haematuria; *also reported* oedema, Stevens-Johnson syndrome
Dose: Hypercholesterolaemia, initially 5–10 mg once daily increased if necessary at intervals of at least 4 weeks to 20 mg once daily, increased after further 4 weeks to 40 mg daily only in severe hypercholesterolaemia with high cardiovascular risk and under specialist supervision; ELDERLY over 70 years, initially 5 mg once daily; patient of ASIAN origin or with risk factors for myopathy or rhabdomyolysis, initially 5 mg once daily increased if necessary to max. 20 mg daily Prevention of cardiovascular events, 20 mg once daily; ELDERLY over 70 years, patient of ASIAN origin or with risk factors for myopathy or rhabdomyolysis, initially 5 mg once daily increased if necessary to max. 20 mg daily
Note : Initially 5 mg once daily with concomitant fibrate increased if necessary to max. 20 mg daily.

- *Crestor Tablets 10 mg*

SIMVASTATIN

This is an HMG CoA reductase inhibitor.
Indications: elevated total and LDL cholestrol levels in primary hyper-cholesterolaemia.
Cautions: liver function tests should be performed before and periodically during the treatment*;* correct hypothyroidism before initiation of treatment; symptoms

of diffuse muscle pain of unknown origin; tenderness or weakness should be reported immediately particularly if accompanied by fever or malaise; severe renal failure.
Contra-indications: active liver disease; pregnancy; and breast feeding, women of child-bearing potential.
Side Effects: Reversible myositis is rare but significant side effect. altered liver function test; paresthesia; dyspepsia, insomnia, nausea, abdominal pain, flatulence, constipation, diarrhea, rash and hypersensitivity reactions and headache. also alopecia, dizziness, anaemia, peripheral neuropathy, asthenia, jaundice, pacreatitis. Risk of myopathy increases if combined with fibrates or niacin.
Dose: 20-40 mg once daily at night.

- *Zocor Tablets 20 mg*

BILE ACID BINDING RESIN

COLESTYRAMINE (CHOLESTYRAMINE)

This is a bile acid-binding resin.
Indications: hypercholesterolemia (type II a) in patients who have not responded to diet and other measures; primary prevention of coronary heart disease in men 35 to 59 years of age; pruritis associated with primary billiary obstruction & cirrhosis; diarrhoeal disorders..
Cautions: supplements of fat-soluble vitamins and of folic acid may be required with high doses, particularly in children, may reactivate peptic ulceration; hepatic impairment, pregnancy, breast-feeding.
Contra-indications: complete biliary obstruction.
Side Effects: Since it is not absorbed from GI tract, hence side effect are GI like nausea, vomiting, GI discomfort, constipation.
Dose: usually 12-24 g daily in liquid in single or divided doses; up to 36 g daily in resistant case.

- *Questran Sachets 4 G/Sachet.*

OMEGA-3 FATTY ACID COMPOUNDS

OMEGA-3-ACID ETHYL ESTERS

Indications: adjunct to diet and statin in type IIb or III hypertriglyceridaemia; adjunct to diet in type IV

hypertriglyceridaemia; adjunct in secondary prevention in those who have had a myocardial infarction in the preceding 3 months
Cautions: haemorrhagic disorders, anticoagulant treatment (bleeding time increased)
Hepatic impairment: monitor liver function
Pregnancy: manufacturers advise use only if potential benefit outweighs risk—no information available
Breast-feeding: manufacturers advise avoid—no information available
Side Effects: dyspepsia, nausea; less commonly taste disturbances, abdominal pain, gastritis, dizziness; *rarely* hepatic disorders, headache, hyperglycaemia, acne, rash; very rarely gastro-intestinal haemorrhage, hypotension, nasal dryness, urticaria, and increased white cell count
Dose: hypertriglyceridaemia, initially 2 capsules daily with food, increased if necessary to 4 capsules daily
Secondary prevention after myocardial infarction, 1 capsule daily with food

- *Omacor Capsules, 1 g of omega-3-acid ethyl esters containing eicosapentaenoic acid 460mg and docosahexaenoic acid 380 mg.*

EZETIMIBE

inhibits the intestinal absorption of cholesterol. It is licensed as an adjunct to dietary manipulation in patients with primary hypercholesterolaemia in combination with a statin or alone
Indications: adjunct to dietary measures and statin treatment in primary hypercholesterolaemia and homozygous familial hypercholesterolaemia (ezetimibe alone in primary hypercholesterolaemia if statin inappropriate or not tolerated); adjunct to dietary measures in homozygous sitosterolaemia
Hepatic impairment: avoid in moderate and severe impairment—may accumulate
Pregnancy: manufacturer advises use only if potential benefit outweighs risk—no information available
Breast feeding: manufacturer advises avoid—present in milk in *animal* studies
Side Effects: gastro-intestinal disturbances; headache, fatigue; myalgia; *rarely* arthralgia, hypersensitivity reactions (including rash, angioedema, and anaphylaxis),

hepatitis; very rarely pancreatitis, cholelithiasis, cholecystitis, thrombocytopenia, raised creatine kinase, myopathy, and rhabdomyolysis

Dose: ADULT and CHILD over 10 years, 10 mg once daily

- *Ezetrol Tablets 10 mg*

VASOCONSTRICTOR

SYMPATHOMIMETICS

NORADRENALINE ACID TARTRATE / NOREPINEPHRINE BITARTRATE

Indications: Used as an emergency method of elevating blood pressure where other measures have failed.

Cautions: coronary, mesenteric, or peripheral vascular thrombosis; flowing myocardial infarction, Prinzmetal's variant angina, hyperthyroidism, diabetes mellitus; hypoxia or hypercapnia; uncorrected hypovolemia; elderly; extravasation at injection site may cause necrosis; interactions***:*** sympathomimetic.

Contra-indications: hypertension (monitor blood pressure and rate of flow frequently); pregnancy.

Side Effects: hypertension, headache, bradycardia, arrhythmias, peripheral ischaemia.

Dose: acute hypotension, by intravenous infusion, via central venous catheter, of a solution containing noradrenaline acid tartrate 80 mcg/ml (equivalent to noradrenaline base 40 mcg/ml) at an initial rate of 0.16 – 0.33 ml/minute, adjusted according to response. Cardiac arrest, by rapid intravenous or intracardiac injection, 0.5 – 0.75ml of a solution containing noradrenaline acid tartrate 200 mcg/ml (equivalent to noradrenaline base 100 mcg/ml)

- *Noradrenaline / Norepinephrine**:** Injection, Noradrenaline Acid Tartrate 2 mg/ml (Equivalent To Noradrenaline Base 1 mg/ml)*

LOCAL SCLEROSING AGENT

ETHANOLAMINE OLEATE (MONOETHANOLAMINE OLEATE)

Indications: sclerotherapy of varicose veins.

Cautions: extravasation may cause necrosis of tissues.
Side Effects: allergic reactions, including anaphylaxis.
Dose: by IV injection***:*** 2-5 ml divided between 3-4 sites; repeated at weekly intervals.

- *Ethanolamine Oleate Injection 5%*

3 - RESPIRATORY SYSTEM

BRONCHODILATORS AND ASTHMA DRUGS

AMINOPHYLLINE

This is a xanthine bronchodilator. Aminophylline is a stable mixture of theophylline and ethylenediamine. The latter confers greater solubility in water.

Indication: reversible airways obstruction, status asthmaticus, left ventricular failure, severe acute asthma.

Cautions: reduce dose in liver disease; epilepsy, breast-feeding, pregnancy, cardiac disease, elderly patients, fever, hypertension, hyperthyroidism; peptic ulcer and hypokalemia.

Side Effects: tachycardia, palpitations, nausea, gastro-intestinal disturbances, insomnia, arrhythmias, and convulsions especially/if given rapidly by intravenous injection; use of suppositories for more than a few days may cause proctitis, intramuscular injection is painful (therefore this route is not used). Neonatal irritability and apnoea have been reported. Allergy to ethylene diamine may develop.

Dose: by mouth, 100-300mg 3-4 times daily, preferably after food.

For doses of sustained-release preparation, 1 tablet twice daily initially, increased after 1 week to 2 tablets twice daily.

Deteriorating acute asthma not previously treated with theophylline, by slow IV Injection over 20 minutes, 250-500mg (5mg/kg), then as for acute severe asthma. Child, 5mg/kg then as for acute severe asthma.

Acute severe asthma, by IV infusion, 500 mcg/kg/hr, adjusted according to plasma-theophylline concentration.

Child 6 months - 9 years, 1mg/kg/hour.

10-16years, 800 mcg/kg/hour adjusted according to plasma-theophylline concentration.

- *Nuelin SA Tablets 250mg*
- *Aminophylline Injection 250mg/10ml*

FLUTICASONE PROPIONATE

Fluticasone is a synthetic corticosteroid and is used to decrease inflammation in the lungs.
Indications: Prophylaxis of asthma.
Cautions: active or quiscent tuberculosis; Diabetes
Contra-indications: Known sensitivity or allergy; children below 4 years
Side effect: Yeast infection of the mouth (oral thrush); Throat irritation; Hoarse voice; Unexpected narrowing of the airways (paradoxical bronchospasm)
Inhaled corticosteroids have considerably fewer side effects than steroids taken by mouth. However, when taken for long periods of time at high doses, inhaled steroids do have the potential to cause side effects such as glaucoma, cataracts, thinning of the bones (osteoporosis), slowed growth in children and adolescents, and to suppress the functioning of the adrenal glands.
Dose: 100 to 500mg twice daily, increased according to severity of asthma; max. 1mg twice daily.

- *Flixotide 250mcg Diskus*
- *Flixotide 125mcg Evohaler*
- *Flixotide Nebules 0.5mg/2ml*

BECLOMETASONE DIPROPIONATE

(Beclomethasone Dipropionate)
Indication: A corticosteroid used in chronic airways obstructions, especially in asthma not controlled by bronchodilators.
Cautions: respiratory infection, active or quiescent tuberculosis; may need to reinstate systemic therapy during periods of stress or when airways obstruction or mucus prevent drug access to smaller airways.
Side Effects: hoarseness; candidiasis of mouth or throat, usually only with large doses (rinsing the mouth with water after inhalation of a dose; it can be reduced by using spacer; antifungal lozenges may help).
Dose: Standard dose inhalers***:***
by aerosol inhalation, 100 mcg 3-4 times daily or 200 mcg twice daily (in more severe cases, initially 600-800 mcg daily).
Child, 50-100 mcg 2-4 times daily, reduced to the minimum effective dose.

High d*ose* Inhalers*:*
By aerosol inhalation, 500 mcg twice daily or 250 mcg 4 times daily; if necessary the dose may be increased to 500 mcg 4 times daily.

- *Becotide 50 mcg/Metered Inhalation*

BUDESONIDE

Indication: A corticosteroid used in prophylaxis of asthma especially if not fully controlled by bronchodilators or cromoglycate.
Cautions: pulmonary tuberculosis and viral infections in the airways; pregnancy.
Side Effects: mild irritation in the throat, coughing and hoarseness; candidal infections of the oropharynx; bronchoconstriction in hyperreactive patients.
Dose: adults, initially or in severe asthma, or when reducing or discontinuing oral corticosteroids, 1-2mg twice daily.
Child 3 months - 12 years, 0.5 - 1mg twice daily.
Maintenance, usually half above doses.
Croup, 2mg as a single dose (or as two 1mg doses separated by 30 minutes).

- *Pulmicort Respules (Single dose Nebulizing Solution 500 mcg/2ml*

ADRENALINE (Epinephrine))

Indication: A non-selective adrenoceptor agonist, used in reversible airways obstruction; emergency treatment of acute anaphylaxis; angioedema; cardiopulmonary resuscitation.
Cautions: hyperthyroidism, diabetes, ischaemic heart disease, hypertension, elderly patients. Tolerance to bronchodilator effect may develop. Not to be given intravenously or with tricyclic antidepressants, digoxin, or quinidine because of increased risk of arrhythmias.
Interactions*:* adrenaline may cause severe hypertension in those receiving beta-blockers. Patients on tricyclic antidepressants are considerably more susceptible to arrhythmias, calling for the dose of adrenaline to be reduced by 50%.
Side Effects: nausea, vomiting; tachycardia, arrhythmias, palpitation, cold extremities, hypertension (risk of cerebral haemorrhage); dyspnea, pulmonary oedema (on

excessive dosage or extreme sensitivity); anxiety, tremor, restlessness, headache,
weakness, dizziness; hyperglycaemia; urinary retention; sweating; tissue necrosis at injection site and angle-closure glaucoma also reported.
Dose: acute anaphylaxis by IM (or SC) injection of 1***:*** 1000 (1mg/ml) solution, adult, 0.5- 1ml. Child***:*** 6-12 years, 0.5ml; 5 years, 0.4ml; 3-4 years, 0.3ml; 2 years, 0.2ml; 1 year, 0.1ml; under 1 year, 0.05ml.
These doses may be repeated every 10 minutes according to blood pressure and pulse until improvement occurs. In underweight children (2-12 years), use half the above doses. Intravenous route for the 1 in 10, 000 (100 mcg/ml) preparation should be used with extreme care.

- *Adrenaline 1:1000 Injection*
- *Adrenaline 1:10, 000 in PFS*

IPRATROPIUM BROMIDE

Indication: An anti-muscarinic bronchodilator used in reversible airways obstruction, particularly in chronic bronchitis. Ipratropium bromide is used intranasally for the treatment of rhinorrhoea in allergic and non-allergic rhinitis. It has also relieved rhinorrhoea and sneezing associated with the common cold.
Cautions: glaucoma (standard doses are unlikely to be harmful); prostatic hypertrophy. First inhalation dose should be given under medical supervision.
Side Effects: dry mouth occasionally reported; rarely urinary retention, constipation.
Dose: by inhalation of nebulized solution, 100-500 mcg up to 4 times daily.
Child 1 month-3 years, 62.5-250 meg up to 3 times daily. 3-14 years, 100-500 meg up to 3 times daily.

- *Atrovent Solution 0.25mg/ml - 20ml Bottle.*
- *Ipratrpium bromide 500mg + Salbutamol 2.5mg/2.5ml vial*

SALBUTAMOL

Indication: A selective beta 2-adrenceptor agonist used in reversible airway obstruction, status asthmaticus, severe acute asthma and premature labour.

Cautions: hyperthyroidism, ischaemic heart disease, hypertension, pregnancy, elderly patients (reduce dose); intravenous administration to diabetics (blood sugar estimates required).
Side Effects: fine tremor (usually hands), nervous tension, headache, peripheral vasodilatation, tachycardia (seldom troublesome when by aerosol inhalation); hypokalaemia after high doses, slight pain on intramuscular injection.
Dose: by mouth, 4mg (elderly and sensitive patients initially 2mg) 3-4 times daily, max. 8mg (but unlikely to be tolerated); Child under 2 years, 100 mcg/kg 4 times daily (not licensed). Child 2-6 years, 1-2mg 3 -4 times daily. 6-12 years, 2mg 3-4 times daily. By SC or IM injection, 500 mcg repeated every 4 hours if necessary. By slow IV injection, 250 mcg repeated if necessary. By continuous IV infusion, initially 5 mcg/minute, adjusted according to response and heart-rate usually in the range of 3-20 mcg/minute or more if necessary. By aerosol inhalation, acute and intermittent episodes of wheezing and asthma, 100-200 mcg repeated after 4 hours if necessary; Child, 100 mcg. Prophylaxis in exercise-induced bronchospasm, 200 mcg. Child, 100 mcg. Chronic maintenance therapy, 200 mcg 3-4 times daily, or in severe bronchospasm every 4 hours. Child, 100 mcg 3-4 times daily increased to 200 mcg if necessary. By inhalation of nebulized solution, chronic bronchospasm unresponsive to conventional therapy and severe acute asthma, 2.5mg (2.5ml of a solution containing 1mg/ml), repeated up to times daily; increased to 5mg if necessary. In refractory patients with severe acute asthma 10mg can be used if side effects permit. Child 2.5mg, increased to 5mg if required.

- *Ventolin 2mg Tablets*
- *Ventolin 2mg/5ml Syrup*
- *Ventolin 100 mcg Inhaler /Metered Inhalation*
- *Ventolin 0.5mg/ml Injection*
- *Ventolin 5mg/1ml Respiratory Solution*
- *Ventolin Diskus 200mcg/dose,*
- *Ventolin 1 mg/ml Nebules,*

LEUKOTRIENE RECEPTOR ANTAGONISTS

MONTELUKAST

Indications: prophylaxis of asthma, see notes above and Management of Chronic Asthma table, p. 180; symptomatic relief of seasonal allergic rhinitis in patients with asthma

Pregnancy: manufacturer advises avoid unless essential, see also notes above

Breast-feeding: manufacturer advises avoid unless essential

Side Effects: abdominal pain, thirst, headache, hyperkinesia (in young children); less commonly dry mouth, dyspepsia, oedema, dizziness, drowsiness, malaise, sleep disturbances, sleep-walking, abnormal dreams, anxiety, agitation (including aggressive behaviour or hostility), depression, psychomotor hyperactivity (including irritability and restlessness), paraesthesia, hypoaesthesia, seizures, arthralgia, myalgia (including muscle cramps), epistaxis, bruising; rarely palpitation, tremor, disturbance in attention, memory impairment, increased bleeding tendency; very rarely hepatic eosinophilic infiltration, hepatic disorders, hallucinations, suicidal thoughts and behaviour, disorientation, Churg-Strauss syndrome (see notes above), erythema nodosum, erythema multiforme

Dose. Prophylaxis of asthma, ADULT and CHILD over 15 years, 10mg once daily in the evening; CHILD 6 months–6 years 4mg once daily in the evening, 6–15 years 5mg once daily in the evening. Seasonal allergic rhinitis, ADULT and CHILD over 15 years, 10mg once daily in the evening

- *Singulair Tablets, 5 mg, 10 mg*
- *Singulair Granules, 4 mg*

DRUGS USED IN THE TREATMENT OF ALLERGIC DISORDERS

CETIRIZINE HYDROCHLORIDE

Indication: Long-acting non-sedating antihistamine with some mast-cell stabilising activity used in symptomatic relief of allergy such as hay fever, urticaria.

Cautions: prostatic hypertrophy, urinary retention, glaucoma and hepatic disease.
Contra-indications: ***pregnancy*** and breast feeding.
Side Effects: palpitations and arrhythmias; hypotension; hypersensitivity reactions; depression.
Dose: adult and child over 6 years, 10mg daily or 5mg twice daily.
Child 2-6 years, hay fever, 5mg daily or 2.5mg twice daily.

- *Zyrtec 10mg Tablets*
- *Zyrtec 5mg/5ml Syrup*

CHLORPHENAMINE MALEATE

(Chlorpheniramine maleate)
Indication: symptomatic relief of allergic conditions including urticaria and angioedema, rhinitis, and conjunctivitis, and in pruritic skin disorders.
Intravenously as an adjunct in the emergency treatment of anaphylactic shock.
Cautions: epilepsy, prostatic hypertrophy, glaucoma and hepatic disease.
Side Effects: drowsiness; impaired ability to drive or operate machinery; effects of alcohol maybe increased; headache; psychomotor impairment, anti-muscarinic effects such as urinary retention, dry mouth, blurred vision, and gastro-intestinal disturbances; occasional rashes; rarely photosensitivity reaction and paradoxical stimulation especially with high doses and in children.
Dose: by mouth, 4mg 3-4 times daily.
Max. dose, 24mg daily.
Child under 1 year, not recommended.
1-2 years, 1mg twice daily.
2-5 years, 1mg 4-6 times daily with a max. dose of 6mg daily. 6-12 years, 2mg 4-6 times daily with a max. dose of 12mg daily.

- *Piriton 4mg Tab"*
- *Chlorhistol Tablets 4mg*
- *Chlorhistol Syrup 2mg/5ml*

CYPROHEPTADINE HYDROCHLORIDE

Indications**:** Perennial and seasonal allergic rhinitis and other allergic symptoms including urticaria

***Cautions*:** used with caution in prostatic hypertrophy, urinary retention, susceptibility to angle-closure glaucoma, and pyloroduodenal obstruction.also in elderly patients. Caution may be required in epilepsy. Children and the elderly are more susceptible to side effects. Many antihistamines should be avoided in acute porphyria but some are thought to be safe.

***Contra-indications*:** Hypersensitivity to cyproheptadine or any component of the formulation. narrow-angle glaucoma. bladder neck obstruction. pyloroduodenal obstruction. symptomatic prostatic hyperplasia. stenosing peptic ulcer. concurrent use of MAO inhibitors. Use in debilitated elderly patients. use in premature and term newborns due to potential association with SIDS and in breast feeding**.**

***Renal Impairment*:** No dosage adjustment provided in manufacturer's labeling. However, elimination is diminished in renal insufficiency.

***Hepatic Impairment*:** No dosage adjustment provided in manufacturer's labeling.

***Pregnancy*:** Most manufacturers of antihistamines advise avoiding their use during pregnancy, however, there is no evidence of teratogenicity except for hydroxyzine where toxicity has been reported with high doses in animal studies. The use of sedating antihistamines in the latter part of the third trimester may cause adverse effects in neonates such as irritability, paradoxical excitability, and tremor.

***Breast-feeding*:** Most antihistamines are present in breast milk in varying amounts; although not known to be harmful, most manufacturers advise avoiding their use in mothers who are breast-feeding.

***Side Effects*:** Drowsiness is a significant side-effect with most of the older antihistamines although paradoxical stimulation may occur rarely, especially with high doses or in children and the elderly. Drowsiness may diminish after a few days of treatment and is considerably less of a problem with the newer antihistamines. more common with the older antihistamines include headache, psychomotor impairment, and antimuscarinic effects such as urinary retention, dry mouth, blurred vision, and gastro-intestinal disturbances. Rare: of antihistamines include hypotension, palpitation, arrhythmias,

extrapyramidal effects, dizziness, confusion, depression, sleep disturbances, tremor, convulsions, hypersensitivity reactions (including bronchospasm, angioedema, and anaphylaxis, rashes, and photosensitivity reactions), blood disorders, liver dysfunction, and angle-closure glaucoma.
Dose: Adult**:** 4 mg 3 times daily. usual range: 4–20 mg daily, max. 32 mg daily. CHILD 2–6 years 2 mg 2–3 times daily, max. 12 mg daily 7–14 years 4 mg 2–3 times daily, max. 16 mg daily

- *Periactin tablets 4mg*

LORATADINE

Indication: allergic rhinitis; chronic urticaria and other allergic dermatologic disorders. symptomatic relief of allergy such as hay fever
Cautions: children under 12 years of age; pregnancy; nursing mothers.
Contra-indications: sensitivity or idiosyncrasy reactions.
Dose: adult and child over 6 years, 10mg once daily. Child 2-5 years, 5mg daily.

- *Claritine Tablets 10mg*

MEQUITAZINE

Indications*:* Treatment of various allergic symptoms: vasomotor rhinitis, allergic rhinitis (seasonal or perennial), conjunctivitis, angineurotic, oedema, urticarial. Supportive symptomatic trreament of prurginous dermatoogica conditins (eczema, prurigo)
Contra-indications: avid combination with MAOI's, closed angle glaucocoma, prostatic adenoma.
Dose: 1.25mg/2.5ml per 5 kg per day.

- *Primalan Syrup 2.5mg / 5ml*

PROMETHAZINE HYDROCHLORIDE

Indication: symptomatic relief of allergy such as hay fever, urticaria, emergency treatment of anaphylactic reactions; premedication in anesthesia; sedation; motion sickness.
Cautions: intramuscular injection may be painful.
Contra-indications: porphyria.

Side Effects: Headache, psychomotor impairment, and antimuscarinic effects such as urinary retention, dry mouth, blurred vision, and gastro-intestinal disturbances. Cardiovascular adverse effects more commonly seen after injection***:*** bradycardia, tachycardia, transient minor increases in blood pressure and occasional hypertension. Jaundice and blood dyscrasias have been reported, and extrapyramidal effects may occur at high doses. Venous thrombosis has been reported at the site of intravenous injections, and arteriospasm and gangrene may follow inadvertent intra-arterial injection. intramuscular injection may be painful.
Dose: by mouth, 25mg at night, may be increased to 50-75mg at night if necessary.
Child below 2 years, not recommended.
2-5 years, 5-15mg daily.
5-10 years, 10-25mg daily.
By IM injection, adult, 25-50mg.
Child 5-10 years, half oral dose i.e 6.25-12.5mg.
By slow IV injection after dilution with water for injection to 2.5mg/ml, 25-50mg.
Max. parenteral dose, 100mg.

- *Phenergan Tablet 25mg*
- *Phenergan Injection 50mg/2ml*

ALLERGEN IMMUNOTHERAPY

OMALIZUMAB

Indications: prophylaxis of allergic asthma
Cautions: autoimmune disease; susceptibility to helminth infection (discontinue if infection does not respond to anthelmintic).
Hepatic impairment manufacturer advises caution—no information available
Renal impairment manufacturer advises caution (no information available)
Pregnancy manufacturer advises avoid unless essential
Breast-feeding manufacturer advises avoid (present in milk in animal studies)
Side-effects : abdominal pain, headache, pyrexia. less commonly dyspepsia, nausea, diarrhoea, weight gain, postural hypotension, flushing, pharyngitis, bronchospasm, cough, syncope, paraesthesia, dizziness,

drowsiness, malaise, influenza-like illness, photosensitivity, urticaria, rash, pruritus; rarely laryngoedema, parasitic infection, antibody formation; also reported arterial thromboembolic events, Churg-Strauss syndrome, thrombocytopenia, arthralgia, myalgia, joint swelling, alopecia, serum sickness (including fever and lymphadenopathy)
Dose By subcutaneous injection, ADULT and CHILD over 6 years, according to immunoglobulin E concentration and body-weight,

- *Xolair Injection, 150 mg/ml, 0.5-ml (75-mg) prefilled syringe 1-ml (150-mg) prefilled syringe*

DRUGS USED IN TREATMENT OF COUGH

DIPHENHYDRAMINE HYDROCHLORIDE

Indication: cough suppression; common cold and allergy symptoms.
Cautions: may cause drowsiness; alcoholic drinks should be avoided. pregnancy
Side Effects: sedation and drowsiness.
Dose: adult, 25-50mg (10-20ml of adult preparation) 3-4 times daily.
Child 1-5 years, 6.5mg (5ml of paediatric preparation) 3 times daily.
Child 6-12 years, 6.25-25mg (5-15ml of paediatric preparation) 3-4 times daily.

- *Amydramine 14mg/5ml Expectorant*
- *Amydramine 7mg/ 5ml Paediatric*

RESPIRATORY STIMULANTS AND PULMONARY SURFACTANTS

BERACTANT

Indication: A bovine lung extract used in treatment of respiratory distress syndrome (RDS) in newborn premature infants with a bodyweight of 700 g or greater who are intubated and are receiving mechanical ventilation.
Cautions: should be administered with adequate facilities for ventilation and monitoring of babies with RDS.

Artificial warming methods of the product should not be used,

Side Effects: pulmonary and intracranial haemorrhages have been reported. Also, Increased risk of pulmonary haemorrhage, especially in more premature infants. A transient decrease in brain electrical activity has been reported in neonates. Transient bradycardia has also been reported. Giving surfactant has occasionally been associated with obstruction of the endotracheal tube by mucus.

Dose: by intratracheal instillation, 100mg phospholipids/kg birthweight in a volume not exceeding 4ml/kg.

The dose should be administered early in the course of RDS i.e. preferably less than 8 hours of age.

The dose may be repeated within 48 hours at intervals of at least 6 hours for up to 4 doses.

- *Survanta Suspension For Instillation Equivalent To 200mg Total Phospholipids 100mg/4ml, 200mg/8ml*

MUCOLYTICS

BROMHEXINE HCl

Indication: Bromhexine is a mucolytic used in the treatment of respiratory disorders associated with productive cough.

Cautions: gastric ulceration, asthmatic patients; reduced Clearance of bromhexine or its metabolites in patients with severe hepatic or renal impairment.

Side Effects: Gastrointestinal adverse effects may occur occasionally with bromhexine and a transient rise in serum aminotransferase values has been reported. Other reported side effects include headache, dizziness, sweating, and skin rashes. Inhalation of bromhexine has occasionally produced cough or bronchospasm in susceptible subjects.

Dose: by mouth, 8-16mg 3-4 times daily.

Child up to 1 year, 2mg twice daily.

1-5 years, 4mg twice daily.

6-10 years, 4mg 4 times daily.

- *Bisolvon 4mg/5ml Elixir*
- *Mucolyte 4mg/ 5ml Syrup*

N-ACEYCYSTEINE (NAC)

Acetylcysteine exerts an intense mucolytic action on mucous and mucopurulent secretions, by depolymerizing the mucoproteic complexes and the nucleic acids which confer viscosity to the vitreous and purulent component of the sputum and of other secretions. It exerts a direct antioxidant action.

Indications*:* Reduction of viscosity of mucous secretions of the respiratory tract, antidote in for paracetamol poisoning.

Cautions**:** patients with asthma, liver cirrhosis and peptic ulcer disease. advised to drink plenty of water per to prevent cysteine renal stones which are rare but can occur.

Contra-indications: Hypersensitivity

Side Effects: are considered rare but may include allergic reactions (pruritus, urticaria,
rash, angioedema), dyspnea, bronchospasm, stomatitis, abdominal pain, nausea,
vomiting and diarrhoea

Dose: Above 6 years of age or adults. 600mg 1 to 2 times a day preferably in the evening.

- *ACC long 600mg Effervescent Tablets*

4 - CENTRAL NERVOUS SYSTEM

HYPNOTICS, SEDATIVES AND ANXIOLYTICS

ALPRAZOLAM

Indications: anxiety, for short-term use
Cautions: see under diazepam
Contra-indications: see under diazepam
Side Effects: see under diazepam
Dose: 250-500 mcg 3 times daily (elderly or debilitated patients 250 mcg 2-3 times daily), increased if necessary to a total of 3 mg daily

- *Xanax Tablets 250 mcg; 500 mcg*

BROMAZEPAM

Indications: short-term treatment of anxiety and associated states.
Cautions: rebound or withdrawal symptoms following abrupt withdrawal; elderly patients; hepatic disease, renal impairment, obesity.
Contra-indications: myasthenia gravis, narrow angle glaucoma, severe hepatic or respiratory disease, sleep apnoea, pregnancy and breast-feeding.
Side Effects: Hypotension, palpitation, tachycardia; drowsiness, ataxia, dizziness, confusion, depression etc, rash, pruritis; nausea, vomiting, xerostomia; incontinence, decrease in libido; weakness, muscle spasm; blurred vision, depth perception decreased.
Dose: 3-18 mg daily in divided doses.
Elderly patients half adult dose.
Max. (in hospitalized patients) 60 mg daily in divided doses.

- *Lexotanil Tablets 1.5 mg, 3 mg*

CHLORAL HYDRATE

Indications: insomnia, sedation in the elderly.
Cautions: doses are taken well-diluted with water to minimize gastro-intestinal disturbances. Contact with skin and mucous membranes should be avoided;

Pregnancy: and breast feeding; respiratory disease, history of drug or alcohol abuse, marked personality disorder; reduce dose in elderly and debilitated; avoid prolonged use (and abrupt withdrawal thereafter); hepatic impairment
Contra-indications: severe cardiac disease, gastritis, hepatic and renal disease; pregnancy; breast-feeding; porphyria
Side Effects: gastric irritation (nausea and vomiting reported), abdominal distention and flatulence; also ataxia, confusion, rashes, headache, lightheadedness, ketonuria, excitement, nightmares, delirium (especially on abrupt withdrawal); dependence (may be associated with gastritis and renal damage) on prolonged use
Dose: insomnia, 0.5-1 g (max. 2 g), 15-30 minutes before bed time.
Child, 30-50 mg/kg up to a max. single dose of 1 g.
Sedation, 250 mg 3 times daily.

- *Chloral Hydrate Elixir 200 mg/ 5ml*

CHLORDIAZEPOXIDE

Indications: anxiety, acute alcohol withdrawal.
Cautions: see under Diazepam
Contra-indications: see under Diazepam
Side Effects: see under Diazepam
Dose: by mouth, anxiety, l0mg 3 times daily increased in severe cases to 60-100mg daily in divided doses. Reduce in elderly and debilitated patients to half adult dose.
Child- not recommended.

- *Librium Tablets 10, 25 mg*

DIAZEPAM

Indications: anxiety, insomnia, adjunctive treatment of acute alcohol withdrawal; epilepsy; febrile convulsions; muscle spasm; peri-operative use.
Cautions: may alter reaction time and patient's ability to drive or operate machinery. respiratory disease, muscle weakness and myasthenia gravis, history of drug or alcohol abuse, marked personality disorder, pregnancy, breast-feeding, reduce dose in elderly and debilitated, and in hepatic impairment (avoid if severe), renal impairment; avoid prolonged use (and abrupt withdrawal thereafter);

porphyria; when given parenterally, close observation required until full recovery from sedation.
Contra-indications: respiratory depression; marked neuromuscular respiratory weakness including unstable myasthenia gravis; acute pulmonary insufficiency; sleep apnoea syndrome; severe hepatic impairment; not for chronic psychosis; should not be used alone in depression or in anxiety with depression; avoid injections containing benzyl alcohol in neonates
Side Effects: drowsiness and lightheadedness the next day; confusion and ataxia (especially in the elderly); amnesia; dependence; paradoxical increase in aggression; muscle weakness; *occasionally:* headache, vertigo, hypotension, salivation changes, gastro-intestinal disturbances, visual disturbances, dysarthria, tremor, changes in libido, incontinence, urinary retention; blood disorders and jaundice; skin reactions; on intravenous injection, pain, thrombophlebitis, and rarely apnoea.
Dose: by mouth, anxiety, 2 mg 3 times daily increased in severe anxiety to 15-30 mg daily in divided doses.
Elderly patients, half adult dose.
Child in night terrors and somnambulism 1-5 mg daily at bedtime.
Insomnia associated with anxiety - 5-15 mg at bedtime.
By IM or slow IV injection, (at a rate of not more than 5mg/minute), for severe anxiety, control of acute panic attacks, and acute alcohol withdrawal, 10 mg repeated if necessary after 4 hours.
By IV infusion, max. of 3 mg/kg over 24 hours.

- *Valium Tablets 5 mg.*
- *Valium Injection 10 mg/2 ml.*
- *Diazepam Retal Tube 5mg/ Tube.*

Approximate equivalent doses, diazepam 5 mg
≡chlordiazepoxide 15 mg
≡loprazolam 0.5–1 mg
≡lorazepam 500 mcg
≡lormetazepam 0.5–1 mg
≡nitrazepam 5 mg
≡oxazepam 15 mg
≡temazepam 10 mg

LORAZEPAM

Indications: insomnia (short term use)

Cautions: see under Nitrazepam
Contra-indications: see under Nitrazepam
Side Effects: see under Nitrazepam, short acting
Dose: 1 mg at bedtime, increased to 1.5 or 2 mg if required; ELDERLY (or debilitated) 0.5 or 1 mg; CHILD not recommended

- *Ativan Tablets 2 mg*
- *Lorazepam 4mg Injection*

MIDAZOLAM

Indications: sedation with amnesia; sedation in intensive care; premedication, induction of anaesthesia; status epilepticus
Cautions: cardiac disease; respiratory disease; myasthenia gravis; children ***(***particularly if cardiovascular impairment); history of drug or alcohol abuse; reduce dose in elderly and debilitated; avoid prolonged use ***(***and abrupt withdrawal thereafter); concentration of midazolam in children under 15 kg not to exceed 1 mg/ml; hepatic impairment; renal impairment
Contra-indication: marked neuromuscular respiratory weakness including unstable myasthenia gravis; severe respiratory depression; acute pulmonary insufficiency
Side Effects: gastro-intestinal disturbances, increased appetite, jaundice; hypotension, cardiac arrest, heart rate changes, anaphylaxis, thrombosis; laryngospasm, bronchospasm, respiratory depression and respiratory arrest ***(***particularly with high doses or on rapid injection); drowsiness, confusion, ataxia, amnesia, headache, euphoria, hallucinations, fatigue, dizziness, vertigo, involuntary movements, paradoxical excitement and aggression ***(***especially in children and elderly), dysarthria; urinary retention, incontinence, changes in libido; blood disorders; muscle weakness; visual disturbances; salivation changes; skin reactions; on *intravenous injection*, pain, thrombophlebitis
Central nervous system ***(***CNS) depressants or alcohol—The CNS depressant and other effects of alcohol, other medicines, or midazolam may be increased; also, the effects of midazolam may last longer
Saquinavir—Saquinavir may interfere with the removal of midazolam from the body, which could lead to serious side effects

Dose: Sedation, by slow intravenous injection, 70-100 mcg/kg 30-60 minutes before surgery. Usual dose 5 mg (2.5 mg in elderly patients) Induction, by slow intravenous injection, 200-300 mcg/kg *(*elderly patients 100-200 mcg/kg).
Pregnancy: Midazolam is not recommended for use during pregnancy because it may cause birth defects; use of midazolam during pregnancy, especially during the last few days, may cause drowsiness, slow heartbeat, shortness of breath, or troubled breathing in the newborn infant. In addition, receiving midazolam just before or during labor may cause weakness in the newborn infant.
Breast feeding: Midazolam passes into human breast milk

- *Dormicum 15 mg/3 ml Injection*

NITRAZEPAM

Indications: insomnia where daytime sedation is acceptable.
Cautions: respiratory disease, muscle weakness and myasthenia gravis, history of drug or alcohol abuse, marked personality disorder, pregnancy, breast-feeding; reduce dose in elderly and debilitated, and in hepatic impairment (avoid if severe) and renal impairment; avoid prolonged use (and abrupt withdrawal thereafter); porphyria;
Contra-indications: respiratory depression; marked neuromuscular respiratory weakness including unstable myasthenia gravis; acute pulmonary insufficiency; severe hepatic impairment; sleep apnoea syndrome; not for use alone to treat depression (or anxiety associated with depression) or chronic psychosis
Side Effects: drowsiness and light-headedness the next day; confusion and ataxia (especially in the elderly); amnesia may occur; dependence.
Dose: 5-10 mg (elderly 2.5-5 mg) 30 minutes before bedtime. Child, 2.5-5 mg.

- *Mogadon Tablets 5 mg*

PROMETHAZINE HYDROCHLORIDE

Indications: pre-medication; mild insomnia, sedation.
Cautions &Contra-indications: prostatic hypertrophy, urinary retention, susceptibility to angle closure

glaucoma, pyloroduodenal obstruction, hepatic & renal disease, pregnancy, breast feeding.
epilepsy, porphyria
Side Effects: drowsiness, headache, psychomotor impairment, antimuscarinic effects like urinary retention, dry mouth, blurred vision, GI disturbances.
Dose: by mouth, 25-50 mg at bedtime.
Child- below 2 years not recommended; 2-5 years, 15-20 mg; 5-10 years, 20-25mg, all at bed time
For daytime sedation, once or twice daily using the lower dose.

- *Phenergan Tablet 25 mg*
- *Phenergan Injection 50 mg/2 ml*

ANTIPSYCHOTIC DRUGS

ATYPICAL ANTIPSYCHOTIC DRUGS

CLOZAPINE

Indications: schizophrenia (including psychosis in Parkinson's disease) in patients unresponsive to, or intolerant of, conventional antipsychotic drugs.
Cautions: cardiovascular disease; history of epilepsy; accompanied by strict procedures for the monitoring of white blood-cell counts for the first 18 weeks then at least fortnightly; bone-marrow; elderly; monitor leucocyte and differential blood counts; prostatic hypertrophy, susceptibility to angle-closure glaucoma; taper off other antipsychotics before starting; close medical supervision during initiation (risk of collapse because of hypotension); hepatic impairment; pregnancy. Clozapine should be used cautiously with drugs which cause constipation (e.g. antimuscarinic drugs) or in history of colonic disease or bowel surgery.
Contra-indications: severe cardiac disorders (e.g. myocarditis); severe renal impairment; history of neutropenia or agranulocytosis; bone-marrow disorders; paralytic ileus; alcoholic and toxic psychoses; history of circulatory collapse; drug intoxication; coma or severe CNS depression; uncontrolled epilepsy; breast-feeding; history of concurrent use of co-trimoxazole, chloramphenicol, sulphonamides, penicillamine,

carbamazepine or anti neoplastics with high bone marrow suppression risk.
Side Effects: sedation; antimuscarinic symptoms; extra pyramidal symptoms; neutropenia and potentially fatal agranulocytosis; headache; dizziness, hyper salivation, urinary incontinence, priapism, pericarditis, myocarditis, and delirium; nausea and vomiting; hyperglycemia, hypertension; rarely circulatory collapse.
Dose: under close medical supervision on first day, 12.5 mg once or twice.
On second day, 25-50 mg; then slowly increased if well tolerated by 25-50mg over 2-3 weeks to 300 mg daily in divided doses.
The larger dose (up to 200 mg as single dose daily) is taken at bed time.
If necessary, the dose may be increased by 50-100 mg once or twice weekly to a max. of 900 mg daily.
Usual antipsychotic dose, 200-450 mg daily.
Subsequent adjustment to the usual maintenance dose of 150-300mg.
Child, not recommended.
Elderly and special risk group, first day, 12.5 mg once.
Subsequent adjustment restricted to 25mg daily in slow and small steps in case of epileptic seizures, suspend for 24 hours and resume at lower dose.
Restarting the treatment after interval of more than 2 days, 12.5mg once or twice on first day and could be increased more quickly than initial therapy.

- *Lepnex Tablets 25 mg, 100 mg*

ARIPIPRAZOLE

Indications: Schizophrenia, Treatment and recurrence prevention of mania
Cautions: cerebrovascular disease; elderly (reduce initial dose)
Breast-feeding: avoid—present in milk
Contra-indications: hepatic impairment use with caution in severe impairment
Pregnancy: use only if potential benefit outweighs risk
Breast-feeding: manufacturer advises avoid—present in milk
Side Effects: hypersalivation, anxiety, drowsiness, malaise; less commonly depression, dry mouth; *also*

reported anorexia, oropharyngeal spasm, laryngospasm, respiratory disorders (including infection), hepatitis, pancreatitis, bradycardia, pathological gambling, suicidal ideation, hyponatraemia, urinary disorders, myalgia, rhabdomyolysis, oedema, sweating, alopecia
Dose: Schizophrenia, by mouth, ADULT over 18 years, 10–15 mg once daily, usual maintenance 15 mg once daily; max. 30 mg once daily; for dose adjustments due to concomitant use of interacting drugs, ; Treatment and recurrence prevention of mania, by mouth, ADULT over 18 years, 15 mg once daily, increased if necessary; max. 30 mg once daily; for dose adjustments due to concomitant use of interacting drugs, ;

- *Abilify Tablet 15 mg*

OLANZAPINE

Indication: Schizophrenia, mono or combination therapy for mania;
Cautions: Increased risk of stroke in elderly patients with dementia; concomitant administration of drugs that prolong QT intervals; pregnancy; hepatic impairment; renal impairment; cardiovascular disease; history of epilepsy and Parkinson's disease; also prostatic hypertrophy, susceptibility to angle-closure glaucoma, paralytic ileus, diabetes mellitus (risk of exacerbation or ketoacidosis), low leucocyte or neutrophil count, bone-marrow depression, hypereosinophilic disorders, myeloproliferative disease,
Contra-indications: Breast feeding, *For injection* acute myocardial infarction, unstable angina, severe hypotension or bradycardia, sick sinus syndrome, recent heart surgery.
Side Effect: mild & transient antimuscarenic effects, drowsiness, speech difficulties, exacerbation of Parkinson's disease, abnormal gait, hallucinations, akathisia, asthenia, increased appetite, increased body temperature, increased triglycerides conc. edema, hyperprolactinemia, urinary incontinence; eosinophilia; less commonly hypotension, bradycardia, QT interval prolongation, photosensitivity; rarely seizures, leucopenia, rash; very rarely thromboembolism, hypercholesterolaemia, hypothermia, urinary retention, priapism, thrombocytopenia, neutropenia,

rhabdomyolysis, hepatitis, pancreatitis; with injection, injection-site reactions, sinus pause, hypoventilation
Dose: Schizophrenia, Combination therapy for mania Adult over 18 years 10 mg daily to Max.20 mg daily Monotherapy of mania***:*** 15 mg daily to Max. dose 20 mg daily

- *Zyprexa Tablets 5 mg*

PALIPERIDONE

Indications: schizophrenia; psychotic or manic symptoms of schizoaffective disorder
Cautions: predisposition to gastro-intestinal obstruction; elderly patients with dementia and risk factors for stroke; prolactin-dependent tumours; cataract surgery (risk of intraoperative floppy iris syndrome)
Breast-feeding: avoid—present in milk
Contra-indications: hepatic impairment caution in severe impairment
Renal impairment: initially 3 mg once daily if eGFR 50–80 ml/minute/1.73 m^2 (max. 6 mg once daily); initially 1.5 mg once daily if eGFR 10–50 ml/minute/1.73 m^2 (max. 3 mg once daily); avoid if eGFR less than 10 ml/minute/1.73 m^2
Pregnancy: use only if potential benefit outweighs risk—toxicity in animal studies; if discontinuation during pregnancy is necessary, withdraw gradually
Side Effects: hypertension, respiratory disorders (including infection), epistaxis, appetite changes, sleep disorders, anxiety, depression, malaise, urinary disorders, arthralgia, myalgia, toothache, oedema; less commonly hypoaesthesia, paraesthesia, taste disturbances, elevated plasma-triglyceride and -cholesterol concentrations, visual disorders, tinnitus, alopecia; *rarely* intestinal obstruction, pancreatitis, pulmonary embolism, inappropriate antidiuretic hormone secretion, rhabdomyolysis, intra-operative floppy iris syndrome
Dose: ADULT over 18 years, 6 mg once daily in the morning, adjusted if necessary in increments of 3 mg over at least 5 days; Always take with breakfast or always take on an empty stomach By deep intramuscular injection into the deltoid muscle, 150 mg on day 1, then 100 mg on day 8, then adjusted at monthly intervals according to response; Following the second dose, monthly

maintenance doses can be administered into either the deltoid or gluteal muscle; for missed doses see product literature
Maintenance, Oral usual range 3–12 mg daily
recommended maintenance dose 75 mg (range 50–150 mg) monthly

- *Invega 3 mg, 6 mg Tablets*
- *Invega sustainna (Prefilled syringe) 50mg/0.5 ml, 100 mg/0.5ml*

QUETIAPINE

Indications: schizophrenia; mania, either alone or with mood stabilisers; depression in bipolar disorder; adjunctive treatment in major depressive disorder
Cautions: cerebrovascular disease; patients at risk of aspiration pneumonia; treatment of depression in patients under 25 years (increased risk of suicide
Contra-indications: cerebrovascular disease; patients at risk of aspiration pneumonia; treatment of depression in patients under 25 years (increased risk of suicide
Hepatic impairment: for *immediate-release tablets*, initially 25 mg daily, increased daily in steps of 25–50 mg; for *modified-release tablets*, initially 50 mg daily, increased daily in steps of 50 mg.
Pregnancy: use only if potential benefit outweighs risk
Breast-feeding: manufacturer advises avoid
Side Effects: dyspnea, elevated plasma-triglyceride and -cholesterol concentrations, peripheral oedema, increased appetite, sleep disorders, irritability, dysarthria, asthenia; less commonly rhinitis, restless legs syndrome, hyponatraemia, hypothyroidism; *rarely* pancreatitis, hepatitis; very rarely inappropriate secretion of antidiuretic hormone, rhabdomyolysis, angioedema, Stevens-Johnson syndrome; *also reported* suicidal behaviour (particularly on initiation), toxic epidermal necrolysis
Dose: Schizophrenia, ADULT over 18 years, 25 mg twice daily on day 1, 50 mg twice daily on day 2, 100 mg twice daily on day 3, 150 mg twice daily on day 4, then adjusted according to response, usual range 300–450 mg daily in 2 divided doses; max. 750 mg daily; CHILD : Not recomended Treatment of mania in bipolar disorder, ADULT over 18 years, 50 mg twice daily on day 1, 100 mg

twice daily on day 2, 150 mg twice daily on day 3, 200 mg twice daily on day 4, then adjusted according to response in steps of up to 200 mg daily to max. 800 mg daily; usual range 400–800 mg daily in 2 divided doses; Treatment of depression in bipolar disorder, ADULT over 18 years, 50 mg once daily (at bedtime) on day 1, 100 mg once daily on day 2, 200 mg once daily on day 3, 300 mg once daily on day 4; adjust according to response, usual dose 300 mg once daily, max. 600 mg daily Prevention of mania and depression in bipolar disorder, ADULT over 18 years, continue at the dose effective for treatment of bipolar disorder and adjust to lowest effective dose; usual range 300–800 mg in 2 divided doses
Note*:* The rate of dose titration may need to be slower and the daily dose lower in elderly patients,

- *Seroquel Tablet 25mg, 50 mg XR, 300 mg XR*

RISPERIDONE

Indications: acute and chronic psychoses, in which both positive and negative symptoms are prominent.
Cautions: pregnancy; hepatic impairment; renal impairment; concomitant administration of drugs that prolong QT intervals; cardiovascular disease; history of epilepsy and Parkinson's disease; epilepsy; Increased risk of stroke in elderly patients with dementia.
Contra-indications: breast-feeding.
Side Effects: weight gain; dizziness; insomnia, headache, decreased concentration; postural hypotension; fatigue; blurred vision; rash; gastro-intestinal disturbances; thrombocytopenia; seizures; abnormal temperature regulation; priapism, urinary incontinence.
Dose: *2* mg in 1-2 divided doses on first day then 4 mg in 1-2 divided doses on second day then 6 mg in 1-2 divided doses on third day.
Usual range, 4-8 mg daily.
Max. dose is 16 mg daily (doses above 10 mg only if benefit outweighs risk)
Elderly, initially 500 mcg twice daily.
Maintenance, 1 -2 mg twice daily.

- *Risperdal Tablets 2, 4 mg, Liquid 1 mg / ml*

SERTINDOLE

Indications: Schizophrenia
Cautions: Hepatic impairment, correct hypokalemia or hypomagnesaemia befpr treatment, monitor ECG during treatment. monitor blood pressure during dose titration and early maintenance therapy
Contra-indications: Sever hepatic impairment, QT interval prolongation (ECG required before and during treatment uncorrected hypokalaemia and hypomagnesaemia.
Side Effects: Prolonged QT interval, peripheral oedema, dry mouth, rhinitis, nasal congestion, dyspnoae, paraesthesia, abnormal ejaculation (decreased volume), hyperglycaemia
Dose: Initially 4 mg daily increased in steps of 4 mg at intervals of 4-5 days to usual maintenance of 12-20 mg as a single daily dose, max.24 mg daily.
Elderly***:*** consider slow dose titration and lower maintenance dose.
Child and adolescent***:*** not recommended.
Serdolect Tablet4 mg, 16mg

- *Serdolect Tablet 4 mg, 16mg*

TYPICAL ANTIPSYCHOTIC DRUGS

CHLORPROMAZINE HYDROCHLORIDE

Warning: Owing to the risk of contact sensitisation, pharmacists, nurses, and other health workers should avoid direct contact with chlorpromazine; tablets should not be crushed and solutions should be handled with care.
Indications: schizophrenia and related psychoses, adjunct in severe anxiety, as anti-emetic in terminal diseases, hiccup, tranquilization and emergency control in behavioral disturbances.
Cautions: cardiovascular disease, phaeochromocytoma, parkinsonism, acute infections, epilepsy.
Special Precautions: patient should remain in the supine position for 30 minutes after IM injection; bone marrow depression, respiratory, renal and hepatic diseases;
Pregnancy: and breast feeding; elderly susceptible to postural hypotension.

Contra-indications: comatose patients, CNS depression; bone-marrow depression; closed-angle glaucoma.
Side Effects: extrapyramidal symptoms; dystonia and dyskinesia; tardive dykinesia; hypothermia, drowsiness, apathy, pallor, nightmares; insomnia, depression and rarely agitation; cardiovascular symptoms; antimuscarinic effects; endocrine effects; sensitivity reactions; corneal and lens opacities after prolonged use.
Dose: by mouth, psychoses and severe anxiety, initially 25 mg 3 times daily or 75 mg at bedtime (may be doubled in bed-patients), adjusted according to response to 1 g or more in psychoses. Usual maintenance dose, 75-300 mg daily.
Child up to 5 years, 5-10 mg up to 3 times daily; 6-12 years, 1/3-1/2 adult dose.
Intractable hiccup, 25-50 mg 3-4 times daily. Tablets should be swallowed whole.
Child's dose, as oral dose.

- *Largactil Tablets 100 mg*

FLUPENTIXOL (Flupenthixol))

Indications: maintenance in schizophrenia and related psychoses particularly with apathy but not mania or psychomotor hyperactivity; anxiety.
Cautions: with the high doses, periodic blood counts are needed. Another antipsychotic drug should be used if agitation or aggression appears; porphyria. Hepatic & renal impairment, cardiovascular disease, Parkinson's disease, epilepsy.
Contra-indications: excitable or overactive patients.
Side Effects: extra pyramidal symptoms consisting of parkinsonian symptoms, dystonia, dyskinesia, restlessness, tardive dyskinesia.
Dose: Deep IM injection into the gluteal muscle, test dose 20 mg then after 5-10 days 20-40 mg repeated at intervals of 2-4 weeks, adjusted according to the, response; max. 400 mg weekly. usual maintenance dose 50 mg every 4 weeks to 300 mg every 2 weeks; ELDERLY initially quarter to half adult dose;

- *Depixol Injection 40 mg /2 ml; 100 mg / 2 ml*

FLUPHENAZINE DECANOATE

Indications: maintenance in schizophrenia and related psychoses.
Cautions: with the high doses, periodic blood counts are needed. Another antipsychotic drug should be used if agitation or aggression appears; porphyria. hepatic & renal impairment, cardiovascular disease, Parkinson's disease, epilepsy.
Contra-indications: severely depressed states; marked cerebral atherosclerosis.
Side Effects: extra pyramidal symptoms consisting of parkinsonian symptoms, dystonia, dyskinesia, restlessness, tardive dyskinesia; systemic lupus erythematosus, inappropriate antidiuretic hormone secretion, oedema.
Dose: deep IM injection into the gluteal muscle, test dose 12.5 mg (6.25 mg in elderly), then after 4-7 days 12.5-100 mg repeated at intervals of 14-35 days, adjusted according to the response.

- *Modecate Injection 25 mg / ml In 1 ml Vial, 100 mg / 1 ml*

HALOPERIDOL

Indications: schizophrenia and related psychoses, particularly mania; tranquillization and emergency control in behavioral disturbances; short-term adjunctive treatment of severe anxiety; motor tics, hiccups.
Cautions: thyrotoxic patients, basal ganglia disease; subarachnoid haemorrhage and metabolic disturbances such as hypokalaemia, hypocalcaemia, or hypomagnesaemia
hepatic impairment, renal impairment, cardiovascular disease, Parkinson's disease (may be exacerbated by antipsychotics), epilepsy (and conditions predisposing to epilepsy), depression, myasthenia gravis, prostatic hypertrophy, or a susceptibility to angle-closure glaucoma; severe respiratory disease and in patients with a history of jaundice; elderly, who are particularly susceptible to postural hypotension and to hyper- or hypothermia in very hot or cold weather; thyrotoxic patients, basal ganglia disease; subarachnoid

haemorrhage and metabolic disturbances such as hypokalaemia, hypocalcaemia, or hypomagnesaemia.
Contra-indications: comatose states, CNS depression, and phaeochromocytoma, pregnancy (unless essential); breast-feeding during treatment.
Side Effects: extra pyramidal symptoms consisting dystonia & akathesia particularly in thyrotoxic patients. Rarely weight loss, hypoglycaemia, inappropriate antidiuretic hormone secretion.
Dose: schizophrenia, psychoses mania, short term management of psychomotor agitation, excitement, and violent or dangerously impulsive behavior, initially 1.5-3 mg 2-3 times daily.
Severly affected or resistant patients, 3-5 mg 2-3 times daily.
Resistant schizophrenia, up to 30 mg daily; then adjusted according to response to lowest maintenance dose as low as 5-10 mg daily.
Elderly or debilitated patients, initially half adult dose.
Child, initially 25-50 mcg/kg daily in 2 divided doses to max. of 10 mg.
Severe anxiety, adults, 500 mcg twice daily.
Child not recommended.
By IM or IV injection, 2-10 mg, subsequent doses being given every 4-8 hours, according to response (up to every hour if necessary) to max. 60 mg.
Severely disturbed patients may require initial dose up to 18 mg.
Child not recommended.
Intractable hiccup – 1.5 mg 3 times daily.
Nausea and vomiting, 0.5-2 mg by IM or IV injection; 1 mg 3 times daily orally.

- *Serenace Tablets 1.5, 5 mg*
- *Haldol Injection 5 mg/ml*
- *Haldol Drops 2 mg/1 ml- 15 ml Bottles*

HALOPERIDOL DECANOATE

This is used for maintenance therapy especially when compliance with oral treatment is unreliable.
Indications: maintenance in schizophrenia and other psychoses.
Cautions, Contra-indications: & Side Effects: As for haloperidol

Dose: by deep IM injection into the gluteal muscle, initially 50 mg every 4 weeks, if necessary increasing after 2 weeks by 50mg increments to 300 mg every 4 weeks. Higher doses may be needed in some patients.
Elderly, initially 12.5-25 mg every 4 weeks.
Child, not recommended.

- *Haldol Decanoate Injection 50 mg/1 ml In Sesame Oil*

SULPRIDE

Indications: schizophrenia.
Cautions: cardiovascular and respiratory diseases; pregnancy; infections; renal and hepatic impairment. also excited, agitated, or aggressive patients (even low doses may aggravate symptoms)
Avoid abrupt withdrawal.
Contra-indications: phaeochromocytoma, parkinsonism. also porphyria
Side Effects: Palpitation, hypertension; Dizziness, headache, neuroleptic malignant syndrome, sedation, tardive dyskinesia, galactorrhea, sexual dysfunction, nausea, vomiting, constipation, impotence, cholestatic jaundice, blurred vision,
Dose: 200-400 mg twice daily; max. 800 mg daily in patients with predominantly negative symptoms, and 2.4 g daily in patients with mainly positive symptoms; elderly, initially 100-200 mg daily.

- *Dogmatil Tablets 50 mg*

TRIFLUOPERAZINE

Indications: schizophrenia and related psychoses, tranquillization in behavioral disturbances, adjunct in severe anxiety.
Cautions: hepatic & renal impairment, Parkinson's disease, epilepsy; cardiovascular disease; depression; myasthenia gravis, prostatic hypertrophy, or a susceptibility to angle-closure glaucoma; in severe respiratory disease and in patients with a history of jaundice or who have blood dyscrasias (perform blood counts if unexplained infection or fever develops), elderly, who are particularly susceptible to postural hypotension and to hyper- or hypothermia in very hot or

cold weather, As photosensitisation may occur with higher dosages, patients should avoid direct sunlight.
Contra-indications: in comatose states, CNS depression, and phaeochromocytoma; pregnancy, unless essential; during breast-feeding.
Side Effects: extra pyramidal symptoms consisting dystonias, more frequent; respiratory depression may occur in susceptible individuals; pancytopenia; thrombocytopenia; hyperpyrexia; anorexia.
Dose: by mouth, psychoses, initially 5 mg twice daily or 10 mg daily in modified-release form, increased by 5 mg after 1 week, then at intervals of 3 days, according to response.
Child up to 12 years, initially 5 mg daily in divided doses.
Severe anxiety, 2-4 mg daily in divided doses or 2-4 mg daily in slow release form, increased if necessary to 6 mg daily.
Child 3-5 years, up to 1 mg daily;
6-12 years, up to 4 mg daily in divided doses.

- *Stelazine Tablets 1mg, 5 mg*

ZUCLOPENTHIXOL ACETATE

Indications: long term management of acute psychosis, mania, or exacerbation of chronic psychosis.
Cautions: porphyria; severe cardiac, respiratory, hepatic or renal disease; in patients with decreased gastrointestinal motility, urinary retention, BPH,
Contra-indications: Acute intoxication with ethanol, barbiturate or opioid, severe CNS depression; coma; sub cortical brain damage, circulatory collapse, blood dyscrasiasa, pheochromocytoma.
Side Effects: drowsiness; anxiety, insomnia, akathisia, extrapyrmidal effects, dizziness, xerostomaia, decreased libido, hypertonia, tremor, weakness.
Dose: by deep IM injection into the gluteal muscle or lateral thigh, 50-150 mg repeated after 2-3 days if necessary. Elderly, 50-100 mg repeated after 2-3 days if necessary. One additional dose may be needed 1 -2 days after the first injection.
Max. cumulative dose, 400 mg per course and max. 4 injections. For necessary maintenance therapy, give oral antipsychotic 2-3 days after last injection or give long antipsychotic depot injection concomitantly with last

injection of Zuclopenthixol acetate. Child, not recommended

- *Clopixol Acuphase Injection 50 mg/ml*

ZUCLOPENTHIXOL DIHYDROCHLORIDE

Indications: schizophrenia and other psychoses, particularly when associated with agitated, aggressive or hostile behavior.
Cautions: Same as for injection.
Contra-indications: same as for injection.
Side Effects: same as for injection.
Dose: initially, 20-30 mg daily in divided doses increased to a max. of 100 mg daily if necessary. Usual maintenance dose, 20-40 mg/day.
Child, not recommended.

- *Clopixol Tablets 10 mg*

ANTIDEPRESSANT DRUGS

Antidepressant drugs are effective in the treatment of major depression of moderate and severe degree including major depression associated with physical illness and that following childbirth; they are also effective for dysthymia (lower grade chronic depression). Antidepressant drugs are not generally effective in milder forms of acute depression but a trial may be considered in cases refractory to psychological treatments.
The major classes of antidepressants include the tricyclics and related antidepressants, the selective serotonin re-uptake inhibitors (SSRIs), and the monoamine oxidase inhibitors (MAOIs). Choice of antidepressant should be based on the individual patient's requirements, including the presence of concomitant disease, existing therapy, suicide risk, and previous response to antidepressant therapy.

AGOMELATINE

a melatonin receptor agonist and a selective serotonin-receptor antagonist
Indications: treatment of major depressive disorder
Cautions: bipolar disorder, mania or hypomania; concomitant use of drugs associated with hepatic injury; excessive alcohol consumption; obesity; diabetes; non-

alcoholic fatty liver disease; dose adjustment may be necessary if smoking started or stopped during treatment.
Hepatotoxicity
Hepatic injury, including hepatitis and hepatic failure reported rarely; test liver function before treatment and after 3, 6, 12 and 24 weeks of treatment, and then as appropriate (restart monitoring schedule if dose increased); discontinue if serum transaminases exceed 3 times the upper limit of reference range or symptoms of liver disorder.
Contra-indications: dementia; patients over 75 years of age; see also Hepatotoxicity above
Hepatic impairment: avoid***, renal impairment*** caution in moderate to severe impairment,
Pregnancy: manufacturer advises avoid
Breast-feeding: avoid—present in milk in *animal* studies
Side Effects: nausea, vomiting, diarrhoea, constipation, abdominal pain, increased serum transaminases (see Hepatoxicity above), headache, dizziness, drowsiness, agitation, sleep disturbances, fatigue, anxiety, back pain, sweating; less commonly paraesthesia, restless legs syndrome, blurred vision, tinnitus, eczema; *rarely* hepatitis, hepatic failure (see Hepatotoxicity above), weight changes, rash; suicidal behaviour) and pruritus also reported
Dose: ADULT over 18 years, 25 mg at bedtime, increased if necessary after 2 weeks to 50 mg at bedtime

- *Valdoxan Tablet 25 mg*

ANTIDEPRESSANT.- TRICYCLIC

AMITRIPTYLINE HYDROCHLORIDE

Indications: depressive illness, particularly where sedation is required; nocturnal enuresis in children; neuropathic pain); migraine prophylaxis
Cautions*;* sedation may affect patient's responses. Avoid abrupt cessation of therapy, epilepsy; pregnancy and breast-feeding, hepatic impairment, thyroid disease, anesthesia, diabetes; alcohol intake, psychosis; susceptibility to angle-closure glaucoma; history of urinary retention; concurrent electroconvulsive therapy; porphyria.

Contra-indications: recent myocardial infarction, heart block, mania; severe liver disease.
Side Effects: antimuscarinic effects- dry mouth, sedation, blurred vision (disturbance of accommodation, increased intra-ocular pressure), constipation, nausea, difficulty with micturition; cardiovascular side effects ***(***such as ECG changes, arrhythmias, postural hypotension, tachycardia, syncope, particularly with high doses); sweating, tremor, rashes and hypersensitivity reactions (including urticaria, photosensitivity), behavioural disturbances (particularly children), hypomania or mania, confusion or delirium (particularly elderly), headache, interference with sexual function, blood sugar changes; increased appetite and weight gain (occasionally weight loss); endocrine side effects such as testicular enlargement, gynaecomastia, galactorrhoea; also convulsions, movement disorders and dyskinesias, dysarthria, paraesthesia, taste disturbances, tinnitus, fever, agranulocytosis, leucopenia, eosinophilia, purpura, thrombocytopenia, hyponatraemia, abnormal liver function tests (jaundice);
Dose: by mouth, initially 50-75 mg (elderly and adolescents 30- 75 mg) daily in divided doses, or as a single dose at bedtime, increased gradually as necessary to a max. of 150-200 mg.
Maintenance dose, 50-100 mg daily;
Nocturnal enuresis, child 7-10 years, 10-20 mg; 11-16 years, 25-50 mg half an hour before bedtime for up to 3 months (including gradual withdrawal).

- *Tryptizol Tablets 10, 25, 50 mg.*

BUPROPION HYDROCHLORIDE

Indications: *treatment of major depressive disorder*
Cautions: elderly; predisposition to seizures (prescribe only if benefit clearly outweighs risk) including concomitant use of drugs that lower seizure threshold, alcohol abuse, history of head trauma, and diabetes; measure blood pressure before and during treatment.
Contra-indications: acute alcohol or benzodiazepine withdrawal; severe hepatic cirrhosis; CNS tumour; history of seizures, eating disorders, or bipolar disorder
Hepatic impairment: reduce dose to 150 mg daily; avoid in severe hepatic cirrhosis

Renal impairment: reduce dose to 150 mg daily
Pregnancy: avoid—no information available
Breast-feeding: present in milk—avoid
Side Effects: dry mouth, gastro-intestinal disturbances, taste disturbance; agitation, anxiety, dizziness, depression, headache, impaired concentration, insomnia (reduced by avoiding dose at bedtime), tremor; fever; pruritus, rash, sweating; less commonly chest pain, flushing, hypertension, tachycardia, anorexia, asthenia, confusion, tinnitus, and visual disturbances; *rarely* hepatitis, jaundice, palpitation, postural hypotension, vasodilatation, abnormal dreams, ataxia, dystonia, depersonalisation, hallucinations, hostility, incoordination, irritability, impaired memory, paraesthesia, seizures, twitching, blood-glucose changes, urinary frequency, urinary retention, exacerbation of psoriasis, and Stevens-Johnson syndrome; very rarely aggression, delusions, paranoid ideation, and restlessness; also reported suicidal ideation
Dose: ADULT over 18 years, start 1–2 weeks before target stop date, initially 150 mg daily for 6 days then 150 mg twice daily (max. single dose 150 mg, max. daily dose 300 mg; minimum 8 hours between doses); period of treatment 7–9 weeks; discontinue if abstinence not achieved at 7 weeks; consider max. 150 mg daily in patients with risk factors for seizures; ELDERLY max. 150 mg daily

- *Wellbutrin XL Tablet 150 mg*

CLOMIPRAMINE HYDROCHLORIDE

This is a tricyclic antidepressant.
Indications: depressive illness; phobia and obsession; adjunct drug in cataplexy associated with narcolepsy.
Cautions & ***Contra-indications:*** see under Amitriptyline Hydrochloride
Side Effects: see under Amitriptyline Hydrochloride; also diarrhoea; hair loss reported
Dose: by mouth, initially 10 mg daily, increased gradually as necessary to 30-150 mg or more in severe depression and in phobic and obsessional states, in divided doses or as single dose at bedtime.
Elderly patients, 10 mg daily increased to 30-75 mg.

- *Anafranil Tablets 25, 75 mg*

IMIPRAMINE HYDROCHLORIDE

This is a tricyclic antidepressant.
Indications: depressive illness, nocturnal enuresis in children.
Cautions, Contra-indications, Side Effects: see under Amitryptyline HCl
Dose: initially 75 mg daily in divided doses or as a single dose at bedtime increased gradually to 200 mg (up to 225 mg in hospitalized patients); up to 150 mg may be given as a single dose at bedtime;
Maintenance dose, 75-100 mg daily
Elderly patients, 10-25 mg 1-3 times daily.
Nocturnal enuresis, child 6-7 years, 25 mg;
8-11 years, 25-50 mg;
Over 11 years, 50-75 mg at bedtime;
Max. period of treatment (including gradual withdrawal) should not exceed 3 months.

- *Tofranil Tablets 10, 25 mg*

SELECTIVE SEROTONINE AND NOREPINPHRINE REUPTAKE INHIBITORS (SNRI)

DESVENLAFAXINE

Indications: treatment of major depressive disorder
Cautions: pregnancy Based on animal data, may cause fetal harm Nursing Mothers***:*** Discontinue drug or nursing taking into consideration importance of drug to mother Geriatric Use***:*** There is an increased incidence of orthostatic hypotension in desvenlafaxine treated patients ≥ 65 years
Contra-indications: Hypersensitivity to desvenlafaxine succinate, venlafaxine hydrochloride or to any excipients. The use of MAOIs intended to treat psychiatric disorders with Desvelafaxine or within 7 days of stopping treatment with Desvelafaxine is contraindicated because of an increased risk of serotonin syndrome. The use of Desvelafaxine within 14 days of stopping an MAOI intended to treat psychiatric disorders is also contraindicated
Side Effects: nausea, dizziness, insomnia, hyperhidrosis, constipation, somnolence, decreased appetite, anxiety, and specific male sexual function disorders

Dose: Recommended dose 50 mg once daily with or without food There was no evidence that doses greater than 50 mg per day confer any additional benefit Discontinuation***:*** Reduce dose gradually whenever possible Take tablets whole; do not divide, crush, chew, or dissolve Moderate renal impairment Max. dose 50 mg per day Severe renal impairment and end-stage renal disease***:*** Max. dose 50 mg every other day Moderate to severe hepatic impairment Max. dose 100 mg per day.

- *Pristiq Tablet 50 mg*

DULOXETINE

Indications: major depressive disorder; generalised anxiety disorder; diabetic neuropathy stress urinary incontinence)

Cautions: elderly; cardiac disease; hypertension (avoid if uncontrolled); history of mania; history of seizures; raised intra-ocular pressure, susceptibility to angle-closure glaucoma; bleeding disorders or concomitant use of drugs that increase risk of bleeding.

Contra-indications: hepatic impairment renal impairment avoid if eGFR less than 30 ml/minute/1.73 m^2, pregnancy toxicity in *animal* studies—avoid in patients with stress urinary incontinence; risk of neonatal withdrawal symptoms if used near term, breast-feeding***:*** present in milk—manufacturer advises avoid

Side Effects: nausea, vomiting, dyspepsia, constipation, diarrhoea, abdominal pain, weight changes, decreased appetite, flatulence, dry mouth; palpitation, hot flush; insomnia, abnormal dreams, paraesthesia, drowsiness, anxiety, headache, dizziness, fatigue, weakness, tremor, nervousness, anorexia; sexual dysfunction; visual disturbances; sweating, pruritus; less commonly gastritis, halitosis, hepatitis, bruxism, dysphagia, tachycardia, hypertension, postural hypotension, syncope, raised cholesterol, vertigo, taste disturbance, cold extremities, impaired temperature regulation, impaired attention, movement disorders, muscle twitching, musculoskeletal pain, thirst, stomatitis, hypothyroidism, urinary disorders, and photosensitivity; *rarely* mania; very rarely angle-closure glaucoma; *also reported* supraventricular arrhythmia, chest pain, hallucinations, suicidal behaviour), seizures, hypersensitivity reactions including

urticaria, angioedema, rash (including Stevens-Johnson syndrome) and anaphylaxis, hyponatraemia (see
Dose: Major depression, ADULT over 18 years, 60 mg once daily
Generalised anxiety disorder, ADULT over 18 years, initially 30 mg daily, increased if necessary to 60 mg once daily; max. 120 mg daily
Diabetic neuropathy, ADULT over 18 years, 60 mg once daily; max. 120 mg daily in divided doses
Note : In diabetic neuropathy, discontinue if inadequate response after 2 months; review treatment at least every 3 months

- *Cymbalta Capsule 30 mg, 60 mg*

VENLAFAXINE HYDROCHLORIDE

This is a serotonin, and noradrenaline reuptake inhibitor (SNRI); it lacks the sedative and antimuscarinic effects of the tricyclic antidepressants.
Indications: depressive illness.
Cautions: may cause blood pressure increase; hepatic or renal impairment; close supervision of patients with high risk of suicidal tendencies during initial treatment; cardiac disease; history of mania. Should not be withdrawn immediately.
Contra-indications: conditions associated with high risk of cardiac arrhythmia, uncontrolled hypertension; pregnancy and breast-feeding; severe renal and hepatic impairment.
Side Effects: nausea, anorexia; sexual dysfunction; insomnia, nervousness, abnormal dreams; hypertension, palpitation; visual disturbances.
Dose: initially 75 mg daily in 2 divided doses increased if necessary after several weeks to 150 mg daily in 2 divided doses. Severly depressed or hospitalized patients, initially 150 mg daily in 2 divided doses increased if necessary in steps of up to 75 mg every 2-3 days to max. 375 mg daily then gradually reduced.

- *Efexor Tablets 75 mg XR*

SELECTIVE SEROTONIN REUPTAKE INHIBITOR (SSRI).

ESCITALOPRAM HYDROBROMIDE

This is a selective serotonin reuptake inhibitor (SSRI).
Indications: depressive illness (endogenous and non-endogenous depression) and generalizes anxiety disorder, panic disorder.
Cautions: cardiac disease, diabetes mellitus, susceptibility to angle-closure glaucoma, a history of mania or bleeding disorders (especially gastro-intestinal bleeding), and if used with other drugs that increase the risk of bleeding, hepatic impairment, renal impairment, pregnancy, and breast-feeding***:*** should not be given to patients on MAOI's for at least 14 days after discontinuation; Conversely, an MAOI should not be started until at least a week after antidepressant has been stopped.
Contra-indications: if the patient enters a manic phase, the drug should be discontinued and treatment with a neuroleptic should be started.
Side Effects: nausea and reduced salivation, headache and reduced duration of sleep postural hypotension, sinusitis, fatigue; hypersensitivity reactions including rash (consider discontinuation—may be sign of impending serious systemic reaction, possibly associated with vasculitis), urticaria, angioedema, anaphylaxis, arthralgia, myalgia and photosensitivity; galactorrhoea, sexual dysfunction, urinary retention, sweating, hypomania or mania, movement disorders and dyskinesias, visual disturbances, hyponatraemia, and bleeding disorders including ecchymoses and purpura. Suicidal behaviour has been linked with antidepressants.
Dose: initially 10 mg once daily could be increased to max. 20 mg
Max. dose is 20 mg once daily.
Elderly, half the recommended dose i.e. 10- mg/day.
Manic depressive illness, treatment should continue for at least 4-6 months.

- *Cipralex Tablets 10 & 20 mg*

FLUOXETINE HYDROCHLORIDE

This is a selective serotonin reuptake inhibitor (SSRI).
Indications: depressive illness; compulsive obsession diseases; premenstrual dysphoric disorder; bulimia nervosa.
Cautions: hepatic impairment, renal impairment, epilepsy, pregnancy and breast-feeding; may impair performance of skilled tasks.
Should not be given to patients on MAOI's for at least 14 days after discontinuation; Conversely, MAOI's should not be used until at least 5 weeks after discontinuation of fluoxetine;
Contra-indications: severe renal impairment; poorly-controlled epilepsy.
Side Effects: rash and this entitles discontinuation of treatment; nausea, vomiting, diarrhea, anorexia with weight loss, headache, nervousness, insomnia, anxiety, tremor, dry mouth, dizziness, hypomania, drowsiness, convulsions, fever, sexual dysfunction, sweating; raised serum transaminases, depressed leucocyte counts. vasodilatation, postural hypotension, pharyngitis, dyspnea, chills, taste disturbances, sleep disturbances, euphoria, confusion, yawning, impaired concentration, changes in blood sugar, alopecia, urinary frequency;
Dose: initially, 20 mg in the morning is sufficient. If no clinical improvement is observed after several weeks, doses above 20 mg/day should be administered on twice-daily schedule
Max. daily dose is 60 mg.

- *Prozac Capsules 20 mg*

FLUVOXAMINE MALEATE

This is a selective serotonin reuptake inhibitor (SSRI).
Indications: depression states; obsessive-compulsive disorder.
Cautions: epilepsy; concurrent electroconvulsive therapy; history of mania; cardiac disease, bleeding disorders; hepatic and renal impairment. that concomitant use of fluvoxamine and theophylline or aminophylline should usually be avoided;
Contra-indications: patients in manic phase.

Side Effects: palpitations, tachycardia, postural hypotension; confusion, hallucinations, ataxia, paraesthesia, malaise, taste disturbance, neuroleptic malignant syndrome-like event, abnormal liver function tests, usually symptomatic (discontinue treatment); hypersensitivity reactions.
Dose: depression, initially 50-100 mg daily increased if necessary to max. 300 mg daily
Obsessive-compulsive disorder, initially 50 mg in the evening increased gradually if necessary after some weeks to max. 300 mg daily (over 150 mg in divided doses); usual maintenance dose 100–300 mg daily; If no improvement in obsessive-compulsive disorder within 10 weeks, treatment should be reconsidered.
CHILD over 8 years initially 25 mg daily increased if necessary in steps of 25 mg every 4–7 days to max. 200 mg daily (over 50 mg in divided doses)

- *Faverin Tablets 50 mg*

PAROXETINE

This is a selective serotonin reuptake inhibitor (SSRI).
Indication: Major depression, Obsessive compulsive disorder. Panic disorder, Anxiety disorder, post traumatic stress disorder, generalized anxiety disorder.
Cautions: See as Escitalopram Hydrobromide***:*** also achlorhydria or high gastric pH (reduced absorption of oral suspension). Extrapyramidal reactions (including orofacial dystonias) and withdrawal syndrome are reported more commonly with paroxetine than with other SSRIs
Contra-indications: See as Escitalopram Hydrobromide.
Side-effect: See as Escitalopram Hydrobromide. also yawning; raised cholesterol; less commonly arrhythmias, transient changes in blood pressure, confusion, urinary incontinence; *rarely* panic attacks and paradoxical increased anxiety during initial treatment of panic disorder (reduce dose), depersonalisation, and neuroleptic malignant syndrome-like event; very rarely peripheral oedema, acute glaucoma, hepatic disorders (e.g. hepatitis), and priapism
Dose: Anxiety disorder, post traumatic stress disorder, generalized anxiety disorder 25 mg each morning, Max. dose 50 mg daily, Elderly 50 mg.

Obsessive compulsive disorder*:* 25 mg each morning, Max. dose 50 mg.
Panic disorder*:* initially 12.5 mg each morning max. dose 50mg.

- *Seroxat 25mg, 12.5 mg*

OTHER ANTIDEPRESSANT DRUGS

LITHIUM CARBONATE

Indications: prophylaxis in manic-depressive illness & recurrent depression, treatment of mania; aggressive or self-mutilating behavior. Lithium is unsuitable for children.
Special precautions: Lithium salts have a narrow therapeutic/toxic ratio and should therefore not be prescribed unless facilities for monitoring serum-lithium concentrations are available. Doses are adjusted to achieve serum-lithium concentration of 0.4–1 mmol/litre (lower end of the range for maintenance therapy and in elderly patients) on samples taken 12 hours after the preceding dose. It is important to determine the optimum range for each individual patient.
Overdosage: usually with serum-lithium concentration of over 1.5 mmol/litre, may be fatal and toxic effects include tremor, ataxia, dysarthria, nystagmus, renal impairment, and convulsions. If these potentially hazardous signs occur, treatment should be stopped, serum-lithium concentrations redetermined, and steps taken to reverse lithium toxicity. In mild cases withdrawal of lithium and administration of generous amounts of sodium salts and fluid will reverse the toxicity. Serum-lithium concentration in excess of 2 mmol/litre require urgent treatment as Emergency Treatment of Poisoning. hyperreflexia and hyperextension of limbs, convulsions, toxic psychoses, syncope, renal failure, circulatory failure, coma, and occasionally, death;
Cautions: measure serum-lithium concentration regularly (every 3 months on stabilised regimens), measure renal function and thyroid function every 6–12 months on stabilised regimens and advise patient to seek attention if symptoms of hypothyroidism develop (women at greater risk) e.g. lethargy, feeling cold; maintain adequate

sodium and fluid intake; test renal function before initiating and if evidence of toxicity, avoid in renal impairment, cardiac disease, and conditions with sodium imbalance such as Addison's disease; reduce dose or discontinue in diarrhoea, vomiting and intercurrent infection (especially if sweating profusely); psoriasis (risk of exacerbation); pregnancy, breast-feeding, elderly (reduce dose), diuretic treatment, myasthenia gravis; surgery; avoid abrupt withdrawal.

Note: Patients should maintain adequate fluid intake and avoid dietary changes which reduce or increase sodium intake.

Withdrawal of treatment: While there is no clear evidence of withdrawal or rebound psychosis, abrupt discontinuation of lithium increases the risk of relapse. If lithium is to be discontinued, the dose should be reduced gradually over a period of a few weeks and patients should be warned of possible relapse if it is discontinued abruptly

Interactions: Irreversible toxic encephalopathy may occur when lithium is given concurrently with high doses of haloperidol, fluphenazine, or flupentixol.

Side Effects: gastro-intestinal disturbances, fine tremor, renal impairment (particularly impaired urinary concentration and polyuria), polydipsia, leucocytosis; weight gain and oedema (may respond to dose reduction); hyperparathyroidism and hypercalcaemia; signs of intoxication are blurred vision, increasing gastro-intestinal disturbances (anorexia, vomiting, diarrhoea), muscle weakness, increased CNS disturbances (mild drowsiness and sluggishness increasing to giddiness with ataxia, coarse tremor, lack of co-ordination, dysarthria), and require withdrawal of treatment; goitre, raised antidiuretic hormone concentration, hypothyroidism, hypokalaemia, ECG changes, and kidney changes may also occur.

Dose: treatment, Initially 1.5-2 g daily, adjusted to reach plasma concentration of 0.4-1.0 m mole of Li/liter by tests on samples taken hours after the preceding dose on the fourth to seventh day of treatment, then weekly until dosage has remained constant for 4 weeks and every 3 months thereafter.

Prophylaxis, initially, 0.5-1.2 g daily.

Daily doses are usually divided and sustained release preparations normally given twice daily.

- *Priadel Tablets 400 mg*
- *Lithium Carbonate Tablets 450 mg*

MIRTAZAPINE

This is a presynaptic alpha$_2$-adrenoreceptor antagonist, increases central noradrenergic and serotonergic neurotransmission. It has few antimuscarinic effects, but causes sedation during initial treatment.

Indications: Major depression

Cautions & Contra-indications: cardiac disorders, hypotension, history of urinary retention, susceptibility to angle-closure glaucoma, diabetes mellitus, psychoses (may aggravate psychotic symptoms), history of seizures or bipolar depression; hepatic impairment; renal impairment; pregnancy; breast-feeding; Patients should be advised to report any fever, sore throat, stomatitis or other signs of infection during treatment. Blood count should be performed and the drug stopped immediately if blood dyscrasia suspected.

Side Effect: Increased appetite and weight gain, oedema, dizzeness, headache, abnormal dreams, mania, suicidal behavior, seizures, tremor, myoclonus, paraesthesia, arthralgia, myalgia, akathisia, rash, and blood disorders including reversible agranulocytosis.

Dose: Initialy 15 mg daily at bed time increased within 2 – 4 weeks according to response.Max.45 mg daily as single dose at bed time or in 2 divided doses.

- *Remerone 30 mg*

DRUGS USED IN NAUSEA AND VERTIGO

BETAHISTINE HYDROCHLORIDE

Indications: vertigo and hearing disturbances in labyrinthine disorders.

Cautions: asthma, peptic ulcer; pregnancy and breast-feeding. effect of betahistine theoretically antagonised by antihistamines

Contra-indications: phaeochromocytoma

Side Effect: gastro-intestinal disturbances; headache, rashes and pruritus.

Dose: 8-16 mg 3 times daily, preferably with meals, increased as necessary to a max. of 48 mg daily.

- *Betaserc Tablets 8 mg*

CHLORPROMAZINE HYDROCHLORIDE

Indications: severe nausea and vomiting of terminal illness (where other drugs have failed or are not available).
Dose: by mouth, 10-25 mg every 4-6 hours;
Deep IM injection, 25 mg initially then 25-50 mg every 3-4 hours until vomiting stops.
Note: For details refer under drugs used in psychoses.

- *Largactil Tablets 100 mg.*
- *Largactil Injection 50 mg/2 ml*

DOMPERIDONE

Domperidone acts at the chemoreceptor trigger zone.. It has the advantage over metoclopramide and the phenothiazines of being less likely to cause central effects such as sedation and dystonic reactions because it does not readily cross the blood-brain barrier. In Parkinson's disease, it is used to prevent nausea and vomiting during treatment with Domperidone is also used to treat.
Indications: Acute nausea and vomiting especially when associated with cytotoxic therapy, apomorphine and other dopaminergic drugs, emergency hormonal contraception; dyspepsia, gastro-oesophageal reflux.
Cautions: children; renal impairment; breast-feeding; chronic use.
Contra-indications: routine prophylaxis in post-operative vomiting; prolactinoma, hepatic impairment; where increased gastro-intestinal motility harmful; pregnancy
Side-effects*;* increased prolactin concentrations; reduced libido; rash; acute dystonic reactions.
Dose: by mouth, acute nausea and vomiting, 10-20mg every 4-8 hours.
Max. period of treatment, 12 weeks.
Child, nausea and vomiting induced by chemo-or radiotherapy only, 200-400 mcg/kg every 4-8 hours.
Functional dypepysia, 10-20 mg 3 times daily before food and 10-20 mg at night.

Max. period of treatment, 12 weeks.
Child, body-weight under 15 kg, not recommended

- *Motilium Suspension 5 mg/ 5 ml*

METOCLOPRAMIDE HYDROCHLORIDE

Indications: nausea and vomiting particularly in gastro intestinal disorders, during treatment with cytotoxic drugs or radiotherapy, and post-operative conditions; migraine. Use in patients below 20 years of age is restricted to severe intractable vomiting of unknown cause; aid to gastrointestinal intubation; pre-medication.
Cautions: renal impairment, elderly, young adults and children (measure dose accurately); may mask underlying cause such as cerebral irritation; porphyria.
Contra-indications: gastro-intestinal obstruction, perforation or haemorrhage; 3–4 days after gastro-intestinal surgery; phaeochromocytoma; breast-feeding.
Side Effects: extrapyramidal effects (especially in children and young adults), hyperprolactinaemia, occasionally tardive dyskinesia on prolonged administration; drowsiness, restlessness, diarrhoea, depression, neuroleptic malignant syndrome, rashes, pruritus, oedema; cardiac conduction abnormalities reported following intravenous administration; rarely methaemoglobinaemia (more severe in G6PD deficiency)
Dose: by mouth, IM and IV injection, up to 10 mg (5 mg up to the age of 20 years^ 3 times dany. Child, up to 1 year, 1 mg twice daily; 1-3 years, 1 mg 2-3 times daily; 3-5 years, 2 mg 2-3 times daily; 5-9 years, 2.5mg 3 times daily; 9-14 years, 5 mg 3 times daily.
A daily dose of 500 mcg/kg should not be exceeded particularly for patients under 20 years.
IV Infusion, nausea and vomiting associated with cytotoxic drugs, up to 2 mg/kg every 2 hours up to a max. of 10 mg/kg/24 hours.
The initial dose should be given before starting cytotoxic treatment. For radiological examinations, as a single dose by IM or IV injection 5-10 minutes before examination, 10-20 mg (10 mg for ages 15-19 years) Child under 3 years, 1 mg 3-5 years, 2 mg 5-9 years, 2.5 mg 9-14 years, 5 mg By continuous IV infusion (preferred route), initially before starting the chemotherapy, 2-4 mg/kg over

15-30 minutes, then 3-5 mg /kg over 8-12 hours; max. in 24 hours, 10 mg/kg.
By intermittent IV infusion, initially before starting the chemotherapy, up to 2 mg/kg over at least 15 minutes then up to 2 mg/kg over at least 15 minutes every 2 hours; max, in 24 hours, 10 mg/kg.

- *Premosan Tablets 10 mg*
- *Primperan Injection 5 mg/ml*

ONDANSETRON

This is a highly selective 5-HT_3 receptor antagonist.
Indications: management of nausea and vomiting induced by cytotoxic chemotherapy and radiotherapy; Prophylaxis and treatment of post-operative nausea & vomiting.
Cautions: pregnancy; breast-feeding; moderate or severe hepatic impairment.
Contra-indications: hypersensitivity reactions.
Side Effects: constipation; headache; flushing and warmth in the head and epigastrium.
Dose: dose is flexible in the range of 8-32 mg a day.
Adult, moderately emetogenic chemotherapy or radiotherapy, 8 mg by slow injection immediately before treatment or orally 1-2 hours before treatment followed by 8 mg orally twelve-hourly. To protect against delayed emesis after the first 24 hours, treatment should be continued orally, 8 mg twice daily for up to 5 days after a course of treatment.
Highly emetogenic chemotherapy, a single dose of 8 mg by slow injection immediately before chemotherapy, followed by 2 further IV doses of 8 mg 2-4 hours apart or by a constant IV infusion of 1 mg/hour for up to 24 hours. In highly emetogenic chemotherapy, the efficacy may be enhanced by the addition of a single IV dose of dexamethasone 20 mg given before chemotherapy.
Child, single IV dose of 5 mg/m immediately before chemotherapy, then 4 mg orally twice daily for 5 days.
Prevention of postoperative nausea & vomiting***:*** 16 mg 1 hr. before or 8 mg1 hr. before anesthesia followed by 8 mg at intervals of 8 hrs. for further 2 doses. Alternately, IM or slow IV injection, 4 mg at induction of anesthesia
Treatment of postoperative nausea & vomiting***:*** IM or slow IV injection, 4 mg

- *Zofran Injection 4 mg/2ml & 8 mg/4ml*
- *Zofran Tablets 8 mg*

PROCHLORPERAZINE

Indications: severe nausea and vomiting, vertigo, labyrinthine disorders; cytotoxic therapy.
Contra-indications: avoid in children weighing less than 10 kg; elderly.
Dose: by mouth, nausea and vomiting, acute attack, 20 mg initially then 10 mg after 2 hours;
Prevention, 5-10 mg 2-3 times daily;
Child (over 10 kg), 250 mcg/kg 2-3 times daily;
Labryinthine disorders, 5 mg 3 times daily, gradually increased if necessary to 30 mg daily in divided doses, then reduced after several weeks to 5-10 daily;
Deep IM injection, 12.5 mg when required followed if necessary after 6 hours by an oral dose.

- *Stemetil Tablets 5 mg*
- *Stemetil Injection 12.5 mg/ml*

PROMETHAZINE HYDROCHLORIDE

Indications: nausea, vomiting, vertigo, labyrinthine disorders, motion sickness.
Contra-indications: porphyria.
Dose: by mouth, 25-50 mg daily as a single dose or in divided doses; max. 75 mg.
Child, motion sickness prevention, 2-5 years, 5 mg at night before traveling and following morning. 5-10 years, 10 mg at night and following morning.

- *Phenergan Tablet 25 mg*

TRIFLUOPERAZINE

Indications: severe nausea and vomiting.
Side Effects: occur infrequently with anti-emetic doses.
Dose: by mouth, 2-4 mg daily in divided doses or a single dose of a sustained release preparation; max. 6 mg daily.
Child 3-5 years, up to 1 mg daily,
6-12 years, up to 4 mg daily.

- *Stelazine Tablets 1, 2, 5 mg*

ANALGESICS

NON-NARCOTIC ANALGESICS

ACETYLSALICYLIC ACID

Indications: mild to moderate, pain, pyrexia; antiplatelet.
Cautions: gastro-intestinal ulcers, haemophilia, anticoagulant therapy, asthma, impaired renal or hepatic function, dehydration, pregnancy; elderly; G6PD-deficiency.
Contra-indications: children and adolescents under 16 years and in breast-feeding ***(***Reye's syndrome); previous or active peptic ulceration, haemophilia; not for treatment of gout; history of hypersensitivity to aspirin or any other NSAID.
Interactions: Aspirin interacts significantly with a number of other drugs and its interaction with warfarin is a special hazard,
Side Effects: mild and occasional, high rate of gastro-intestinal irritation with slight asymptomatic blood loss, increased bleeding time, bronchospasm and skin reactions in hypersensitive patients.
Dose: 300-900 mg every 4-6 hours when necessary, max. 4 g daily
Child and adolescent not recommended.

- *Aspirin 81mg Tablets*

IBUPROFEN

Indications: pain and inflammation in rheumatic disease (including juvenile idiopathic arthritis) and other musculoskeletal disorders; mild to moderate pain including dysmenorrhoea; postoperative analgesia; migraine; dental pain; fever and pain in children; post-immunisation pyrexia.
Cautions: Same as for other NSAIDs; breast-feeding.
Dose: 1.2- 1.8 g daily in 3-4 divided doses, preferably after food;
max. 2.4 g daily.
Maintenance dose, 0.6-1.2 g daily.
Child, 20 mg/kg daily
In Juvenile arthritis, up to 40 mg/kg daily.

- *Brufen Tablets 400 mg*

- *Brufen Suspension 100 mg/5ml*

MEFENAMIC ACID

Indications: mild to moderate pain, pyrexia in children, menorrhagia.
Cautions: exclude pathological conditions before treating menorrhagia; breast-feeding; porphyria
Contra-indications: inflammatory bowel disease
Side Effects: drowsiness; diarrhoea or rashes (withdraw treatment); thrombocytopenia, haemolytic anaemia (positive Coombs' test), and aplastic anaemia reported; convulsions in overdosage.
Dose: 500 mg 3 times daily after food.
Child over 6 months, 25 mg/kg daily in divided doses for not more than 7 days, except in juvenile chronic arthritis (Still's disease).

- *Ponstan Capsule 500 mg*

NAPROXEN SODIUM

Indications: mild to moderate pain and inflammation in rheumatic disease (including juvenile idiopathic arthritis) and other musculoskeletal disorders; dysmenorrhoea; acute gout.
Cautions: Same as for other NSAIDs; breast-feeding.
Dose: 550 mg initially, then 275 mg 6-8 hourly when necessary, preferably after food.
(275 mg sodium salt = 250 mg naproxen but the salt has a more rapid action).

- *Nopain Tablets 250 mg*

PARACETAMOL

Indications: mild to moderate pain; pyrexia.
Cautions: liver damage in prolonged use or overdosage; renal impairment; alcoholism.
Side Effects: rare, but rashes, blood disorders (including thrombocytopenia, leucopenia, neutropenia) reported; hypotension also reported on infusion;
Dose: 0.5-1 g every 4-6 hours, max. 4 daily.
Child, 3 months to 1 year, 60-120 mg.
1-5 years, 120-250 mg.
6-12 years, 250-500 mg.
Doses repeated every 4-6 hours if necessary.

Infants, under 3 months, 5-10 mg/kg (on doctor's advice only).

- *Adol 500 mg Tablets*
- *Adol Syrup 125 mg/5 ml*
- *Adol Suppositories 1250, 250mg.*
- *Fevadol 500mg Tablet*
- *Muscadol Tablets (Paracetamol 450 mg & Orphenadrine Citrate 35 mg/Tab))*
- *Perfalgan (Paracetamol IV Solution 10mg/ml)*

PARACETAMOL OVERDOSE

ACETYLCYSTEINE

Indications: paracetamol overdosage.
Cautions: asthma.
Side Effects: hypersensitivity-like reactions, bronchoconstriction, rashes.
Dose: by intravenous infusion, in glucose intravenous infusion, initially 150 mg/kg in 200 ml over 15 minutes, followed by 50 mg/kg in 500 ml over 4 hours, then 100 mg/kg in 1000 ml over 16 hours.

- *Parvolex Injection 200 mg/ml-10 ml Ampoules*

NARCOTIC ANALGESICS.

MORPHINE SALTS

Indications: severe pain, left ventricular failure, pulmonary oedema.
Cautions: hypotension, hypothyroidism, asthma and decreased respiratory reserve; prostatic hypertrophy; hepatic impairment; renal impairment; convulsive disorders; dependence; pregnancy; breast-feeding
Contra-indications: acute respiratory depression; acute alcoholism; raised intracranial pressure and head injury; avoid injection in phaeochromocytoma (risk of pressor response to histamine release).
Side Effects: nausea and vomiting, constipation, drowsiness, respiratory depression and hypotension and muscle rigidity; other side effects include difficulty with micturition, ureteric or biliary spasm, dry mouth, sweating, headache, facial flushing, vertigo, bradycardia, tachycardia, palpitation, postural hypotension,

hypothermia, hallucinations, dysphoria, mood changes, dependence, miosis, decreased libido or potency, rashes, urticaria and pruritus

Dose:

Note: The patient should be closely monitored for pain relief as well as for side effects especially respiratory depression

acute pain, by SC or IM injection 10 mg every 4 hours if necessary (15 mg for heavier patients).

Child up to 1 month, 150 mcg/kg; 1-12 months, 200 mcg/kg; 1-5 years, 2.5-5 mg, 6-12 years, 5-10 mg. doses can be repeated every 4 hours, or more in terminal pain.

By slow IV injection, 1/4-1/2 corresponding IM dose.

Acute pulmonary oedema, by slow IV injection (2mg/minute), 10 mg. Followed by a further 5-10 mg if necessary.

Chronic pain, by mouth or by SC or IM injection, 5-20 mg regularly every 4 hours. dose may be increased as necessary; Oral dose = double IM dose.

Myocardial infarction, by slow IV injection (2 mg/minutes), 10 mg followed by a further 5-10 mg if necessary; elderly or frail patients, reduce dose by half.

By mouth, initially 10-20 mg twice daily, adjusted according to response

- *Morphine Injection 10 mg*
- *MST Continus Tablets 30 mg*

PETHIDINE HYDROCHLORIDE

Indications: moderate to severe pain; obstetric analgesia; perioperative analgesia.

Cautions: As for morphine salts; not suitable for severe continuing pain.

Contra-indications: As for morphine salts; severe renal impairment.

Side Effects: As for morphine salts***;*** occasional convulsions.

Dose: Acute pain, by SC or IM injection, 25-100 mg, repeated after 4 hours,

Child, by IM injection, 0.5-2.0 mg/kg. By slow IV injection, 25-50 mg, repeated after 4 hours. Obstetric analgesia, by SC or IM injection, 50-100 mg, repeated 1-3 hours later if necessary; max. 400 mg in 24 hours.

- *Pethidine Injection 50 mg/ml, 100 mg/2ml*

Note: In the postoperative period, the patient should be closely monitored for pain relief as well as for side effects especially respiratory depression

NICOTINE DEPENDENCE

NICOTINE REPLACEMENT THERAPY

NICOTINE

Indications: can be used in place of cigarettes after abrupt cessation of smoking, or alternatively to reduce the amount of cigarettes used in advance of making a quit attempt. Nicotine replacement therapy can also be used to minimise passive smoking, and to treat cravings and reduce compensatory smoking after enforced abstinence in smoke-free environments

Cautions: Most warnings for nicotine replacement therapy also apply to continued cigarette smoking, but the risk of continued smoking outweighs any risks of using nicotine preparations. Nicotine replacement therapy should be used with caution in haemodynamically unstable patients hospitalised with severe arrhythmias, myocardial infarction, or cerebrovascular accident, and in patients with phaeochromocytoma or uncontrolled hyperthyroidism. Care is also needed in patients with diabetes mellitus—blood-glucose concentration should be monitored closely when initiating treatment.

Specific cautions for individual preparations are usually related to the local effect of nicotine. Oral preparations should be used with caution in patients with oesophagitis, gastritis, or peptic ulcers because swallowed nicotine can aggravate these conditions. The gum may also stick to and damage dentures. Acidic beverages, such as coffee or fruit juice, may decrease the absorption of nicotine through the buccal mucosa and should be avoided for 15 minutes before the use of oral nicotine replacement therapy. Care should be taken with the inhalation cartridges in patients with obstructive lung disease, chronic throat disease, or bronchospastic disease. The nasal spray can cause worsening of bronchial asthma. Patches should not be placed on broken skin and should

be used with caution in patients with skin disorders. hepatic impairment Nicotine replacement therapy should be used with caution in moderate to severe hepatic impairment:.

Renal impairment: Nicotine replacement therapy should be used with caution in severe renal impairment.

Pregnancy: The use of nicotine replacement therapy in pregnancy is preferable to the continuation of smoking, but should be used only if smoking cessation without nicotine replacement fails. Intermittent therapy is preferable to patches but avoid liquorice-flavoured nicotine products. Patches are useful, however, if the patient is experiencing pregnancy-related nausea and vomiting. If patches are used, they should be removed before bed.

Breast-feeding: Nicotine is present in milk; however, the amount to which the infant is exposed is small and less hazardous than second-hand smoke.

Note: Nicotine patches are a prolonged-release formulation and are applied for 16 hours (with the patch removed overnight) or for 24 hours. If patients experience strong cravings for cigarettes on waking, a 24-hour patch may be more suitable. Immediate-release nicotine preparations (gum, lozenges, sublingual tablets, inhalator, nasal spray, and oral spray) are used whenever the urge to smoke occurs or to prevent cravings. The choice of nicotine replacement preparation depends largely on patient preference, and should take into account what preparations, if any, have been tried before. Patients with a high level of nicotine dependence, or who have failed with nicotine replacement therapy previously, may benefit from using a combination of an immediate-release preparation and patches to achieve abstinence. All preparations are licensed for adults and children over 12 years

Side Effects: Some systemic effects occur on initiation of therapy, particularly if the patient is using high strength preparations; however, the patient may confuse side effects of the nicotine-replacement preparation with nicotine withdrawal symptoms. Common symptoms of nicotine withdrawal include malaise, headache, dizziness, sleep disturbance, coughing, influenza like symptoms, depression, irritability, increased appetite, weight gain,

restlessness, anxiety, drowsiness, aphthous ulcers, decreased heart rate, and impaired concentration. Mild local reactions at the beginning of treatment are common because of the irritant effect of nicotine. Oral preparations and inhalation cartridges can cause irritation of the throat, gum, lozenges, and oral spray can cause increased salivation, and patches can cause minor skin irritation. The nasal spray commonly causes coughing, nasal irritation, epistaxis, sneezing, and watery eyes; the oral spray can cause watery eyes and blurred vision. Gastrointestinal disturbances are common and may be caused by swallowed nicotine. Nausea, vomiting, dyspepsia, and hiccup occur most frequently. Ulcerative stomatitis has also been reported. Dry mouth is a common side-effect of lozenges, patches, oral spray, and sublingual tablets. Lozenges cause diarrhoea, constipation, dysphagia, oesophagitis, gastritis, mouth ulcers, bloating, flatulence, and less commonly, taste disturbance, thirst, gingival bleeding, and halitosis. Palpitations may occur with nicotine replacement therapy and rarely patches

Dose: Nicotine medicated chewing gum who smoke fewer than 20 cigarettes each day should use 1 piece of 2-mg strength gum when the urge to smoke occurs or to prevent cravings; individuals who smoke more than 20 cigarettes each day or who require more than 15 pieces of 2-mg strength gum each day should use the 4-mg strength. Patients should not exceed 15 pieces of 4-mg strength gum daily. If attempting smoking cessation, treatment should continue for 3 months before reducing the dose.

Administration Chew the gum until the taste becomes strong, then rest it between the cheek and gum; when the taste starts to fade, repeat this process. One piece of gum lasts for approximately 30 minutes. Nicotine transdermal patches As a general guide for smoking cessation, individuals who smoke more than 10 cigarettes daily should apply a high-strength patch daily for 6–8 weeks, followed by the medium strength patch for 2 weeks, and then the low-strength patch for the final 2 weeks; individuals who smoke fewer than 10 cigarettes daily can usually start with the medium-strength patch for 6–8 weeks, followed by the low-strength patch for 2–4 weeks. A slower titration schedule can be used in patients who

are not ready to quit but want to reduce cigarette consumption before a quit attempt.
If abstinence is not achieved, or if withdrawal symptoms are experienced, the strength of the patch used should be maintained or increased until the patient is stabilised.
Patients using the high-strength patch who experience excessive side effects, that do not resolve within a few days, should change to a medium-strength patch for the remainder of the initial period and then use the low strength patch for 2–4 weeks.
Administration Patches should be applied on waking to dry, non-hairy skin on the hip, trunk, or upper arm and held in position for 10–20 seconds to ensure adhesion; place next patch on a different area and avoid using the same site for several days

- *Nicorette 2 mg, 4mg Chewing gum sugar-free, nicotine*
- *Nicotinel 14mg, 21mg TTS Patches, self-adhesive, nicotine, patch (releasing approx. 14 mg/24 hours, 21 mg/24 hours)*

OPIOID DEPENDENCE

METHADONE HYDROCHLORIDE

Indications: severe pain, but less sedating than morphine and acts for longer periods; cough in terminal disease; adjunct in the treatment of opioid dependence. It is an opioid agonist and can be substituted for them to prevent the withdrawal symptoms.
Cautions: in prolonged use, avoid administration more often than twice daily to avoid the risk of accumulation and opioid overdosage, hypertension; hypothyroidism; asthma especially during attack and decreased respiratory reserve; pregnancy and breastfeeding; prostate hypertrophy; hepatic and renal impairment; convulsive disorder.
Note: patients with the following risk factors for QT interval prolongation are carefully monitored while taking methadone***:*** heart or liver disease, electrolyte abnormalities, or concomitant treatment with drugs that can prolong QT interval; patients requiring more than 100 mg daily should also be monitored.

Contra-indications: acute respiratory depression; acute alcoholism; paralytic ileus, acute abdomen; increased intracranial pressure or head injury; phaeochromocytoma
Side Effects: nausea, vomiting, constipation; drowsiness; respiratory depression and hypotension with high doses; difficulty in urination; dry mouth; hallucinations; mood changes; miosis; facial flushing; dependence; decreased libido.
Dose: analgesia, 2.5-10 mg at intervals of 3-8 hours depending on the pain.
Cough suppression, 1-2 mg every 4-6 hours but reduced to twice daily in prolonged use.
Opioid dependence, 10-20 mg initially increased as necessary by 10 mg daily until symptoms of withdrawal disappear.
Usual maintenance dose, 40-60 mg.
Child, not recommended.

- *Methadone Tablets 5 mg*

TRIGEMINAL NEURALGIA

CARBAMAZEPINE

Indications: trigeminal neuralgia, epilepsy. Has no effect on other types of headaches.
Caution, ContraIndications & Side Effects: see carbamazepine under drugs used in psychoses & related disorders.
Dose: 100 mg once or twice daily at start and then gradually increased until the best effect is obtained.
Usual maintenance dose is 200 mg 3-4 times daily; max. 1.6 g daily in some patients.

- *Tegretol Tablets 200 mg*

PHENYTOIN

Indications: trigeminal neuralgia in some patients, pain in diabetes, neuropathy, epilepsy. It can be combined with carbamazepine in very refractory cases or in those unable to tolerate high doses of carbamazepine.
Caution, ContraIndications & ***Side Effects:*** see under drugs used in epilepsy.

- *Epanutin Capsules 100 mg*

ANTI-EPILEPTICS

CARBAMAZEPINE

Indications: partial and secondary generalised tonic-clonic seizures, some primary generalised seizures; trigeminal neuralgia; prophylaxis of bipolar disorder unresponsive to lithium

Cautions: hepatic impairment or renal impairment; cardiac disease, skin reactions, history of haematological reactions to other drugs; may exacerbate absence and myoclonic seizures; susceptibility to angle-closure glaucoma; pregnancy, breast-feeding; avoid abrupt withdrawal.

Contra-indications: AV conduction abnormalities (unless paced); history of bone marrow depression, porphyria

Side Effects: nausea and vomiting, dizziness, drowsiness, headache, ataxia, confusion and agitation (elderly), visual disturbances (especially diplopia); constipation or diarrhoea, anorexia; mild transient generalised erythematous rash may occur in a large number of patients (withdraw if worsens or is accompanied by other symptoms); leucopenia and other blood disorders (including thrombocytopenia, agranulocytosis and aplastic anaemia); other side effects include cholestatic jaundice, hepatitis and acute renal failure, Stevens-Johnson syndrome, toxic epidermal necrolysis, alopecia, thromboembolism, arthralgia, fever, proteinuria, lymph node enlargement, cardiac conduction disturbances (sometimes arrhythmias), dyskinesias, paraesthesia, depression, impotence (and impaired fertility), gynaecomastia, galactorrhoea, aggression, activation of psychosis; very rarely angle-closure glaucoma; photosensitivity, pulmonary hypersensitivity (with dyspnea and pneumonitis), hyponatraemia, oedema, and disturbances of bone metabolism (with osteomalacia)

Note: Different preparations may vary in bioavailability; to avoid reduced effect or excessive side effects, it may be prudent to avoid changing the formulation

Dose: By mouth, epilepsy, initially, 100–200 mg 1–2 times daily, increased slowly to usual dose of 0.4–1.2 g daily in divided doses; in some cases 1.6–2 g daily may be needed; ELDERLY reduce initial dose;

CHILD daily in divided doses, up to 1 year 100–200 mg, 1–5 years 200–400 mg, 5–10 years 400–600 mg, 10–15 years 0.4–1 g
Trigeminal neuralgia, initially 100 mg 1–2 times daily (but some patients may require higher initial dose), increased gradually according to response; usual dose 200 mg 3–4 times daily, up to 1.6 g daily in some patients.
Prophylaxis of bipolar disorder unresponsive to lithium, initially 400 mg daily in divided doses increased until symptoms controlled; usual range 400–600 mg daily; max. 1.6 g daily
Note: Plasma concentration for optimum response 4–12 mg/litre (20–50 micromol/litre)

- *Tegretol Tablets 200 mg*
- *Tegretol-CR Tablets 400 mg*
- *Tegretol Oral Liquid 100 mg/5 ml*

CLONAZEPAM

Indications: all forms of epilepsy; status epilepticus; myoclonus
Cautions: may affect the ability to drive or operate machinery and increase the effects of alcohol; breast-feeding; porphyria; avoid sudden withdrawal; myasthenia gravis, porphyria; hepatic or renal impairment; pregnancy; breast feeding.
Facilities for reversing respiratory depression with mechanical ventilation must be at hand.
Contra-indications: respiratory depression; acute pulmonary insufficiency; sleep apnoea syndrome; marked neuromuscular respiratory weakness including unstable myasthenia gravis.
Side Effects: drowsiness, fatigue, dizziness, muscle hypotonia, hypersalivation in infants, paradoxical aggression, irritability and mental changes, visual disturbances on long-term treatment; blood disorders.
Dose: 1 mg, initially, at night for 4 nights, increased over 2-4 weeks to a daily maintenance dose of 4-8 mg at night. Child up to 1 year, 250 mcg increased as above to 0.5-1 mg. 1-5 years, 250 mcg increased to 1-3 mg. 5-12 years, 500 mcg increased to 3-6 mg.

- *Rivotril Tablets 0.5 mg & 2 mg.*
- *Rivotril Oral Drops 2.5 mg/1 ml- 10 ml Bottles.*

DIAZEPAM

Indications: status epilepticus, convulsions due to poisoning.

C*aution, Contra-indications: & Side Effects:* see under drugs used as hypnotics & sedatives.

Dose: Slow IV injection, adults and children, 10-20 mg at a rate of 0.5 ml (2.5 mg) per 30 seconds, repeated if necessary after 30-60 minutes; may be followed by slow infusion to a max. of 3 mg/kg over 24 hours. Child, 200-300 mcg/kg or 1 mg/year of age.

- *Valium Injection 5 mg/ml In 2 ml Ampoules*

ETHOSUXIMIDE

Indications: absence seizures.

Cautions: avoid abrupt withdrawal; hepatic impairment; renal impairment; pregnancy; breast-feeding; avoid in porphyria.

Blood disorders Patients or their carers should be told how to recognise signs of blood disorders, and advised to seek immediate medical attention if symptoms such as fever, sore throat, mouth ulcers, bruising, or bleeding develop.

Side Effects: gastro-intestinal disturbances (including nausea, vomiting, diarrhoea, abdominal pain, anorexia, weight loss); *less frequently* headache, fatigue, drowsiness, dizziness, hiccup, ataxia, mild euphoria, irritability, aggression, impaired concentration; *rarely* tongue swelling, sleep disturbances, night terrors, depression, psychosis, photophobia, dyskinesia, increased libido, vaginal bleeding, myopia, gingival hypertrophy, and rash; also reported, hyperactivity, increase in seizure frequency, blood disorders such as leucopenia, agranulocytosis, pancytopenia, and aplastic anaemia (blood counts required if features of infection), systemic lupus erythematosus, and Stevens-Johnson syndrome.

Dose: initially 500 mg daily increased according to patient's needs by 250 mg at intervals of 4-7 days to usual dose of 1–1.5 g daily up to a max. of 2 g daily.

Child up to 6 years, 250 mg daily.

Over 6 years, 500 mg increased gradually to a max. of lg daily.

- *Zarontin Capsules 250 mg*

- *Zarontin Syrup 250 mg/ 5ml*

LAMOTRIGINE

Indications: epilepsy; monotherapy and adjunctive treatment of partial seizures and tonic clonic seizures not satisfactorily controlled with other antiepileptic drugs.
Cautions: closely monitor and consider withdrawal if rash, fever, or other signs of hypersensitivity syndrome develop; abrupt withdrawal may provoke rebound seizures; impaired renal and hepatic functions; pregnancy and breast-feeding.
Contra-indications: hypersensitivity reactions. symptoms and signs suggestive of bone-marrow failure such as anaemia, bruising, or infection.
Side Effects: skin rashes that may lead to withdrawal of the drug; Stevens-Johnson syndrome; diplopia, blurred vision, nystagmus, dizziness, drowsiness, headache, unsteadiness, tiredness, hallucinations, occasional increase in seizure frequency; gastrointestinal disturbances, and irritability/aggression; blood disorders (including leucopenia, thrombocytopenia, pancytopenia); arthralgia; lupus erythematosus-like effect; photosensitivity.
Dose: the dispersible tablets may be chewed, dispersed in a small volume of water or swallowed whole with a little water.
Monotherapy, ADULT and CHILD over 12 years, initially 25 mg daily for 14 days, increased to 50 mg daily for further 14 days, then increased by max. 50–100 mg daily every 7–14 days; usual maintenance 100–200 mg daily in 1–2 divided doses (up to 500 mg daily has been required) Adjunctive therapy with valproate, initially 25 mg every other day for 14 days then 25 mg daily for further 14 days, thereafter increased by max. 25–50 mg daily every 7–14 days; usual maintenance, 100–200 mg daily in 1–2 divided doses; CHILD 2–12 years initially 150 mcg/kg daily for 14 days (those weighing under 13 kg may receive 2 mg on alternate days for first 14 days) then 300 mcg/kg daily for further 14 days, thereafter increased by max. 300 mcg/kg daily every 7–14 days; usual maintenance 1–5 mg/kg daily in 1–2 divided doses

- *Lamictal Tablets 5mg, 25mg, 50 mg & 100 mg*

LEVETIRACETAM

Indications: adjunctive treatment of partial seizures with or without secondary generalization, adjunctive treatment of myoclonic seizures.
Cautions: Avoid sudden withdrawal, pregnancy, renal and hepatic impairments.
Contra-indications: hypersensitivity to levetiracetam or any component of the formulation, breast-feeding.
Side Effects: nausea, vomiting, dyspepsia, diarrhea, cough, drowsiness, asthenia, amnesia, ataxia, dizziness, headache, tremor, hyperkinesia, depression, insomnia, anxiety, anorexia, diplopia, rash, confusion, irritability, psychosis, suicidal ideation, leucopenia, pancytopenia, thrombocytopenia and alopecia.
Dose: adult and child over 12 years, body – weight over 50 kg, initially 500 mg twice daily, adjusted every 2 to 4 weeks, max.1.5 g twice daily.
Child and adolescent 4-18 years (12- 18 years for myoclonic seizures), body weight under 50 kg initially 10 mg/kg twice daily adjusted every 2 weeks, max.30 mg/kg twice daily.

- *Keppra 500mg & 1000mg Tablets*

PHENOBARBITAL

Indications: all forms of epilepsy except absence seizures; less satisfactory in status epilepticus.
Cautions: avoid sudden withdrawal; children, elderly; impaired renal or hepatic function; severe respiratory depression; pregnancy, breast-feeding; porphyria; CNS depressants, alcohol.
Side Effects: hepatitis, cholestasis; hypotension; respiratory depression; behavioural disturbances, nystagmus, irritability, drowsiness, lethargy, depression, ataxia, paradoxical excitement, hallucinations, impaired memory and cognition, hyperactivity particularly in the elderly and in children; osteomalacia; megaloblastic anaemia (may be treated with folic acid), agranulocytosis, thrombocytopenia; allergic skin reactions; very rarely Stevens-Johnson syndrome and toxic epidermal necrolysis.
Special Precautions: CNS sedatives, particularly alcohol.

Dose: by mouth, 60-180 mg at night; Child, 5-8 mg/kg daily.
By IM injection, 200 mg repeated after 6 hours if necessary. Child, 15 mg/kg.
Status epilepticus, by IV injection (dilute injection 1 in 10 with water for injection), 10 mg/kg at a rate of not more than 100 mg/minute; max. 1 g.
Note: For therapeutic purposes phenobarbital and phenobarbital sodium may be considered equivalent in effect. Plasma-phenobarbital concentration for optimum response 15–40 mg/litre (60–180 micromol/litre)

- *Luminal Tablets 15 mg, 30 mg & 60 mg.*
- *Gardenal Elixir 20 mg & 30 mg/5 ml.*
- *Phenobarbital Injection 200 mg/ml.*

PHENYTOIN SODIUM

Indications: all forms of epilepsy except absence seizures; status epilepticus; prophylaxis of seizures in neurosurgery.
Cautions: avoid abrupt withdrawal; avoid in porphyria; hepatic impairment; pregnancy; breast-feeding***:*** hepatic failure; sudden withdrawal and change to other drugs should be made cautiously.
Side Effects: nausea, vomiting, constipation, insomnia, transient nervousness, tremor, paraesthesia, dizziness, headache, anorexia; gingival hypertrophy and tenderness; rash (discontinue; if mild re-introduce cautiously but discontinue immediately if recurrence), acne, hirsutism, coarse facies; *rarely* hepatoxicity, peripheral neuropathy, dyskinesia, lymphadenopathy, osteomalacia, blood disorders (including megaloblastic anaemia (may be treated with folic acid), leucopenia, thrombocytopenia, and aplastic anaemia), polyarteritis nodosa, lupus erythematosus, Stevens-Johnson syndrome, and toxic epidermal necrolysis; with excessive dosage nystagmus, diplopia, slurred speech, ataxia, confusion, and hyperglycaemia.
Dose: by mouth, daily as a single dose or 2 divided doses, with water, 150-300 mg increased gradually to 600 mg according to the patient's needs (with plasma-phenytoin concentration monitoring).
Usual dose, 200-500 mg daily

Child, 5-8 mg/kg daily in 1 or 2 doses; max. 300 mg daily.
By slow IV injection or infusion, status epilepticus, 13-15 mg/kg at a rate not exceeding 50 mg per minute, as a loading dose; Maintenance doses of about 100 mg should be given thereafter at intervals of every 6 hours.
Note: Plasma concentration for optimum response 10–20 mg/litre (40–80 micromol/litre)
Take preferably with or after food

- *Epanutin Capsules 100 mg*
- *Epanutin Suspension 30 mg/5 ml*
- *Epanutin Injection 250 mg/5 Ampoule*

PRIMIDONE

Indications: all forms of epilepsy except absence seizures; essential tremor.
Cautions: Same as phenobarbital.
Side Effects: Same as phenobarbital. also nausea and visual disturbances; less commonly vomiting, headache, and dizziness; *rarely* arthralgia
Dose: *epilepsy*, ADULT and CHILD over 9 years, initially 125 mg daily at bedtime, increased by 125 mg every 3 days to 500 mg daily in 2 divided doses then increased according to response by 250 mg every 3 days to max. 1.5 g daily in 2 divided doses;
CHILD under 9 years, initially 125 mg daily at bedtime, increased by 125 mg every 3 days according to response; usual maintenance, CHILD under 2 years, 250–500 mg daily in 2 divided doses; 2–5 years, 500–750 mg daily in 2 divided doses; 6–9 years 0.75–1 g daily in 2 divided doses.
Essential tremor, initially 62.5 mg daily increased gradually over 2–3 weeks according to response; max. 750 mg daily.

- *Mysoline Tablets 250 mg*

Note: Monitor plasma concentrations of derived phenobarbital. Optimum range as for phenobarbital.

SODIUM VALPROATE

Indications: all forms of epilepsy.
Cautions: hepatic impairment; liver function must be monitored before and at 2-months intervals during first 6

months of therapy; monitor platelet function before major surgery; systemic lupus erythematosus; false-positive urine tests for ketones; avoid abrupt withdrawal; renal impairment; pregnancy; breast-feeding
Contra-indications: active liver disease, family history of severe hepatic dysfunction; porphyria.
Side Effects: gastric irritation, nausea, hyperammonaemia; increased appetite and weight gain; transient hair loss with curly regrowth, *less frequently* increased alertness, aggression, hyperactivity, behavioural disturbances, ataxia, tremor, and vasculitis; *rarely* hepatic dysfunction (withdraw treatment immediately if persistent vomiting and abdominal pain, anorexia, jaundice, oedema, malaise, drowsiness, or loss of seizure control), lethargy, drowsiness, confusion, stupor, hallucinations, menstrual disturbances, anaemia, leucopenia, pancytopenia, hearing loss, and rash; very rarely pancreatitis, peripheral oedema, increase in bleeding time, extrapyramidal symptoms, dementia, encephalopathy, coma, gynaecomastia, Fanconi's syndrome, hirsutism, acne, enuresis, hyponatraemia, toxic epidermal necrolysis, and Stevens-Johnson syndrome.
Dose: By mouth, initially 600 mg daily in 2 divided doses, preferably after food, increased by 200 mg daily every 3 days to max. 2.5 g daily, usual maintenance dose 1–2 g daily (20–30 mg/kg daily); CHILD body-weight up to 20 kg, initially 20 mg/kg daily in divided doses, may be increased provided plasma concentration monitored (dose above 40 mg/kg daily also monitor clinical chemistry and haematological parameters); CHILD under 12 years body-weight over 20 kg, initially 400 mg daily in divided doses increased according to response (usual range 20–30 mg/kg daily); max. 35 mg/kg daily

- *Depakine Tablets 200 mg; 500 mg & 500mg Chromo*
- *Depakine Syrup 200 mg/5 ml- 150 ml Bottles*
- *Depakine Drops 200 mg/1 ml - 40 ml Bottles*

VIGABATRIN

This is a selective inhibitor of GABA transaminase.
Indications: treatment of refractory epilepsy, particularly partial epilepsy in adults and children, excluding petit

mal, in addition to existing treatment; monotherapy for infantile spasms (West's Syndrome)
Cautions: renal impairment; elderly; closely monitor neurological function; avoid sudden withdrawal (taper off over 2–4 weeks); history of psychosis, depression or behavioural problems; pregnancy***:*** and breast-feeding; absence seizures (may be exacerbated).
Contra-indications: visual field defects
Note: Onset of symptoms varies from 1 month to several years after starting. In most cases, visual field defects have persisted despite discontinuation. Product literature advises visual field testing before treatment and at 6-month intervals; a procedure for testing visual fields in those with a developmental age of less than 9 years is available from the manufacturers. Patients should be warned to report any new visual symptoms that develop and those with symptoms should be referred for an urgent ophthalmological opinion. Gradual withdrawal of vigabatrin should be considered.
Side Effects: drowsiness and fatigue; dizziness, nervousness, irritability, behavioural effects such as excitation and agitation especially in children; depression, abnormal thinking, headache, nystagmus, ataxia, tremor, paraesthesia, impaired concentration; less commonly confusion, aggression, psychosis, mania, memory disturbance, visual disturbance (e.g. diplopia); also weight gain, oedema, gastro-intestinal disturbances, alopecia, rash; less commonly, urticaria, occasional increase in seizure frequency (especially if myoclonic), decrease in liver enzymes, slight decrease in haemoglobin; photophobia and retinal disorders (e.g. peripheral retinal atrophy); optic neuritis, optic atrophy, hallucinations.
Dose: with current antiepileptic therapy, initially 1 g daily in single or 2 divided doses then increased according to response in steps of 500 mg at weekly intervals; usual range 2–3 g daily (max. 3 g daily); CHILD initially 40 mg/kg daily in single or 2 divided doses then adjusted according to body-weight 10–15 kg, 0.5–1 g daily; body-weight 15–30 kg, 1–1.5 g daily; body-weight 30–50 kg, 1.5–3 g daily; body-weight over 50 kg, 2–3 g daily

Infantile spasms (West's syndrome), *monotherapy*, 50 mg/kg daily, adjusted according to response over 7 days; up to 150 mg/kg daily used with good tolerability

- *Sabril Tablets 500 mg*

DRUGS USED IN PARKINSONISM AND RELATED DISORDERS

AMANTADINE HYDROCHLORIDE

Indications: Parkinsonism (but not drug-induced extrapyramidal symptoms); antiviral

Cautions: cardiovascular, hepatic, or renal disease; recurrent eczema; psychosis; elderly patients; breast-feeding. Avoid abrupt discontinuation of treatment.

Contra-indications: epilepsy, gastric ulcer; severe renal impairment; pregnancy, breast-feeding.

Side Effects: anorexia, nausea, nervousness, inability to concentrate, insomnia, dizziness, convulsions, hallucinations or feelings of detachment, blurred vision, gastro-intestinal disturbances, livedo reticularis and peripheral oedema; rarely leucopenia, rashes.

Dose: Parkinson's disease, 100 mg daily increased after one week to 100 mg twice daily, usually in conjunction with other treatment; some patients may require higher doses, max. 400 mg daily;

ELDERLY 65 years and over, 100 mg daily adjusted according to response.

Post-herpetic neuralgia, 100 mg twice daily for 14 days, continued for a further 14 days if necessary

100 mg daily increased if necessary to 100 mg twice daily (not later than 4 p.m.) usually in conjunction with other treatment. Max. 400 mg daily.

- *Symmetrel Capsules 100 mg*

BENZTROPINE MESYLATE

This is an antimuscarinic drug.

Indications: Parkinsonism, drug-induced extra-pyramidal symptoms.

Cautions: same as for Benzhexol Hydrochloride*;* causes sedation rather than stimulation; persons affected should not drive or operate machinery; avoid alcohol (CNS depression).

Contra-indications: gastrointestinal obstruction*;* tardive dyskinesia; avoid in children under 3 years.
Side Effects: same as for Benzhexol Hydrochloride, but causes sedation rather than stimulation; also depression and hyperthermia.
Dose: by mouth, 0.5-1 mg daily usually at bedtime, gradually increased; max. 6 mg daily;
Usual maintenance dose, 1-4 mg daily in single or divided doses;
By IM or IV injection, 1-2 nig repeated if symptoms reappear.

- *Cogentin Tablets 2 mg*
- *Cogentin Injection 1 mg/ml*

BROMOCRIPTINE

Indications: Parkinsonism (but not drug-induced extrapyramidal symptoms); endocrine diseases.
Cautions: Monitor pituitary enlargement, pregnancy, breast feeding, history of psychic or cardiovascular disorders; Raynaud's syndrome, fibrotic reactions, porphyria, hepatic impairment. Initial hypotensive reactions in some patients.
Contra-indications: hypersensitivity to bromocriptine or other ergot alkaloids, toxaemia of pregnancy***:*** or hypertension in postpartum women or in puerperium.
Side Effects: abnormal involuntary movements; confusional states; nausea, constipation, headache, drowsiness.
Dose: by mouth, First week, 1-1.25 mg at night, Second week, 2-2.25 mg at night, Third week, 2.5 mg twice daily, Fourth week, 2.5 mg 3 times daily, increasing by 2.5 mg every 3-14 days according to response to a usual range of 10-40 mg daily in 3 divided doses, taken with food.

- *Parlodel Tablets 2.5 mg*

LEVODOPA WITH BENSERAZIDE (Co-beneldopa)

A mixture of benserazide hydrochloride and levodopa in mass proportions corresponding to 1 part of benserazide and 4 parts of levodopa
Indications: treatment of all stages of Parkinson's disease (but not drug-induced extrapyramidal symptoms).

Cautions: pulmonary disease, peptic ulceration, cardiovascular disease, diabetes mellitus, osteomalacia, open-angle glaucoma, susceptibility to angle-closure glaucoma, history of skin melanoma (risk of activation), psychiatric illness (avoid if severe); excessive drowsiness; in prolonged therapy, psychiatric, hepatic, haematological, renal, and cardiovascular surveillance is advisable; warn patients to resume normal activities gradually; avoid abrupt withdrawal of levodopa preparations.
Contra-indications: narrow-angle glaucoma; severe psychoneuroses or psychoses; concomitant MAO I therapy; pregnancy; breast-feeding.
Side Effects: anorexia, nausea and vomiting, insomnia, agitation, postural hypotension (rarely labile hypertension), dizziness, tachycardia, arrhythmias, reddish discoloration of urine and other body fluids, rarely hypersensitivity; abnormal involuntary movements and psychiatric symptoms which include hypomania and psychosis may be dose-limiting; depression, drowsiness, headache, flushing, sweating, gastro-intestinal bleeding, peripheral neuropathy, taste disturbance, pathological gambling, increased libido, hypersexuality, pruritus, rash, and liver enzyme changes also reported; syndrome resembling neuroleptic malignant syndrome reported on withdrawal; very rarely angle-closure glaucoma
Dose: expressed as levodopa, initially, 50 mg 3-4 times daily increased by 100 mg once or twice weekly according to response. Usual maintenance dose 400-800 mg daily in divided doses after meals.

- *Madopar Capsules 250 mg (200 mg L-Dopa & 50 mg Benserazide)*

LEVODOPA WITH CARBIDOPA (Co-careldopa)

Indications: parkinsonisim but not drug-induced extrapyramidal effects.
Cautions: pulmonary disease, peptic ulcer, cardiovascular disease, diabetes mellitus, skin melanoma, open-angle glaucoma, asthma, renal and hepatic impairment.
Contra-indications: concomitant MAOI therapy; narrow angle glaucoma.

Side Effects: dyskinesia, muscle twitching and blepharospasm; mental changes.
Dose: expressed as levodopa, initially, 100 mg 3 times increased by 50-100 mg daily or on alternate days according to response up to 800 mg daily in divided doses

- *Sinemet Tablets (L-Dopa 250 mg & Carbidopa 25 mg)*
- *Sinemet-Plus Tablets (L-Dopa 100 mg & Carbidopa 25 mg)*

ORPHENADRINE HYDROCHLORIDE

This is an antimuscarinic drug.
Indications: Parkinsonism, particularly with apathy and depression; drug-induced extrapyramidal symptoms (but not tardive dyskinesia)
Cautions: same as for Benzhexol Hydrochloride.
Contra-indications: gastrointestinal obstruction*;* tardive dyskinesia; also porphyria
Side Effects: same as for Benzhexol Hydrochloride, less commonly insomnia and impaired coordination.
Dose: initially 150 mg daily in divided doses, increased gradually in steps of 50 mg every 2–3 days according to response; usual dose range 150–300 mg daily in divided doses; max. 400 mg daily;
ELDERLY preferably lower end of range

- *Disipal Tablets 50 mg*

PRAMIPEXOLE

It is dopamine agonists.
Indications: used alone or with other medications to treat the symptoms of Parkinson's, it is also used to treat restless legs syndrome (RLS; a condition that causes discomfort in the legs and a strong urge to move the legs, especially at night and when sitting or lying down).
Cautions: avoid abrupt withdrawal (risk of neuroleptic malignant syndrome), renal impairment, pregnancy, severe cardiovascular disease, psychotic disorders, ophthalmological testing recommended (risk of visual disorders).
Contra- Indications: hypersensitivity to pramipexole or any component of the formulation, breast- feeding.

Side Effects: nausea, abnormal body movements and motions, weakness dizziness drowsiness, difficulty falling asleep or staying asleep, difficulty remembering, confusion, abnormal thoughts, heartburn, constipation, diarrhoea, loss of appetite, weight loss, dry mouth, joint pain, frequent urination or urgent need to urinate, difficulty urinating or pain when urinating, decreased sexual interest or ability, oedema, hallucinations, changes in vision, chest pain, shortness of breath, dark, red, colored urine, muscle tenderness, muscle weakness, postural hypotension.
Dose: Parkinson's disease, initially 0.88 mg 3 times daily, dose doubled every 5-7 days if tolerated to 0.350 mg 3 times daily, further increased if necessary by 0.18 mg 3 times daily at weekly intervals. Max. 3.3 mg daily in 3 divided doses.
When it is used to treat restless legs syndrome, initially 0.88 mg once daily 2-3 hours before bedtime, dose doubled every 4-7 days if necessary to 0.350 mg daily, max. 0.540 mg daily, children and adolescent under 18 years not recommended.
The doses in renal impairment need to be adjusted.

- *Sifrol 0.88 mg Tablets*

PROCYCLIDINE HYDROCHLORIDE

This is an antimuscarinic drug.
Indications: Parkinsonism, drug-induced extrapyramidal symptoms (but not tardive dyskinesia)
Cautions: same as for Benzhexol Hydrochloride.
Contra-indications: gastrointestinal obstruction; tardive dyskinesia.
Side Effects: same as for Benzhexol Hydrochloride, but causes sedation rather than stimulation; also gingivitis.
Dose: By mouth, 2.5 mg 3 times daily, increased gradually in steps of 2.5–5 mg daily every 2–3 days if necessary; usual max. 30 mg daily in 2–4 divided doses (60 mg daily in exceptional circumstances); ELDERLY preferably lower end of range

- *Kemadrin Tablets 5 mg*

SELEGILINE HYDROCHLORIDE

Indications: Parkinson's disease, used alone or as adjunct to levodopa with dopa-decarboxylase inhibitor (but not drug-induced extrapyramidal effects).
Cautions: avoid abrupt withdrawal; gastric and duodenal ulceration (avoid in active ulceration), uncontrolled hypertension, arrhythmias, angina, psychosis, side effects*:* of levodopa may be increased, concurrent levodopa dosage can be reduced by 10–20%.
Contra-indications: pregnancy; breast-feeding.
Side Effects: nausea, constipation, diarrhoea, dry mouth; postural hypotension; dyskinesia, vertigo, sleeping disorders, confusion, hallucinations; arthralgia, myalgia; mouth ulcers with oral lyophilisate; *rarely* arrhythmias, agitation, headache, micturition difficulties, skin reactions; also chest pain.
Dose: 10 mg in the morning or 5 mg at breakfast and midday.
To avoid initial confusion and agitation, it may be appropriate to start treatment with a dose of 2.5 mg daily, particularly in the elderly.

- *Eldepryl Tablets 5 mg*

TRIHEXYPHENIDYL HYDROCHLORIDE

(Benzhexol Hydrochloride)
This is an antimuscarinic drug.
Indications: Parkinsonism, particularly with apathy and depression; drug-induced extrapyramidal effects (but not tardive dyskinesia).
Cautions: cardiovascular, renal and hepatic impairment; psychotic disorders; prostatic hypertrophy; elderly; may cause abuse; avoid abrupt withdrawal.
Contra-indications: gastrointestinal obstruction*;* tardive dyskinesia.
Side Effects: Constipation, dry mouth, nausea, vomiting, tachycardia, dizziness, confusion, euphoria, hallucinations, impaired memory, anxiety, restlessness, urinary retention, blurred vision and rash.
Dose: 1 mg daily gradually increased; Usual maintenance dose, 5-15 mg daily in 3-4 divided doses.

- *Artane Tablets 2 mg & 5 mg*

DRUGS USED IN CHOREAS, TICS AND RELATED DISORDERS

HALOPERIDOL

Indications: motor tics, stuttering, and symptoms of Gilles de la Tourette syndrome and related Choreas; as an antipsychotic.
Cautions, Contra-indications: & Side Effects: See under antipsychotic drugs.
Dose: by mouth, 0.5-1.5 mg 3 times daily adjusted according to response; 10 mg daily or more may occasionally be necessary in Gille de la Tourette syndrome.
Child, stuttering, 50 mcg/kg daily; Gilles de la Tourette syndrome, up to 10 mg daily.

- *Serenace Tablets 1.5 mg, 5 mg & 10 mg*
- *Haldol Drops 2 mg/ml*

PIRACETAM

Indications: adjunctive treatment of cortical myoclonus; It is said to protect the cerebral cortex against hypoxia; trauma of surgery; alcoholism; vertigo, senile dementia, cerebrovascular accidents and behavioral disorders in children.
Cautions: avoid abrupt withdrawal; elderly; haemostasis, major surgery, or severe haemorrhage; renal impairment.
Contra-indications: cerebral haemorrhage; hepatic and severe renal impairment; pregnancy and breast-feeding.
Side Effects: weight gain, nervousness, hyperkinesia; less commonly drowsiness, depression, asthenia, also reported abdominal pain, nausea, vomiting, diarrhoea, headache, anxiety, confusion, hallucination, vertigo, ataxia, insomnia, and rash.
Dose: initially 7.2 g daily in 2–3 divided doses, increased according to response by 4.8 g daily every 3–4 days to max. 20 g daily (subsequently, attempts should be made to reduce dose of concurrent therapy); CHILD under 16 years not recommended

- *Nootropil 800mg Tablet*
- *Nootropil Infusion 400 mg*
- *Nootropil Oral Solution 20 % (1 ml = 330 mg)*

PROPRANOLOL

Indications: treatment of essential tremors or tremors associated with anxiety or thyrotoxicosis.
Dose: by mouth, 40 mg 2-3 times daily increased if necessary; 80-160 mg daily is usually required for maintenance.

- *Inderal Tablets 10 mg & 40 mg*

NADOLOL

Indications: Hypertension, Arrhythmias, Angina, Migraine prophylaxis, Thyrotoxicosis
Cautions: avoid abrupt withdrawal especially in ischaemic heart disease; first-degree AV block; portal hypertension (risk of deterioration in liver function); diabetes; history of obstructive airways disease (introduce cautiously and monitor lung function—and thyrotoxicosis may be masked; psoriasis; history of hypersensitivity—may increase sensitivity to allergens and result in more serious hypersensitivity response, also may reduce response to adrenaline (epinephrine)
Contra-indications: asthma, uncontrolled heart failure, Prinzmetal's angina, marked bradycardia, hypotension, sick sinus syndrome, second- or third- degree AV block, cardiogenic shock, metabolic acidosis, severe peripheral arterial disease; phaeochromocytoma (apart from specific use with alpha-blockers
Hepatic impairment: reduce oral dose
Renal impairment: manufacturer advises caution—dose reduction may be required
Side Effects: also gastro-intestinal disturbances; bradycardia, heart failure, hypotension, conduction disorders, peripheral vasoconstriction (including exacerbation of intermittent claudication and Raynaud's phenomenon); bronchospasm (see above), dyspnea; headache, fatigue, sleep disturbances, paraesthesia, dizziness, vertigo, psychoses; sexual dysfunction; purpura, thrombocytopenia; visual disturbances; exacerbation of psoriasis, alopecia; *rarely* rashes and dry eyes (reversible on withdrawal) see under Propranolol Hydrochloride
Dose: Hypertension, initially 80 mg once daily, increased in increments of up to 80 mg at weekly

intervals if required; max. 240 mg daily (higher doses rarely necessary) Angina, initially 40 mg once daily, increased at weekly intervals if required; usual max. 160 mg daily (rarely up to 240 mg may be required) Arrhythmias, initially 40 mg once daily, increased at weekly intervals up to 160 mg if required; reduce to 40 mg if bradycardia occurs Migraine prophylaxis, initially 40 mg once daily, increased in 40 mg increments at weekly intervals according to response; usual maintenance dose 80–160 mg once daily Thyrotoxicosis (adjunct), 80–160 mg once daily

- *Corgard Tablets 80 mg*

PRIMIDONE

Indications: benign essential tremor.
Dose: by mouth, 125 mg 3 times daily.

- *Mysoline Tablets 250 mg*

OTHERS

MAGNESIUM SULFATE

Indications: reduction of elevated intracranial pressure; central nervous system depressant; convulsive states; hypomagnesaemia.
Dose: by IM injection, 1-5 g as a 25 or 50% solution, repeated up to 6 times daily, if necessary.
By IV injection or infusion, 1-4 g as a 10 or 20% solution at a rate not exceeding 150 mg per minute.

- *Magnesium Sulfate Injection 50%*

CNS STIMULANTS AND DRUGS USED FOR ATTENTION DEFICIT HYPERACTIVITY DISORDER

METHYLPHENIDATE HYDROCHLORIDE

This is a CNS stimulant
Indications: narcolepsy, excessive drug sedation, hyperkinetic behavior in children (attention deficit hyperactivity disorder); cerebral arteriosclerosis.
Cautions: epilepsy, hypertension, tolerance or dependence can occur, avoid long-term use, pregnancy.

Contra-indications: cardiovascular disease, hyperthyroidism, glaucoma, severe depression, psychosis; anxiety, hyper excitability or restlessness; tics or a family history of Tourette syndrome; drug or alcohol dependence; hyperthyroidism; breast-feeding.
Side Effects: abdominal pain, nausea, vomiting, dyspepsia, dry mouth, anorexia, reduced weight gain; tachycardia, palpitation, arrhythmias, changes in blood pressure; tics (very rarely Tourette Syndrome), insomnia, nervousness, asthenia, depression, irritability, aggression, headache, drowsiness, dizziness, movement disorders; fever; arthralgia; rash, pruritus, alopecia; less commonly diarrhoea, abnormal dreams, confusion, suicidal ideation, urinary frequency, haematuria, muscle cramps, epistaxis; *rarely* angina, growth restriction, visual disturbances; very rarely hepatic dysfuntion, myocardial infarction, cerebral arteritis, psychosis, neuroleptic malignant syndrome, tolerance and dependence, blood disorders including leucopenia and thrombocytopenia, angle-closure glaucoma, exfoliative dermatitis, erythema multiforme.
Dose: 10 mg 2-3 times daily before food (last dose not later than 4 p.m.)
Child above 6 years, 5 mg twice daily increasing if necessary by weekly increments of 5-10 mg max. 60 mg daily in divided doses.
Not recommended for children under 6 years.

- *Concerta XL Tablets 18mg, 36mg*
- *Methylphenidate Tablets 10mg*

DRUGS FOR DEMENTIA AND ALZHEIMER DISEASE

GALANTAMINE

Indications: mild to moderate dementia in Alzheimer's disease
Cautions: cardiac disease (including sick sinus syndrome or other supraventricular conduction abnormalities, unstable angina, congestive heart failure); electrolyte disturbances; susceptibility to peptic ulcers; asthma, chronic obstructive pulmonary disease, pulmonary infection; avoid in urinary retention, gastro-intestinal

obstruction, and while recovering from bladder or gastro-intestinal surgery; history of seizures.
Hepatic impairment: for immediate-release preparations in moderate impairment, initially 4 mg once daily (preferably in the morning) for at least 7 days, then 4 mg twice daily for at least 4 weeks; max. 8 mg twice daily; avoid in severe impairment. for modified-release preparations in moderate impairment, initially 8 mg on alternate days (preferably in the morning) for 7 days, then 8 mg once daily for 4 weeks; max. 16 mg daily; avoid in severe impairment
Renal impairment: avoid if eGFR less than 9 ml/minute/1.73m^2,
Pregnancy: use with caution
Side Effects: vomiting, nausea, abdominal pain, diarrhoea, dyspepsia, anorexia, weight loss, bradycardia, hypertension, syncope, hallucination, depression, dizziness, tremor, headache, drowsiness, malaise, muscle spasm, sweating; less commonly taste disturbance, palpitation, arrhythmias, first-degree AV block, hypotension, flushing, paraesthesia, dehydration, seizures, muscular weakness, blurred vision, tinnitus; *rarely* hepatitis, exacerbation of Parkinson's disease.
Dose: Initially 4 mg twice daily for 4 weeks increased to 8 mg twice daily for 4 weeks.
Maintenance***:*** 8-12 mg twice daily

- *Reminyl Tablets 8m g, 16 mg*

MEMANTINE

Indications: moderate to severe dementia in Alzheimer's disease
Cautions: history of convulsions renal impairment, pregnancy
Contra-indications: Breast feeding
Side Effects: constipation; hypertension; dyspnea; headache, dizziness, drowsiness; less commonly vomiting, thrombosis, heart failure, confusion, fatigue, hallucinations, and abnormal gait; very rarely seizures; pancreatitis, psychosis, depression, and suicidal ideation also reported.
Dose: Initially 5 mg once daily, increased in steps of 5 mg at weekly intervals to max. 20 mg daily

- *Ebixa Tablet 10 mg*

5 - INFECTIONS

ANTIBACTERIAL DRUGS

AMIKACIN SULPHATE

Indications: serious gram-negative infections resistant to gentamicin.
Cautions: pregnancy, renal impairment**,** neonates and infants.
Contra-indications: myasthenia gravis
Side Effects: vestibular and auditory damage; nephrotoxicity; colitis; nausea, vomiting and rash.
Pharmacokinetics: This is an aminoglycoside antibiotic. One-hour ('peak') serum concentration should not exceed 30 mg/litre; pre-dose ('trough') concentration should be less than 10 mg/litre
Dose: by IM injection or slow IV injection or infusion, 15mg/kg daily in 2 divided doses, increased to 22.5 mg/kg daily in 3 divided doses in severe infections; max. 1.5 g daily for up to 10 days (max. cumulative dose 15 g); child 15 mg/kg daily in 2 divided doses; neonate loading dose of 10 mg/kg then 15 mg/kg daily in 2 divided doses
Pregnancy: In second and third trimester***:*** Auditory or vestibular nerve damage.

- *Amikin Injection 500 mg*

AMOXYCILLIN

Indications: urinary tract infections, otitis media, sinusitis,
chronic bronchitis, invasive salmonellosis, gonorrhoea; endocarditis prophylaxis; Helicobacter pylori eradication.
Cautions: history of allergy; reduce dose in renal impairment; erythematous rashes in glandular fever and chronic lymphatic leukaemia, and possibly HIV infection.
Contra-indications: penicillin hypersensitivity
Side Effects: nausea, diarrhoea, rash, antibiotic-associated colitis.
Dose: by mouth, 250 mg every 8 hours, doubled in severe infections.
Child up to 10 years, 125 mg every 8 hours..

Severe or recurrent purulent respiratory infection, 3 g every 12 hours.
Dental abscess as a short course, 3 g repeated after 8 hours.
Urinary tract infections, 3 g repeated after 10-12 hours as a short course.
Gonorrhoea, single dose of 2-3 g with probenecid 1 g.
Otitis media, child 3-10 years, 750 mg twice daily for 2 days.
Pregnancy: Not known to be harmful
Breast feeding: Trace amounts in milk

- *Amoxil Capsules 250 mg, 500 mg*
- *Amoxil Suspension 250 mg/5 ml.*

AMOXYCILLIN & CLAVULINIC ACID

Indications: infections due to beta-lactamase-producing strains (where amoxicillin alone not appropriate) including:
respiratory-tract infections, bone and joint infections genito-urinary and abdominal infections. Cellulitis, animal bites severe dental infection with spreading cellulitis or dental infection not responding to first-line antibacterial.
Cautions: maintain adequate hydration with high doses (particularly during parenteral therapy).
Cholestatic jaundice: can occur either during or shortly after the use of co-amoxiclav.
An epidemiological study has shown that the risk of acute liver toxicity was about 6 times greater with co-amoxiclav than with amoxicillin. Cholestatic jaundice is more common in patients above the age of 65 years and in men (these reactions have only rarely been reported in children).
Jaundice is usually self-limiting and very rarely fatal. The duration of treatment should be appropriate to the indication and should not usually exceed 14 days.
Contra-indications: penicillin hypersensitivity, history of co-amoxiclav-associated or penicillin-associated jaundice or hepatic dysfunction.
Hepatic impairment: monitor liver function in liver disease.
Renal impairment: CrCl <30 ml/minute***:*** Do not use 875 mg tablet or extended release tablets. CrCl 10-30

ml/minute*:* 250-500 mg every 12 hours CrCl <10 ml/minute*:* 250-500 mg every 24 hours Hemodialysis*:* Moderately dialyzable, 250-500 mg every 24 hours; administer dose during and after dialysis. Do not use extended release tablets. Peritoneal dialysis*:* Moderately dialyzable, Amoxicillin*:* Administer 250 mg every 12 hours Clavulanic acid*:* Dose for CrCl <10 ml/minute Continuous arteriovenous or venovenous hemofiltration effects*:* Amoxicillin*:* ~50 mg of amoxicillin/L of filtrate is removed Clavulanic acid*:* Dose for CrCl <10 ml/minute

Pregnancy: not known to be harmful

Breast-feeding: trace amounts in milk, but appropriate to use.

Side Effects: Commonly*:* hepatitis, cholestatic jaundice Stevens-Johnson syndrome, toxic epidermal necrolysis, exfoliative dermatitis, vasculitis reported. Rarely*:* prolongation of bleeding time, dizziness, headache, convulsions (particularly with high doses or in renal impairment); superficial staining of teeth with suspension, phlebitis at injection site.

Dose: one 250/125 strength tablet every 8 hours; increased in severe infection to one 500/125 strength tablet every 8 hours. neonate*:* ml/kg of 125/31 suspension every 8 hours child 1 month–1 year 0.25 ml/kg of125/31 suspension every 8 hours, dose doubled in severe infection 1–6 years 5 ml of 125/31 suspension every 8 hours or 0.25 ml/kg of 125/31 suspension every 8 hours, dose doubled in severe infection 6–12 years 5 ml of 250/62 suspension every 8 hours or 0.15 ml/kg of 250/62 suspension every 8 hours, dose doubled in severe infection. Severe dental infections (but not generally first-line expressed as co-amoxiclav. adult and child over 12 years one 250/125 strength tablet every 8 hours for 5 days.

- *Amoxycillin & Clavulinic Acid 1.2 Gm. Inj Vials*
- *Augmentin Vials 1.2 G (Each Vial Contains 1g Amoxycillin & 200mg Clavulanic Acid*
- *Klavox 625mg, 1g*
- *Julmintin Susp.457mg/5ml.*

CARBAPENEMS

The carbapenems are beta-lactam antibacterial with a broad-spectrum of activity which includes many Gram-positive and Gram-negative bacteria, and anaerobes

DORIPENEM

Indications: Treatment of complicated intra-abdominal infections and complicated urinary tract infections (including pyelonephritis) due to susceptible aerobic gram-positive, aerobic gram-negative (including Pseudomonas aeruginosa), and anaerobic bacteria
Contra-indications: Known serious hypersensitivity to doripenem or other carbapenems (eg, ertapenem, imipenem, meropenem) or any component of the formulation; anaphylactic reactions to beta-lactam antibiotics.
Pregnancy: may be acceptable
Breast-feeding: unknown if excreted in breast milk; use caution.
Renal Impairment: : CrCl >50 ml/minute: No adjustment necessary. CrCl 30-50 ml/minute: 250 mg every 8 hours CrCl 11-29 ml/minute: 250 mg every 12 hours Hemodialysis: Dialyzable (~52% of dose removed during 4-hour session in ESRD patients) Intermittent HD: 250 mg every 24 hours; if treating infections caused by Pseudomonas aeruginosa, administer 500 mg every 12 hours on day 1, followed by 500 mg every 24 hours. CVVHDF: 250 mg every 12 hours.
Dosing: Hepatic Impairment There are no dosage adjustments provided in manufacturer's labeling (has not been studied). However, doripenem undergoes minimal hepatic metabolism.
Side Effects: Most common: Central nervous system: Headache. Gastrointestinal: Diarrhea, nausea. Less common: Cardiovascular: Phlebitis Dermatologic: Skin rash (includes allergic/bullous dermatitis), erythema, macular/ papular eruptions, urticaria, and erythema multiform), pruritus Gastrointestinal: Oral candidiasis, pseudomembranous colitis. Hematologic & oncologic: Anemia. Hepatic: Increased serum transaminases. Renal: Renal insufficiency. Miscellaneous: Vaginal infection. Rare: (Limited to important or life-threatening):

Anaphylaxis, leukopenia, neutropenia, pneumonia, seizure, Stevens-Johnson syndrome, thrombocytopenia, toxic epidermal necrolysis
Dose: A switch to appropriate oral antimicrobial therapy may be considered after 3 days of parenteral therapy and demonstrated clinical improvement.
Intra-abdominal infection, complicated, severe:
IV: 500 mg every 8 hours for 5-14 days. Note: 2010 IDSA guidelines recommend treatment duration of 4-7 days (provided source controlled). Not recommended for mild-to-moderate, community-acquired intra-abdominal infections due to risk of toxicity and the development of resistant organisms.
Urinary tract infection (complicated) or pyelonephritis:
IV: 500 mg every 8 hours for 10-14 days

AMPICILLIN

Indications: urinary-tract infections, otitis media, sinusitis, oral infections, bronchitis, uncomplicated community-acquired pneumonia (Haemophilus influenzae infections, invasive salmonellosis; listerial meningitis
Cautions: history of allergy; renal impairment; erythematous rashes common in glandular fever, cytomegalovirus infection, and acute or chronic lymphocytic leukaemia
Contra-indications: penicillin hypersensitivity
Side Effects: nausea; diarrhoea; rashes; rarely, antibiotic-associated colitis.
Dose: By intramuscular injection or intravenous injection or infusion, 500 mg every 4–6 hours; CHILD under 10 years, half adult dose
Endocarditis (in combination with another antibiotic if necessary), by intravenous infusion, 2 g every 6 hours, increased to 2 g every 4 hours e.g. in enterococcal endocarditis or if ampicillin used alone
Listerial meningitis (in combination with another antibiotic), by intravenous infusion, 2 g every 4 hours for 10–14 days; NEONATE 50 mg/kg every 6 hours; INFANT 1–3 months, 50–100 mg/kg every 6 hours; CHILD 3 months–12 years, 100 mg/kg every 6 hours (max. 12 g daily)

- *Ampicillin 0.5gm./Vial Inj*
- *Ampicillin 1 Gm./Vial /10ml. Inj*

AZITHROMYCIN

Indications: Treatment of acute otitis media due to H. influenzae, M. catarrhalis, or S. pneumoniae; pharyngitis/tonsillitis due to \ S. pyogenes, community-acquired pneumonia due to Chlamydia pneumonia, H. influenzae, M. pneumoniae, or S. pneumoniae; pelvic inflammatory disease (PID) due to C. trachomatis, N. gonorrhoeae, or M. hominis; genital ulcer disease (in men) due to H. ducreyi (chancroid); acute bacterial exacerbations of chronic obstructive pulmonary disease (COPD) due to H. influenzae, M. catarrhalis, or S. pneumoniae; acute bacterial sinusitis due to H. influenzae, M. catarrhalis, or S. pneumoniae; prevention of Mycobacterium avium complex (MAC) (alone or in combination with rifabutin) in patients with advanced HIV infection; treatment of disseminated MAC (in combination with ethambutol) in patients with advanced HIV infection; skin and skin structure infections (uncomplicated) due to S. aureus, S. pyogenes, or S. agalactiae; urethritis and cervicitis due to C. trachomatis or N. gonorrhoeae

Cautions: in patients with a predisposition to QT interval prolongation (including electrolyte disturbances and concomitant use of drugs that prolong the QT interval). Macrolides may aggravate myasthenia gravis.

Pregnancy: manufacturers advise use only if adequate alternatives not available

Breast-feeding: present in milk (use only if no suitable alternatives).

Hepatic impairment: use with caution in severe liver disease (may cause hepatotoxicity).

Renal impairment: use with caution if eGFR less than 10 ml/minute/1.73 m^2

Contra-indications: Hypersensitivity to azithromycin, other macrolide antibiotics, or any component of the formulation; history of cholestatic jaundice/hepatic dysfunction associated with prior azithromycin use

Side Effects: Gastrointestinal***:*** Diarrhea, nausea, pruritus, skin rash Gastrointestinal***:*** Abdominal pain, anorexia, stomach cramps, vomiting. Genitourinary***:*** Vaginitis. Acute renal failure, ageusia. Aggressive behavior, anaphylaxis, anemia, angioedema, anosmia, auditory disturbance, candidiasis, cardiac arrhythmia

(including ventricular tachycardia), chest pain, cholestatic jaundice, conjunctivitis (pediatric patients), deafness, DRESS syndrome, eczema, edema, enteritis, erythema multiforme (rare), fungal dermatitis, fungal infection, gastritis, hearing loss, hepatic failure, hepatic necrosis, hepatitis, hyperactivity, hyperkinesia, hypotension, increased liver enzymes, insomnia, interstitial nephritis, jaundice, leukopenia, melena, mucositis, nephritis, neutropenia (mild), oral candidiasis, pancreatitis, pharyngitis, pleural effusion, prolonged Q-T interval on ECG (rare), pseudomembranous colitis, pyloric stenosis, seizure, skin photosensitivity, Stevens-Johnson syndrome (rare), syncope, taste perversion, thrombocytopenia, tongue discoloration (rare), torsades de pointes (rare), toxic epidermal necrolysis (rare), vesiculobullous rash
Dose: Respiratory-tract infections (except community acquired pneumonia) otitis media, skin and soft-tissue infections, adult ***:*** oral capsule 500 mg once daily for 3 days or 500 mg on first day then 250 mg once daily for 4 days.
CHILD***:*** over 6 months 10 mg/kg once daily (max. 500 mg once daily) for 3 days; or based on body-weight (15–25 kg) 200 mg once daily for 3 days (26–35 kg) 300 mg once daily for 3 days (36–45 kg) 400 mg once daily for 3 days Community-acquired pneumonia low to moderate severity.
ADULT over 18 years 500 mg once daily for 3 days or 500 mg on first day then 250 mg once daily for 4 days high severity
ADULT over 18 years by intravenous infusion, 500 mg once daily for at least 2 days, then by mouth, 500 mg once daily; total duration 7–10 days (unlicensed when used by mouth for over 3 days) Uncomplicated gonorrhoea, Uncomplicated genital chlamydial infections and non-gonococcal urethritis
ADULT over 18 years, 1 g as a single dose Lyme disease mild to moderate typhoid due to multiple-antibacterial-resistant organisms [unlicensed indications],
ADULT over 18 years 500 mg once daily for 7–10 days (7 days in typhoid).

- *Azithromycin 250 mg capsule*
- *Azithromycin 500 mg vial.*
- *Zithromax suspension 200 mg ().*

AZTREONAM

Indications: Gram-negative infections including Pseudomonas aeruginosa, Haemophilus influenzae, and Neisseria meningitidis

Caution: hypersensitivity to beta-lactam antibiotics; hepatic impairment; renal impairment**,** breast feeding

Contra-indications: hypersensitivity; pregnancy,

Side Effects: nausea, vomiting, diarrhoea, abdominal cramps; mouth ulcers, altered taste; jaundice and hepatitis; flushing; hypersensitivity reactions; blood disorders (including thrombocytopenia and neutropenia); rashes, injection-site reactions; rarely hypotension, seizures, asthenia, confusion, dizziness, headache, halitosis, and breast tenderness; very rarely antibiotic-associated colitis, gastro-intestinal bleeding, and toxic epidermal necrolysis

Dose: By deep intramuscular injection or by intravenous injection over 3–5 minutes or by intravenous infusion, 1 g every 8 hours or 2 g every 12 hours; 2 g every 6–8 hours for severe infections (including systemic *Pseudomonas aeruginosa* and lung infections in cystic fibrosis); single doses over 1 g intravenous route only

Urinary-tract infections, 0.5–1 g every 8–12 hours

CHILD over 1 week, by intravenous injection or infusion, 30 mg/kg every 6–8 hours increased in severe infections for child of 2 years or older to 50 mg/kg every 6–8 hours; max. 8 g daily

Gonorrhoea, cystitis, by intramuscular injection, 1 g as a single dose

- *Azactam 1 G Vial (Aztreonam 1 Gm. IM & IV Inj)*

BENZATHINE PENICILLIN

Indications: syphilis; penicillin-sensitive infections, active against some gram positive organisms and against few gram negative organisms e.g. Neisseria gonorrhoea

Cautions: avoid intravascular route since ischaemic reactions may occur

Contra-indications: hypersensitivity to penicillin

Side Effects: hypersensitivity reactions including urticaria, fever, joint pains, rashes, angioedema, anaphylaxis, serum sickness-like reaction; *rarely* CNS toxicity including convulsions (especially with high doses

or in severe renal impairment), interstitial nephritis, haemolytic anaemia, leucopenia, thrombocytopenia, and coagulation disorders; also reported diarrhoea (including antibiotic-associated colitis)
Dose: deep IM injection in usual dose of 900 mg for treatment of streptococcal infections Children may be given IM doses of 225-675 mg according to body weight To prevent recurrences of acute rheumatic fever, 900 mg IMevery 4 weeks.
Note: 900 mg of Benzathine penicillin = 720 mg of Benzylpenicillin (1.2 million units) approximately.

- *Penadur Injection 1, 200, 000 IU.*

BENZYL PENICILLIN

Indications: throat infections, otitis media, endocarditis, meningococcal disease, pneumonia, cellulitis; anthrax; prophylaxis in limb amputation
Caution history of allergy; false-positive urinary glucose (if tested for reducing substances); renal impairment
Contra-indications: penicillin hypersensitivity
Side Effects: hypersensitivity reactions including urticaria, fever, joint pains, rashes, angioedema, anaphylaxis, serum sickness-like reaction; *rarely* CNS toxicity including convulsions (especially with high doses or in severe renal impairment), interstitial nephritis, haemolytic anaemia, leucopenia, thrombocytopenia, and coagulation disorders; also reported diarrhoea (including antibiotic-associated colitis)
Dose: By intramuscular or by slow intravenous injection or by infusion, 2.4–4.8 g daily in 4 divided doses, increased if necessary in more serious infections (single doses over 1.2 g intravenous route only); PRETERM NEONATE and NEONATE under 1 week, 50 mg/kg daily in 2 divided doses; NEONATE 1–4 weeks, 75 mg/kg daily in 3 divided doses; CHILD 1 month–12 years, 100 mg/kg daily in 4 divided doses; intravenous route recommended in neonates and infants.
Endocarditis (in combination with another antibacterial if necessary), by slow intravenous injection or by infusion, 7.2 g daily in 6 divided doses, increased if necessary (e.g. in enterococcal endocarditis or if benzyl penicillin used alone) to 14.4 g daily in 6 divided doses

Anthrax (in combination with other antibacterial, by slow intravenous injection or by infusion, 2.4 g every 4 hours; CHILD 150 mg/kg daily in 4 divided doses
Intrapartum prophylaxis against group B streptococcal infection, by slow intravenous injection or by infusion, initially 3 g then 1.5 g every 4 hours until delivery
Meningococcal disease, by slow intravenous injection or by infusion, 2.4 g every 4 hours; PRETERM NEONATE and NEONATE under 1 week, 100 mg/kg daily in 2 divided doses; NEONATE 1–4 weeks, 150 mg/kg daily in 3 divided doses; CHILD 1 month–12 years, 180–300 mg/kg daily in 4–6 divided doses
Important. If bacterial meningitis and especially if meningococcal disease is suspected*:* a single injection of benzylpenicillin by intravenous injection (or by intramuscular injection) followed by continuous monitoring at the hospital. Suitable doses are*:*
ADULT 1.2 g; INFANT under 1 year 300 mg; CHILD 1–9 years 600 mg, 10 years and over as for adult.
By intrathecal injection, not recommended

- *Crystapen Injection 1000, 000 I U./Vial (1 Mega Unit)*
- *Benzyl Penicillin 1 Mega Units IV.*

CEFADROXIL MONOHYDRATE

Indications: infections due to sensitive Gram-positive and Gram-negative bacteria; useful in urinary tract infections; poor activity against H. influenzae, respiratory tract infections; otitis media; sinusitis; skin and soft tissue infections.
Cautions: penicillin sensitivity; renal impairment, false positive urinary glucose (if tested for reducing substances) and false positive coomb's test; pregnancy*:* & breast feeding.
Contra-indications: cephalosporin hypersensitivity; porphyria
Side Effects: diarrhoea and rarely antibiotic-associated colitis (both more likely with higher doses), nausea and vomiting, abdominal discomfort, headache; allergic reactions including rashes, pruritus, urticaria, serum sickness-like reactions with rashes, fever and arthralgia, and anaphylaxis; Stevens-Johnson syndrome, toxic epidermal necrolysis reported; disturbances in liver

enzymes, transient hepatitis and cholestatic jaundice; other side effects: reported include eosinophilia and blood disorders (including thrombocytopenia, leucopenia, agranulocytosis, aplastic anaemia and haemolytic anaemia); reversible interstitial nephritis, hyperactivity, nervousness, sleep disturbances, hallucinations, confusion, hypertonia, and dizziness

Dose: Patients over 40 kg, 0.5–1 g twice daily; skin, soft tissue, and simple urinary-tract infections, 1 g daily; CHILD under 1 year, 25 mg/kg daily in divided doses; 1–6 years, 250 mg twice daily; over 6 years, 500 mg twice daily

- *Duricef Capsules 500 mg*
- *Cefadroxil (As Monohydrate) 500 mg. Cap*

CEFEPIME DIHYDROCHLORIDE MONOHYDRATE

Indications: Reserved to treat severe nosocomial pneumonia, infections caused by multi-resistant microorganisms (e.g. Pseudomonas aeruginosa) and empirical treatment of febrile neutropenia.

Cefepime has good activity against important pathogens including Pseudomonas aeruginosa, Staphylococcus aureus, and multiple drug resistant Streptococcus pneumoniae. A particular strength is its activity against Enterobacteriaceae. Whereas other cephalosporins are degraded by many plasmid- and chromosome-mediated beta-lactamases, cefepime is stable and is a front line agent when infection with Enterobacteriaceae is known or suspected

Cautions: severe renal impairment. Prolonged use may result in super infection, history of penicillin allergy, especially IgE-mediated reactions (eg, anaphylaxis, urticaria); May cause antibiotic-associated colitis or colitis secondary to C. difficile.

Contra-indications: Cephalospotin hypersensitivity

Side Effects: diarrhea and rarely antibiotic-associated colitis, nausea and vomiting, abdominal discomfort, headache; allergic reactions including rashes, pruritus, urticaria, serum sickness-like reactions with rashes, fever and arthralgia, and anaphylaxis; Stevens-Johnson syndrome, toxic epidermal necrolysis; disturbances in liver enzymes, transient hepatitis and cholestatic jaundice;

other side effects: reported include eosinophilia and blood disorders (including thrombocytopenia, leucopenia, agranulocytosis, aplastic anaemia and haemolytic anaemia); reversible interstitial nephritis, hyperactivity, nervousness, sleep disturbances, hallucinations, confusion, hypertonia, and dizziness

- *Cefepime Dihydrochloride Monohydrate Inj 1gm*

CEFTAZIDIME

Indications: infections due to sensitive Gram-positive and Gram-negative bacteria; good activity against Pseudomonas.

Caution sensitivity to beta-lactam antibacterial (avoid if history of immediate hypersensitivity reaction); renal impairment; pregnancy***:*** and breast-feeding***: (***but appropriate to use); false positive urinary glucose (if tested for reducing substances) and false positive Coombs' test

Contra-indications: cephalosporin hypersensitivity

Side Effects: diarrhoea and rarely antibiotic-associated colitis (both more likely with higher doses), nausea and vomiting, abdominal discomfort, headache; allergic reactions including rashes, pruritus, urticaria, serum sickness-like reactions with rashes, fever and arthralgia, and anaphylaxis; Stevens-Johnson syndrome, toxic epidermal necrolysis reported; disturbances in liver enzymes, transient hepatitis and cholestatic jaundice; other side effects: reported include eosinophilia and blood disorders (including thrombocytopenia, leucopenia, agranulocytosis, aplastic anaemia and haemolytic anaemia); reversible interstitial nephritis, hyperactivity, nervousness, sleep disturbances, hallucinations, confusion, hypertonia, and dizziness

Dose: By deep intramuscular injection or intravenous injection or infusion, 1 g every 8 hours or 2 g every 12 hours; 2 g every 8–12 hours or 3 g every 12 hours in severe infections; single doses over 1 g intravenous route only;

elderly usual max. 3 g daily;

child, up to 2 months 25–60 mg/kg daily in 2 divided doses, over 2 months 30–100 mg/kg daily in 2–3 divided doses; up to 150 mg/kg daily (max. 6 g daily) in 3 divided

doses if immunocompromised or meningitis; intravenous route recommended for children.
Urinary-tract and less serious infections, 0.5–1 g every 12 hours
Pseudomonal lung infection in cystic fibrosis, adult 100–150 mg/kg daily in 3 divided doses; child up to 150 mg/kg daily (max. 6 g daily) in 3 divided doses; intravenous route recommended for children
Surgical prophylaxis, prostatic surgery, 1 g at induction of anaesthesia repeated if necessary when catheter removed

- *Ceftazidime 1g. IM, IV Inj*
- *Fortum Injection, Powder For Reconstitution, Ceftazidime (As Pentahydrate), With Sodium Carbonate, 1g, 2g Vial*

CEFTRIAXONE SOD

Indications: infections due to Gram-negative and Gram-positive microorganisms; septicaemia; ; meningitis; abdominal infections (peritonitis, infections of the biliary and gastro-intestinal tracts); infections of the bones, joints, soft tissue, skin and of wounds; infections in patients with impaired defense mechanisms; renal and urinary tract infections; respiratory tract infections, particularly pneumonia, and ear, nose and throat infections; genital tract infections including gonorrhea and perioperative prophylaxis of infections.
Caution anaphylactic shock cannot be ruled out; shadows suggesting sludge have been detected by sonograms of the gall bladder, but this is reversible upon discontinuation of therapy or completion; caution in hyperbilirubinemic neonates, especially prematures; blood picture should be checked regularly during prolonged treatment.
Contra-indications: known hypersensitivity to the cephalosporins; neotaes with jaundice
Side Effects: gastro-intestinal complaints; skin reactions; hematological changes and other rare side effects like headache, and mycosis of the genital tract; phlebitis may occur rarely after administration and it can be prevented by slow injection (two to four minutes).

Dose: by deep IM injection on IV injection over at least 2-4 minutes or by IV infusion, adults and children over 12 years, 1-2 g once daily.
In severe cases or infections caused by moderately sensitive organisms, up to 4 g once daily.
Uncomplicated gonorrhoea, by deep IM injection, 250 mg as a single dose.
Neonates (up to 2 weeks), by IV infusion over 60 minutes, 20-50
mg/kg daily (max. 50 mg/kg daily).
Child 3 weeks-12 years, 20-80 mg/kg daily
Child with body weight more than 50 kg, adult dose should be given.
IV doses of 50 mg more /kg should be given by infusion over at
least 30 minutes.
IM doses over 1 g divided between more than one site
Pregnancy: Not known to be harmful
Breast feeding: Present in milk in low concentration

- *Rocephin 1 g I.V, Injection.)*

CEFUROXIME.

Indications: surgical prophylaxis; more active against Haemophilus influenzae; Lyme disease mild to moderate lower respiratory-tract infections (e.g. bronchitis); doubled for more severe lower respiratory-tract infections or if pneumonia suspected Urinary-tract infection Open fractures, prophylaxis
Cautions: sensitivity to beta-lactam antibacterial (avoid if history of immediate hypersensitivity reaction); false positive urinary glucose (if tested for reducing substances) and false positive Coombs' test
Contra-indications: cephalosporin hypersensitivity
Renal impairment no dose adjustment required—manufacturer advises caution
Pregnancy not known to be harmful
Breast-feeding present in milk in low concentration, but appropriate to use
Side Effects: diarrhoea (rarely antibiotic-associated colitis), nausea and vomiting, abdominal discomfort, headache; allergic reactions including rashes, pruritus, urticaria, serum sickness-like reactions with rashes, fever and arthralgia, and anaphylaxis; Stevens-Johnson

syndrome, toxic epidermal necrolysis reported; disturbances in liver enzymes, transient hepatitis and cholestatic jaundice; other side effects reported include eosinophilia and blood disorders (including thrombocytopenia, leucopenia, agranulocytosis, aplastic anaemia and haemolytic anaemia); reversible interstitial nephritis, hyperactivity, nervousness, sleep disturbances, hallucinations, confusion, hypertonia, and dizziness
Dose: By mouth (as cefuroxime axetil), 250 mg twice daily in most infections including mild to moderate lower respiratory-tract infections (e.g. bronchitis); doubled for more severe lower respiratory-tract infections or if pneumonia suspected Urinary-tract infection, 125 mg twice daily, doubled in pyelonephritis child over 3 months, 125 mg twice daily, if necessary doubled in child over 2 years with otitis media Lyme disease, adult and child over 12 years, 500 mg twice daily for 14–21 days (for 28 days in Lyme arthritis) [unlicensed duration] By intramuscular injection or intravenous injection or infusion, 750 mg every 6–8 hours; 1.5 g every 6–8 hours in severe infections; single doses over 750 mg intravenous route only child usual dose 60 mg/kg daily (range 30–100 mg/kg daily) in 3–4 divided doses (2–3 divided doses in neonates) Surgical prophylaxis, 1.5 g by intravenous injection up to 30 minutes before the procedure; up to 3 further doses of 750 mg may be given by intramuscular or intravenous injection every 8 hours for high-risk procedures Open fractures, prophylaxis, by intravenous injection or infusion, 1.5 g every 8 hours until soft-tissue closure (max. duration 72 hours)

- *Zinnat 250mg, 500mg Tab (Cefuroxime Axetil).*
- *Zinacef 750mg/ Vial (Cefuroxime Sodium)*
- *Zinnat 125mg/5ml, 250mg/5ml susp.).*

CEFOTAXIME SOD

This is a third generation cephalosporin.
Indications: septicaemia, endocarditis and meningitis, except those due to Listeria monocytogenes, gonorrhoea; surgical prophylaxis; Haemophilus epiglottitis and meningitis
Caution allergy to cephalosporins or penicillin

Side Effects: allergic reaction; digestive disorders; transient hematological changes; hepatic function changes; phlebitis after injection.
Dose: by IM or IV injection or IV infusion, 1 g every 12 hours increased in severe infections such as meningitis to 8 g daily in 4 divided doses. Up to 12 g in 3-4 divided doses may be given. Neonate, 50 mg/kg in 2-4 divided doses increased to 150-200 mg/kg daily in severe infections.
Child, 100-150 mg/kg daily in 2-4 divided doses increased to 200 mg/kg daily in very severe infections
Gonorrhoea, 500 mg as a single dose.

- *Claforan*
- *Cefotoxime Sod. 1gm/Vial IV Inj*

CEPHALEXIN

Indications: infections due to sensitive Gram-positive and Gram-negative bacteria.
Cautions: penicillin sensitivity; renal impairment; pregnancy and breast-feeding.
Contra-indications: cephalosporin hypersensitivity; porphyria
Side Effects: allergic reactions including urticaria and rashes, hypersensitivity reactions including anaphylaxis, nausea, vomiting, diarrhoea, false positive results for glucose in urine with reducing substances, reduce also in renal impairment
Dose: 250 mg every 6 hours or 500 mg every 8-12 hours. In severe infections, 1-1.5 g every 6-8 hours.
child 25 mg/kg daily in divided doses, doubled for severe infections, max. 100 mg/kg daily; or under 1 year 125 mg every 12 hours, 1–5 years 125 mg every 8 hours, 6–12 years 250 mg every 8 hours
Prophylaxis of recurrent urinary-tract infection, adult 125 mg at night

- *Cephalexin 250 mg, Cap.*
- *Cephalexin 250 mg/ 5 ml Susp*

CIPROFLOXACIN

Indications: infections of respiratory tract (except for pneumococcal pneumonia), middle ear (otitis media) and paranasal sinuses (sinusitis), genital organs, abdominal

cavity, skin and soft tissues, bones and joints and septicaemia.
Caution elderly patients; renal impairment; epileptics and patients with damage to the central nervous system; ensure adequate fluid intake.
Contra-indications: hypersensitivity to ciprofloxacin or other quinolone chemotherapeutics; pediatrics; nursing or pregnant women.
Side Effects: gastro-intestinal effects like nausea, diarrhoea and vomiting, flatulence; headache, dizziness, sleep disorders; rash, pruritis; *rarely* dysphagia, pancreatitis, tachycardia, hypotension, oedema, hot flushes, sweating, hyperglycaemia, and erythema nodosum; very rarely movement disorders, tinnitus, vasculitis, and tenosynovitis
Dose: by mouth, respiratory tract infections, 250-750 mg twice daily, for 7-14 days.
Urinary tract infections, 250-500 mg twice daily.
Acute uncomplicated cystitis in women, 100 mg twice daily for 3 days.
A single oral dose of of 500 mg has been suggested for the treatment of gonorrhea

- *Ciprofloxacin Hydrochloride 500 mg Tab.*
- *Ciprolon Tablets 500 mg*
- *Ciprofloxacin 200mg/ 50ml Inj*

CLARTIHROMYCIN

Indications: respiratory-tract infections, mild to moderate skin and soft-tissue infections, otitis media; Lyme disease prevention of pertussis (Table Helicobacter pylori eradication.
Cautions: used with caution in patients with a predisposition to QT interval prolongation (including electrolyte disturbances and concomitant use of drugs that prolong the QT interval). Macrolides may aggravate myasthenia gravis. hepatic impairment hepatic dysfunction including jaundice reported. avoid in severe impairment (if renal impairment also present).
Renal impairment: use half normal dose if eGFR less than 30 ml/minute/1.73 m^2, max. duration 14 days
avoid Klacid XL or clarithromycin m/r preparations if eGFR less than 30 ml/minute/1.73 m^2

Pregnancy: manufacturer advises avoid, particularly in the first trimester (unless potential benefit outweighs risk)
Breast-feeding: manufacturer advises avoid (unless potential benefit outweighs risk—present in milk).
Contra-indications: Hypersensitivity to clarithromycin, erythromycin, any of the macrolide antibiotics, or any component of the formulation. history of cholestatic jaundice/hepatic dysfunction associated with prior use of clarithromycin history of QT prolongation or ventricular cardiac arrhythmia (including torsade de pointes) concomitant use with cisapride, pimozide, ergotamine, dihydroergotamine, HMG-CoA reductase inhibitors extensively metabolized by CYP3A4 (eg, lovastatin, simvastatin), astemizole or terfenadine concomitant use with colchicine in patients with renal or hepatic impairment.
Side Effects: Most common : dyspepsia, taste disturbances, headache, insomnia, hyperhidrosis less commonly***:*** gastritis, flatulence, constipation, dry mouth, stomatitis, glossitis, anorexia, chest pain, anxiety, dizziness, tremor, malaise, blood disorders (including leucopenia), myalgia, tinnitus. also reported***:*** confusion, psychotic disorders, depression, abnormal dreams, convulsions, paraesthesia, hypoglycaemia, renal failure, interstitial nephritis, myopathy, tooth and tongue discoloration, smell disturbances.
Dose: ADULT and CHILD over 12 years 250 mg every 12 hours, increased in pneumonia or severe infections to 500 mg every 12 hours usual duration 7–14 days. CHILD body-weight under 8 kg; 7.5 mg/kg twice daily 8–11 kg; 62.5 mg twice daily 12–19 kg; 125 mg twice daily 20–29 kg; 187.5 mg twice daily 30–40 kg: 250 mg twice daily Lyme disease. ADULT and CHILD over 12 years 500 mg every 12 hours for 14–21 days.

- *Kalcid 500mg tablet*
- *Kalcid XL 500mg. Tablets*
- *Kalcid 500mg IV.*
- *Kalcid 125mg/5ml syrup*

CLINDAMYCIN

Indications: staphylococcal bone and joint infections, peritonitis; endocarditis prophylaxis.

Caution discontinue immediately if diarrhoea or colitis develops; hepatic impairment, renal impairment; monitor liver and renal function on prolonged therapy and in neonates and infants; pregnancy**,** breast-feeding, void rapid intravenous administration; avoid in porphyria
Contra-indications: diarrhoea states.
Side Effects: diarrhoea (discontinue treatment), abdominal discomfort, oesophagitis, nausea, vomiting, antibiotic-associated colitis; jaundice; leucopenia, eosinophilia, and thrombocytopenia reported; rash, pruritus, urticaria, anaphylactoid reactions, Stevens-Johnson syndrome, exfoliative and vesiculobullous dermatitis; pain, induration, and abscess after intramuscular injection; thrombophlebitis after intravenous injection.
Dose: By mouth, 150–300 mg every 6 hours; up to 450 mg every 6 hours in severe infections;
CHILD, 3–6 mg/kg every 6 hours
By deep intramuscular injection or by intravenous infusion, 0.6–2.7 g daily (in 2–4 divided doses); life-threatening infection, up to 4.8 g daily; single doses above 600 mg by intravenous infusion only; single doses by intravenous infusion not to exceed 1.2 g; CHILD over 1 month, 15–40 mg/kg daily in 3–4 divided doses; severe infections, at least 300 mg daily regardless of weight

- *Clindamycin 300 mg/2 ml. Inj*
- *Dalacin C Injection 300 mg/ 2 ml*

CLOXACILLIN

Indications: infections due to penicillinase-producing staphylococci causing respiratory tract, skin, bone & joint, urinary tract infections.
Caution history of allergy; false-positive urinary glucose (if tested for reducing substances); renal impairment
Contra-indications: penicillin hypersensitivity
Side Effects: hypersensitivity reactions including urticaria, fever, joint pains, rashes, angioedema, anaphylaxis, serum sickness-like reaction; *rarely* CNS toxicity including convulsions (especially with high doses or in severe renal impairment), interstitial nephritis, haemolytic anaemia, leucopenia, thrombocytopenia, and coagulation disorders; also reported diarrhoea (including antibiotic-associated colitis)

Dose: By mouth, 250–500 mg every 6 hours, at least 30 minutes before food; child under 2 years quarter adult dose; 2–10 years half adult dose
By intramuscular injection, 250–500 mg every 6 hours; child under 2 years quarter adult dose; 2–10 years half adult dose
By slow intravenous injection or by intravenous infusion, 0.25–2 g every 6 hours; child under 2 years quarter adult dose; 2–10 years half adult dose
Endocarditis (in combination with another antibacterial, body-weight under 85 kg) 8 g daily in 4 divided doses; body-weight over 85 kg, 12 g daily in 6 divided doses
Osteomyelitis, up to 8 g daily in 3–4 divided doses

- *Cloxacillin 125mg5ml Susp*
- *Cloxacillin Sodium 250 mg, 500 mg - Capsules*
- *Cloxacillin Sodium 500 mg/Vial IM. IV*
- *Orbenin Injection 500 mg.*
- *Orbenin Syrup 125 mg/5 ml & 250 mg/5 ml.*
- *Prostaphlin-A Capsules 250 mg & 500 mg.*
- .

COLISTIMETHATE SODIUM COLISTIN (Colistin sulfomethate sodium)

Indications: The polymyxin antibiotic, colistimethate sodium, is active against Gram-negative organisms including Pseudomonas aeruginosa, Acinetobacter baumanii, and Klebsiella pneumoniae. It is not absorbed by mouth and thus needs to be given by injection for a systemic effect. Intravenous administration of colistimethate sodium should be reserved for Gram-negative infections resistant to other antibacterial; its major adverse effects are dose-related neurotoxicity and nephrotoxicity.
Colistimethate sodium is also given by inhalation as an adjunct to standard antibacterial therapy in patients with cystic fibrosis
Cautions: acute porphyria Specific cautions for parenteral treatment Monitor renal function Specific cautions for inhaled treatment Other inhaled drugs should be administered before colistimethate sodium. Measure lung function before and after initial dose of colistimethate sodium and monitor for bronchospasm; if bronchospasm occurs in a patient not using a

bronchodilator, repeat test using a bronchodilator before the dose of colistimethate sodium. Severe haemoptysis (risk of further haemorrhage)
Contra-indications: myasthenia gravis
Renal impairment reduce dose and monitor plasma-colistimethate sodium concentration during parenteral treatment.
Pregnancy clinical use suggests probably safe when used by inhalation (use parenteral treatment only if potential benefit outweighs risk).
Breast-feeding present in milk but poorly absorbed from gut; manufacturers advise avoid (or use only if potential benefit outweighs risk)
Side Effects: Sore throat, sore mouth, taste disturbances, nausea, vomiting, cough, bronchospasm, dysphonia; less commonly thirst, hypersalivation.
Dose: By slow intravenous injection into a totally implantable venous access device, or by intravenous infusion (but see notes above), adult and child body-weight under 60 kg, 50 000–75 000 units/kg daily in 3 divided doses; body-weight over 60 kg, 1–2 million units every 8 hours
NOTE: Plasma concentration monitoring recommended in renal impairment; recommended 'peak' plasma-colistimethate sodium concentration (approx. 1 hour after intravenous injection or infusion) 5–15 mg/litre, pre-dose ('trough') concentration 2–6 mg/litre
By inhalation of nebulised solution, adult and child over 2 years, 1–2 million units twice daily; increased to 2 million units 3 times daily for subsequent respiratory isolates of Ps. aeruginosa; child 1 month–2 years, 0.5–1 million units twice daily; increased to 1 million units 3 times daily for subsequent respiratory isolates of Ps. aeruginosa
By inhalation of powder, adult and child over 6 years, 1.66 million units twice daily

- *Colomycin Injection, powder for reconstitution, 1 million-unit vial*

COTRIMIXAZOLE

Indications: drug of choice in ***:*** prophylaxis and treatment of Pneumocystis jiroveci (Pneumocystis carinii) pneumonia. it is also indicated for nocardiasis,

Stenotrophomonasmaltophilia infection and toxoplasmosis. It should only be considered for use in acute exacerbations of chronic bronchitis and infections of the urinary tract when there is bacteriological evidence of sensitivity to co-trimoxazole and good reason to prefer this combination to a single antibacterial*:* similarly it should only be used in acute otitis media in children when there is good reason to prefer it. Co-trimoxazole is also used for the treatment of infections caused by Burkholderiacepacia.

Cautions: maintain adequate fluid intake, avoid in blood disorders (unless under specialist supervision), monitor blood counts on prolonged treatment, discontinue immediately if blood disorders or rash develop, predisposition to folate deficiency or hyperkalaemia elderly, asthma, G6PD deficiency avoid in infants under 6 weeks (except for treatment or prophylaxis of pneumocystis pneumonia).

Contra-indications: acute porphyria

Hepatic impairment: manufacturer advises avoid in severe liver disease

Renal impairment: use half normal dose if eGFR 15–30 ml/minute/1.73 m^2, avoid if eGFR less than 15 ml/minute/1.73 m^2 and if plasma-sulfamethoxazole concentration cannot be monitored

Pregnancy: teratogenic risk in first trimester (trimethoprim a folate antagonist). Neonatal haemolysis and methaemoglobinaemia in third trimester, fear of increased risk of kernicterus in neonates appears to be unfounded.

Breast-feeding: small risk of kernicterus in jaundiced infants and of haemolysis in G6PD-deficient infants (due to sulfamethoxazole).

Side Effects: Most common*:* nausea, diarrhoea; headache; hyperkalaemia; rash (very rarely including Stevens-Johnson syndrome, toxic epidermal necrolysis, photosensitivity)—discontinue immediately. less commonly*:* vomiting. very rarely*:* glossitis, stomatitis, anorexia, liver damage (including jaundice and hepatic necrosis), pancreatitis, antibiotic-associated colitis, myocarditis, cough and shortness of breath, pulmonary infiltrates, aseptic meningitis, depression, convulsions, peripheral neuropathy, ataxia, tinnitus, vertigo,

hallucinations, hypoglycaemia, blood disorders (including leucopenia, thrombocytopenia, megaloblasticanaemia, eosinophilia), hyponatraemia, renal disorders including interstitial nephritis, arthralgia, myalgia, vasculitis, systemic lupus erythematosus and uveitis; rhabdomyolysis reported in HIV-infected patients.
Dose: By oral Adult***:*** 960 mg every 12 hours. CHILD every 12 hours 6 weeks–5 months 120 mg 6 months–5 years 240 mg 6–12 years 480 mg CHILD***:*** 36 mg/kg daily in 2 divided doses increased to 54 mg/kg daily in severe infections Treatment of Pneumocystis jiroveci (Pneumocystis carinii) infections (undertaken where facilities for appropriate monitoring available by mouth or by intravenous infusion
ADULT and CHILD over 4 weeks 120 mg/kg daily in 2–4 divided doses for 14–21 days. Prophylaxis of Pneumocystis jiroveci (Pneumocystis carinii) infections 960 mg once daily (may be reduced to 480 mg once daily to improve tolerance) or 960 mg on alternate days (3 times a week) Or 960 mg twice daily on alternate days (3 times a week). CHILD 6 weeks–5 months 120 mg twice daily on 3 consecutive Or alternate days per week or on 7 days per week. 6 months–5 years 240 mg 6–12 years 480 mg

- *Cotrimixazole Tab (400 mg Sulphamethoxazole + 80 mg Trimethoprim)*
- *Co-Trimoxazole Syp 100ml (200 mg Sulphamethoxazole + 40 mg Trimethoprim/ 5 ml)*
- *Septrin Double-Strength Tablets (800 mg Sulphamethoxazole + 160 mg Trimethoprim)*
- *Bactrim / Septrin Infusion (80 mg Trimethoprim & 400 mg Sulphamethoxazole In Each 5 ml Ampoule)*

DAPTOMYCIN

Indications: complicated skin and soft-tissue infections caused by Gram-positive bacteria. Staphylococcal endocarditis

Cautions: interference with assay for prothrombin time and INR (take blood sample immediately before daptomycin dose).

Muscle effects: Myalgia, muscle weakness, and myositis may occur uncommonly; rhabdomyolysis is very rare. Monitor creatine kinase before treatment and then weekly during treatment (more frequently if creatine kinase elevated more than 5 times upper limit of normal before treatment, or if receiving another drug known to cause myopathy (preferably avoid concomitant use), or if eGFR less than 80 ml/minute/1.73 m^2). If unexplained muscle pain, tenderness, weakness, or cramps develop during treatment, measure creatine kinase every 2 days; discontinue if unexplained muscular symptoms and creatine kinase elevated markedly
Contra-indications: Hypersensitivity
Hepatic impairment: Manufacturer advises caution in severe hepatic impairment—no information available
Renal impairment: monitor renal function if eGFR less than 80 ml/minute/1.73 m^2; use normal dose every 48 hours if eGFR less than 30 ml/minute/1.73m^2
Pregnancy: Manufacturer advises use only if potential benefit outweighs risk no information available
Breast-feeding: Present in milk in small amounts, but absorption from gastro- intestinal tract negligible>
Side Effects: nausea, vomiting, abdominal pain, flatulence, diarrhoea (antibiotic-associated colitis reported), constipation, hypertension, hypotension, headache, anxiety, insomnia, dizziness, asthenia, anemia, arthralgia, rash, pruritus, injection-site reactions.
less commonly: dyspepsia, anorexia, taste disturbance, glossitis, flushing, arrhythmias, tremor, paraesthesia, hyperglycemia, renal failure, eosinophilia, thrombocythaemia, electrolyte disturbances, muscle effects, rarely: jaundice; also reported syncope, wheezing, eosinophilic pneumonia, peripheral neuropathy
Dose: By slow intravenous injection over 2 minutes *or* by intravenous infusion: complicated skin and soft-tissue infections caused by Gram-positive bacteria.
ADULT over 18 years: 4 mg/kg once daily; increased to 6 mg/kg once daily if associated with Staphylococcus aureus bacteremia. Staphylococcal endocarditis: adult over 18 years, : 6 mg/kg once daily

- *Cubicin Intravenous infusion, powder for reconstitution, net price 350-mg vial*

DOXYCYCLINE HYCLATE

Indications: chronic prostatitis; sinusitis, syphilis, pelvic inflammatory disease, treatment and prophylaxis of anthrax; malaria treatment and prophylaxis, recurrent aphthous ulceration, adjunct to gingival scaling and root planning for periodontitis; oral herpes simplex; rosacea, acne vulgaris
Cautions: hepatic impairment; alcohol dependence; photosensitivity (avoid exposure to sunlight or sun lamps); porphyria
Contra-indications: Deposition in growing bone & teeth causes staining & dental hyperplasia in children below 12 years***:*** pregnancy, breast feeding.
Side Effects: nausea, vomiting, diarrhoea, dysphagia, oesophageal irritation, anorexia, flushing, and tinnitus, rarely hepatotoxicity, pancreatitis, blood disorders, hypersensitivity reactions.
Dose: 200 mg on first day, then 100 mg daily; severe infections (including refractory urinary-tract infections), 200 mg daily
Early syphilis, 100 mg twice daily for 14 days; late latent syphilis 200 mg twice daily for 28 days
Uncomplicated genital chlamydia, non-gonococcal urethritis, 100 mg twice daily for 7 days (14 days in pelvic inflammatory disease Anthrax (treatment or post-exposure prophylaxis, 100 mg twice daily;
CHILD (only if alternative antibacterial cannot be given) 5 mg/kg daily in 2 divided doses (max. 200 mg daily)
Pregnancy: First trimester; Effects on skeletal development in animal studies
Second and Third trimester; Dental discoloration; maternal hepatotoxicity with large parenteral doses
Breast feeding: Avoid (although absorption and therefore discoloration of teeth in infant probably usually prevented by chelation with calcium in milk)

- *Doxycycline Hyclate 100 mg Cap (Vibramycin)*
- *Doxydar Capsules 100 mg*

ERTAPENEM

A beta-lactam and belongs to the subgroup of carbapenems

Indications*:* abdominal infections; acute gynaecological infections; community-acquired pneumonia diabetic foot infections of the skin and soft-tissue; prophylaxis for colorectal surgery Complicated Urinary Tract Infections (Including Pyelonephritis) Acute Pelvic Infections Complicated Intra-abdominal Infections
Cautions*:* Sensitivity to beta-lactam antibacterial (avoid if history of immediate hypersensitivity reaction, elderly, CNS disorders—risk of seizures; interactions**:** Hypersensitivity reactions The most important side-effect of the penicillin is hypersensitivity which causes rashes and anaphylaxis and can be fatal. Allergic reactions to penicillin occur in 1–10% of exposed individuals; anaphylactic reactions occur in fewer than 0.05% of treated patients. Patients with a history of atopic allergy (e.g. asthma, eczema, hay fever) are at a higher risk of anaphylactic reactions to penicillin. Individuals with a history of anaphylaxis, urticaria, or rash immediately after penicillin administration are at risk of immediate hypersensitivity to penicillin; these individuals should not receive a penicillin. Patients who are allergic to one penicillin will be allergic to all because the hypersensitivity is related to the basic penicillin structure. As patients with a history of immediate hypersensitivity to penicillin may also react to the cephalosporin and other beta-lactam antibiotics, they should not receive these antibiotics; ztreonam may be less likely to cause hypersensitivity in penicillin-sensitive patients and can be used with caution. If a penicillin (or another beta-lactam antibiotic) is essential in an individual with immediate hypersensitivity to penicillin then specialist advice should be sought on hypersensitivity testing or using a beta-lactam antibiotic with a different structure to the penicillin that caused the hypersensitivity Individuals with a history of a minor rash (i.e. non- confluent, non-pruritic rash restricted to a small area of the body) or a rash that occurs more than 72 hours after penicillin administration are probably not allergic to penicillin and in these individuals a penicillin should not be withheld unnecessarily for serious infections; the possibility of an allergic reaction should, however, be borne in mind. Other beta-lactam antibiotics (including cephalosporins) can be used in these patients.

Renal impairment Risk of seizures; max. 500 mg daily if eGFR less than 30 ml/minute/1.73 m^2
Pregnancy*:* Manufacturer advises avoid unless potential benefit outweighs risk
Breast-feeding*:* Present in milk—manufacturer advises avoid
Note*:* Do not confuse with other medications or use dextrose diluent Prolonged use increases risk of super infections Use caution in renal impairment; adjust dose in moderate to severe renal dysfunction Carbapenem use may decrease serum levels of divalproex sodium or valproic acid
Contra-indications: Hypersensitivity to ertapenem, beta-lactams, or other drugs in this class IM administration**:** Hypersensitivity to amide local anesthetics (eg, lidocaine)
Side Effects: Diarrhoea, nausea, vomiting, headache, injection-site reactions, rash (also reported with eosinophilia and systemic symptoms), pruritus, raised platelet count; less commonly dry mouth, taste disturbances, dyspepsia, abdominal pain, anorexia, constipation, melaena, antibiotic-associated colitis, bradycardia, hypotension, chest pain, oedema, pharyngeal discomfort, dyspnea, dizziness, sleep disturbances, confusion, asthenia, seizures, raised glucose, petechiae; rarely dysphagia, cholecystitis, liver disorder (including jaundice), arrhythmia, increase in blood pressure, syncope, nasal congestion, cough, wheezing, anxiety, depression, agitation, tremor, pelvic peritonitis, renal impairment, muscle cramp, scleral disorder, blood disorders (including neutropenia, rombocytopenia, haemorrhage), hypoglycaemia, electrolyte disturbances; also reported hallucinations, dyskinesia
Dose: Powder for injection1g/vial For adult: Community-Acquired Pneumonia 1 g/day IV/IM up to 14 days; after ≥3 days of parenteral therapy, may be switched to appropriate PO regimen if patient improves clinically Complicated Urinary Tract Infections (Including Pyelonephritis) 1 g/day IV/IM up to 14 days; after ≥3 days of parenteral therapy, may be switched to appropriate PO regimen if patient improves clinically Acute Pelvic Infections 1 g/day IV/IM for 3-10 days Complicated Intra-abdominal Infections 1 g/day IV/IM for 5-14 days Complicated Skin/Skin Structure Infections

1 g/day IV/IM for 7-14 days; may be continued up to 4 weeks for diabetic foot infections, depending on severity of infection and response to therapy (treatment excludes diabetic foot infections with osteomyelitis)
Dosing Modifications
Renal impairment CrCl >30 ml/min/1.73 m²**:** Dosage adjustment not necessary
CrCl <30 ml/min/1.73 m² and end-stage renal disease (ESRD)**:** 500 mg/day IV
Dialysis**:** 500 mg/day IV; if given ≤6 hr before dialysis, supplemental dose of 150 mg afterward.
for pediatric:
Community-Acquired Pneumonia
<3 years**:** Safety and efficacy not established
3-12 years**:** 15 mg/kg IV/IM q12hr up to 14 days; not to exceed 1 g q12hr; after ≥3 days of parenteral therapy, may be switched to appropriate PO regimen if patient improves clinically
>12 years**:** 1 g/day IV/IM up to 14 days; after ≥3 days of parenteral therapy, may be switched to appropriate PO regimen if patient improves clinically
Complicated Urinary Tract Infections
(Including Pyelonephritis)
<3 years**:** Safety and efficacy not established
3-12 years**:** 15 mg/kg IV/IM q12hr up to 14 days; not to exceed 1 g q12hr; after ≥3 days of parenteral therapy, may be switched to appropriate PO regimen if patient improves clinically
>12 years**:** 1 g/day IV/IM up to 14 days; after ≥3 days of parenteral therapy, may be switched to appropriate PO regimen if patient improves clinically
Acute Pelvic Infections <3 years**:** Safety and efficacy not established 3-12 years**:** 15 mg IV/IM q12hr for 3-10 days
>12 years**:** 1 g/day IV/IM for 3-10 days
Complicated Intra-abdominal
Infections <3 years**:** Safety and efficacy not established
3-12 years**:** 15 mg IV/IM q12hr for 5-14 days
>12 years**:** 1 g/day IV/IM for 5-14 days
Complicated Skin/Skin Structure
Infections <3 years**:** Safety and efficacy not established
3-12 years**:** 15 mg IV/IM q12hr for 7-14 days; may be continued up to 4 weeks for diabetic foot infections, depending on severity of infection and response to therapy

(treatment excludes diabetic foot infections with osteomyelitis)
>12 years**:** 1 g/day IV/IM for 7-14 days; may be continued up to 4 weeks for diabetic foot infections, depending on severity of infection and response to therapy (treatment excludes diabetic foot infections with osteomyelitis)

- *Invanz Intravenous infusion, powder for reconstitution 1-g vial*

ERYTHROMYCIN

Indications: susceptible infections in patients with penicillin hypersensitivity; oral infections; campylobacter enteritis, syphilis, non-gonococcal urethritis, respiratory-tract infections (including Legionnaires' disease), skin infections; chronic prostatitis; diphtheria and whooping cough prophylaxis; acne vulgaris and rosacea
Caution neonate under 2 weeks (risk of hypertrophic pyloric stenosis); predisposition to QT interval prolongation (including electrolyte disturbances, concomitant use of drugs that prolong QT interval); porphyria; hepatic impairment; renal impairment; pregnancy and breast-feeding***:***
Side Effects: nausea, vomiting, abdominal discomfort, diarrhoea (antibiotic-associated colitis); less frequently urticaria, rashes and other allergic reactions; reversible hearing loss after large doses; cholestatic jaundice, pancreatitis, cardiac effects (including chest pain and arrhythmias), myasthenia-like syndrome, Stevens-Johnson syndrome, and toxic epidermal necrolysis.
Dose: By mouth, ADULT and CHILD over 8 years, 250–500 mg every 6 hours or 0.5–1 g every 12 hours up to 4 g daily in severe infections;
NEONATE 12.5 mg/kg every 6 hours;
CHILD 1 month–2 years 125 mg every 6 hours, 2–8 years 250 mg every 6 hours, doses doubled for severe infections.
Early syphilis, 500 mg 4 times daily for 14 days
Uncomplicated genital chlamydia, non-gonococcal urethritis, 500 mg twice daily for 14 days
By intravenous infusion, ADULT and CHILD severe infections, 50 mg/kg daily by continuous infusion or in divided doses every 6 hours; mild infections (oral

treatment not possible), 25 mg/kg daily; NEONATE 30–45 mg/kg daily in 3 divided doses

- *Erythromycin Base/ Ethylsuccinate/ Stearate Tab 250mg*
- *Erythromycin Ethylsuccinate 200mg/5ml Susp*
- *Erythromycin Injection 1 Gm IV*
- *Erythrocin Tablets 250 mg*
- *Erythrocin Syrup 200 mg/ 5 ml*

GENTAMICIN

Indications: septicaemia and neonatal sepsis; meningitis and other CNS infections; biliary-tract infection, acute pyelonephritis or prostatitis, endocarditis; pneumonia in hospital patients, adjunct in listerial meningitis

Caution pregnancy; renal impairment, neonates, infants and elderly (adjust dose and monitor renal, auditory and vestibular function together with serum gentamicin concentrations); avoid prolonged use; conditions characterised by muscular weakness; obesity (use ideal weight for height to calculate dose and monitor serum-gentamicin concentration closely)

Contra-indications: myasthenia gravis

Side Effects: vestibular and auditory damage, nephrotoxicity; rarely, hypomagnesaemia on prolonged therapy, antibiotic-associated colitis, stomatitis; nausea, vomiting, rash, blood disorders.

Dose: By intramuscular or by slow intravenous injection over at least 3 minutes or by intravenous infusion, 3–5 mg/kg daily (in divided doses every 8 hours); NEONATE up to 2 weeks, 3 mg/kg every 12 hours; CHILD 2 weeks–12 years, 2 mg/kg every 8 hours

Endocarditis **(**in combination with other antibacterial), ADULT 1 mg/kg every 8 hours

Endocarditis prophylaxis: Once daily dose regimen, by intravenous infusion, initially 5–7 mg/kg, then adjusted according to serum-gentamicin concentration

By intrathecal injection, seek specialist advice, 1 mg daily (increased if necessary to 5 mg daily)

Pregnancy: Second and third trimester***:*** Auditory or vestibular nerve damage; risk greatest with streptomycin; probably very small with gentamicin and tobramycin, but avoid unless essential.

- *Gentamicin Sulphate 80mg/2ml. IM, IV Inj*

- *Gentamicin Injection 80 mg/2 ml.*

IMIPENEM AND CILASTATIN

Indications: aerobic and anaerobic Gram-positive and Gram-negative infections; surgical prophylaxis; hospital-acquired septicaemia

Caution sensitivity to beta-lactam antibacterial (avoid if history of immediate hypersensitivity reaction), renal impairment; CNS disorders (e.g. epilepsy); pregnancy, breast-feeding.

Side Effects: nausea, vomiting, diarrhoea (antibiotic-associated colitis), taste disturbances, tooth or tongue discoloration, hearing loss; blood disorders, positive Coombs' test; allergic reactions (with rash, pruritus, urticaria, Stevens-Johnson syndrome, fever, anaphylactic reactions, rarely toxic epidermal necrolysis, exfoliative dermatitis); myoclonic activity, convulsions, confusion and mental disturbances; slight increases in liver enzymes and bilirubin, rarely hepatitis; increases in serum creatinine and blood urea; red coloration of urine in children; local reactions***:*** erythema, pain and induration, and thrombophlebitis

Dose: By deep intramuscular injection, mild to moderate infections, in terms of imipenem, 500–750 mg every 12 hours

By intravenous infusion, in terms of imipenem, 1–2 g daily (in 3–4 divided doses); less sensitive organisms, up to 50 mg/kg daily (max. 4 g daily) in 3–4 divided doses; CHILD 3 months and older, 60 mg/kg (up to max. of 2 g) daily in 4 divided doses; over 40 kg, adult dose

Surgical prophylaxis, by intravenous infusion, 1 g at induction repeated after 3 hours, supplemented in high risk (e.g. colorectal) surgery by doses of 500 mg 8 and 16 hours after induction

- *Imipenem & Cilastatin Sodium IV 500mg Each Inj.*
- *Tienam 500 mg Vials IM & IV*

MOXIFLOXACIN

Indications: sinusitis, community-acquired pneumonia, exacerbations of chronic bronchitis, mild to moderate pelvic inflammatory disease, or complicated skin and

soft-tissue infections which have failed to respond to other antibacterial or for patients who cannot be treated with other antibacterial

Cautions: should be used with caution in patients with a history of epilepsy or conditions that predispose to seizures, in G6PD deficiency, myasthenia gravis (risk of exacerbation), and in children or adolescents (arthropathy has developed in weight-bearing joints in young animals). Exposure to excessive sunlight should be avoided (discontinue if photosensitivity occurs).

Contra-indications: patients with risk factors for QT interval prolongation (e.g. electrolyte disturbances, acute myocardial infarction, heart failure with reduced left ventricular ejection fraction, bradycardia, congenital long QT syndrome. history of symptomatic arrhythmias

Hepatic impairment: manufacturer advises avoid in severe impairment

Side Effects: nausea, vomiting, diarrhoea (rarely antibiotic-associated colitis), headache, and dizziness. Less frequent side effects include dyspepsia, abdominal pain, anorexia, sleep disturbances, asthenia, confusion, anxiety, depression, hallucinations, tremor, blood disorders (including eosinophilia, leucopenia, thrombocytopenia), arthralgia, myalgia, rash (very rarely Stevens-Johnson syndrome and toxic epidermal necrolysis), disturbances in vision and taste.

Pregnancy: Quinolones should be avoided in pregnancy because they have been shown to cause arthropathy in animal studies

Breast-feeding: manufacturer advises avoid—present in milk in *animal* studies

Dose: By mouth, 400 mg once daily

By intravenous infusion over 60 minutes, community-acquired pneumonia, complicated skin and soft-tissue infections, 400 mg once daily

- *Avelox Intravenous infusion, (as hydrochloride) 1.6 mg/ml, 250-ml bottle (400 mg)*

NITROFURANTOIN

Indications: urinary-tract infections

Caution anaemia; diabetes mellitus; electrolyte imbalance; vitamin B and folate deficiency; pulmonary disease; hepatic impairment; monitor lung and liver

function on long-term therapy, especially in the elderly (discontinue if deterioration in lung function); susceptibility to peripheral neuropathy; false positive urinary glucose (if tested for reducing substances); urine may be coloured yellow or brown

Contra-indications: renal impairment; infants less than 3 months old, G6PD deficiency (including pregnancy***:*** at term, and breast-feeding***:*** of affected infants, and porphyria

Side Effects: anorexia, nausea, vomiting, and diarrhoea; acute and chronic pulmonary reactions (pulmonary fibrosis; possible association with lupus erythematosus-like syndrome); peripheral neuropathy; hypersensitivity reactions (including angioedema, anaphylaxis, sialadenitis, urticaria, rash and pruritus); rarely, cholestatic jaundice, hepatitis, exfoliative dermatitis, erythema multiforme, pancreatitis, arthralgia, blood disorders (including agranulocytosis, thrombocytopenia, and aplastic anaemia), benign intracranial hypertension, and transient alopecia

Dose: Acute uncomplicated infection, 50 mg every 6 hours with food for 7 days;

CHILD over 3 months, 3 mg/kg daily in 4 divided doses

Severe chronic recurrent infection, 100 mg every 6 hours with food for 7 days (dose reduced or discontinued if severe nausea)

Prophylaxis, 50–100 mg at night; CHILD over 3 months, 1 mg/kg at night

Pregnancy: Third trimester***:*** May produce neonatal haemolysis if used at term

- *Nitrofurantoin Tab 100 mg.*
- *Furadantin Tablets 100 mg*

NORFLOXACIN

Indications: broad spectrum bactericidal agent for upper and lower, complicated and uncomplicated acute and chronic urinary tract infections; acute bacterial gastro-enteritis caused by sensitive bacteria; gonococcal urethritis and/or cervicitis caused by both penicillinase and non-penicillinase producing Neisseria gonorrhoea; for the prophylaxis of sepsis in patients with profound neutropenia.

Caution history of convulsions; pregnancy; nursing mothers.
Contra-indications: hypersensitivity to the drug or any chemically related quinolone antibacterial.
Side Effects: gastro-intestinal, neuropsychiatry and skin reactions; rarely, anorexia, sleep disturbances, depression.
Dose: Urinary-tract infections, 400 mg twice daily for 7–10 days (for 3 days in uncomplicated lower urinary-tract infections)
Chronic relapsing urinary-tract infections, 400 mg twice daily for up to 12 weeks; may be reduced to 400 mg once daily if adequate suppression within first 4 weeks
Chronic prostatitis, 400 mg twice daily for 28 days

- *Norfloxacin 400 mg. Tablets*
- *Noroxin 400 mg Tablets*

PENICILLIN V

Indications: oral infections; tonsillitis, otitis media, erysipelas, cellulitis; rheumatic fever and pneumococcal infection prophylaxis
Cautions: history of allergy; false-positive urinary glucose (if tested for reducing substances); renal impairment
Contra-indications: penicillin hypersensitivity
Side Effects: hypersensitivity reactions including urticaria, fever, joint pains, rashes, angioedema, anaphylaxis, serum sickness-like reaction; *rarely* CNS toxicity including convulsions (especially with high doses or in severe renal impairment), interstitial nephritis, haemolytic anaemia, leucopenia, thrombocytopenia, and coagulation disorders; also reported diarrhoea (including antibiotic-associated colitis)
Dose: 500 mg every 6 hours increased up to 1 g every 6 hours in severe infections;
CHILD up to 1 year 62.5 mg every 6 hours, increased up to 12.5 mg/kg every 6 hours in severe infections; 1–5 years, 125 mg every 6 hours, increased up to 12.5 mg/kg every 6 hours in severe infections; 6–12 years, 250 mg every 6 hours, increased up to 12.5 mg/kg every 6 hours in severe infections

- *Penicillin V 250mg/5ml. Susp 100ml.*
- *Penicillin V. Tab 250 mg.*

PIPERACILLIN/ TAZOBACTAM

Indications: Lower respiratory-tract, urinary-tract, intra-abdominal and skin infections, and septicaemia, Complicated appendicitis; Infections in neutropenic patients

Caution history of allergy; false-positive urinary glucose (if tested for reducing substances); renal impairment; pregnancy; breast feeding.

Contra-indications: penicillin hypersensitivity

Side Effects: hypersensitivity reactions including urticaria, fever, joint pains, rashes, angioedema, anaphylaxis, serum sickness-like reaction; *rarely* CNS toxicity including convulsions (especially with high doses or in severe renal impairment), interstitial nephritis, haemolytic anaemia, leucopenia, thrombocytopenia, and coagulation disorders; diarrhoea (including antibiotic-associated colitis) nausea, vomiting, diarrhoea; less commonly stomatitis, dyspepsia, constipation, jaundice, hypotension, headache, insomnia, and injection-site reactions; *rarely* abdominal pain, hepatitis, oedema, fatigue, and eosinophilia; very rarely hypoglycaemia, hypokalaemia, pancytopenia, Stevens-Johnson syndrome, and toxic epidermal necrolysis

Dose: Lower respiratory-tract, urinary-tract, intra-abdominal and skin infections, and septicaemia***:***

ADULT and CHILD over 12 years, by intravenous injection over 3–5 minutes or by intravenous infusion, 2.25–4.5 g every 6–8 hours, usually 4.5 g every 8 hours

Complicated appendicitis, by intravenous injection over 3–5 minutes or by intravenous infusion, CHILD 2–12 years, 112.5 mg/kg every 8 hours (max. 4.5 g every 8 hours) for 5–14 days;

CHILD under 2 years, not recommended

Infections in neutropenic patients (in combination with an aminoglycoside), by intravenous injection over 3–5 minutes or by intravenous infusion, ADULT and CHILD over 50 kg, 4.5 g every 6 hours; CHILD less than 50 kg, 90 mg/kg every 6 hours

- *Piperacillin/Tazobactam Inj. 4.5g Vail Inj*
- *Tazocin Vials 4.5 g (4 g/500 mg).*

PROCAINE PENICILLIN

Indications: throat infections, otitis media, endocarditis, meningococcal disease, pneumonia, cellulitis, anthrax; prophylaxis in limb amputation; early or late latent syphilis.
Cautions: history of allergy; false-positive urinary glucose (if tested for reducing substances); renal impairment
Contra-indications: penicillin hypersensitivity
Side Effects: hypersensitivity reactions including urticaria, fever, joint pains, rashes, angioedema, anaphylaxis, serum sickness-like reaction; *rarely* CNS toxicity including convulsions (especially with high doses or in severe renal impairment), interstitial nephritis, haemolytic anaemia, leucopenia, thrombocytopenia, and coagulation disorders; also reported diarrhoea (including antibiotic-associated colitis
Dose: by IM injection, child over 25 kg and adults, 400, 000 units (300 mg procaine penicillin and 60 mg benzyl penicillin sodium) 24-hourly or 12-hourly.
Child under 25 kg, according to body weight, Acute uncomplicated gonorrhoea, 2.4-4.8 g as a single dose.
Syphilis 1.2 g daily for 10-14 days.

- *Procaine Penicillin 400, 000 Units/2ml. Inj.*

SPIRAMYCIN

Indications: Treatment of infections of the respiratory tract buccal cavity skin and soft tissues due to susceptible organisms. N. gonorrhoeae***:*** as an alternate choice of treatment for gonorrhea in patients allergic to the penicillin. (Before treatment of gonorrhea, the possibility of concomitant infection due to T. pallidum should be excluded
Cautions: in patients with a predisposition to QT interval prolongation (including electrolyte disturbances and concomitant use of drugs that prolong the QT interval). Macrolides may aggravate myasthenia gravis.
Contra-indications: Hypersensitivity to spiramycin, other macrolides (eg, erythromycin) or any component of the formulation.
Pregnancy: Implications Crosses placenta. Specific safety information is not available. However, spiramycin

has been used to treat Toxoplasma gondii to prevent transmission from mother to fetus. Lactation Enters breast milk/compatible (based on other macrolides).
Breast-feeding: Considerations Excreted in breast milk in bacteriostatic concentrations. Dietary Considerations May be taken without regard to meals. Food may improve gastrointestinal tolerance.
Side Effects: Dermatologic***:*** Angioedema (rare), pruritus, rash, urticaria. Gastrointestinal***:*** Diarrhea, nausea, pseudomembranous colitis (rare), vomiting. Hepatic***:*** Transaminases increased. Neuromuscular & skeletal***:*** Paresthesia (rare). Miscellaneous***:*** Anaphylactic shock (rare).
Dose: Oral, 1 to 2 grams two times a day, or 500 mg to 1 gram three times a day. For severe infections, the dose may be increased to 2 to 2.5 grams two times a day

- *Spiramycin 1g tablet.*

TETRACYCLINE HCL

Indications: acne vulgaris, rosacea, exacerbations of chronic bronchitis; infections due to brucella, chlamydia, mycoplasma and rickettsia
Cautions: breast-feeding; rarely causes photosensitivity. Avoid administration in hepatic impairment
Contra-indications: renal failure, pregnancy, children under 12 years of age.
Side Effects: nausea, vomiting, diarrhoea; super-infection with resistant organisms; rarely allergic reactions.
Dose: 250 mg every 6 hours, increased in severe infections to 500 mg every 6–8 hours
For acne, 250 mg 3 times daily for 1-4 weeks and then reduced to twice daily until improvement occurs.
Non-gonococcal urethritis, 500 mg every 6 hours for 7–14 days (21 days if failure or relapse after first course)
Pregnancy: First trimester***:*** Effects on skeletal development in *animal* studies
Second and third trimester***:*** Dental discoloration; maternal hepatotoxicity with large parenteral doses

- *Tetracycline HCl. Cap 250 mg*
- *Achromycin Capsules 250 mg*

TIGECYCLINE

is a glycylcycline antibacterial structurally related to the tetracyclines; side effects similar to those of the tetracyclines can potentially occur. Tigecycline is active against Gram-positive and Gram-negative bacteria, including tetracycline-resistant organisms, and some anaerobes. It is also active against meticillin-resistant Staphylococcus aureus and vancomycin-resistant enterococci, but Pseudomonas aeruginosa and many strains of Proteus spp are resistant to tigecycline. Tigecycline should be reserved for the treatment of complicated skin and soft-tissue infections and complicated abdominal infections caused by multiple-antibacterial resistant organisms when other antibacterial cannot be used; it is not recommended for the treatment of foot infections in patients with diabetes.

Indications: Tigecycline is active against Gram-positive and Gram-negative bacteria, including tetracycline-resistant organisms, and some anaerobes. It is also active against meticillin-resistant Staphylococcus aureus and vancomycin-resistant enterococci, but Pseudomonas aeruginosa and many strains of Proteus spp are resistant to tigecycline. Tigecycline should be reserved for the treatment of complicated skin and soft-tissue infections and complicated abdominal infections caused by multiple-antibacterial resistant organisms when other antibacterial cannot be used; it is not recommended for the treatment of foot infections in patients with diabetes

Cautions: cholestasis

Contra-indications: hypersensitivity to tetracyclines

Hepatic impairment: initially 100 mg then 25 mg every 12 hours in severe impairment

Breast-feeding: manufacturer advises caution (present in milk in animal studies).

Pregnancy: should not be given to pregnant women

Side Effects: nausea, vomiting, abdominal pain, dyspepsia, diarrhoea, anorexia, bilirubinaemia, dizziness, headache, hypoglycaemia, prolonged prothrombin time, prolonged activated partial thromboplastin time, rash, pruritus, and injection-site reactions; less commonly pancreatitis, cholestatic jaundice, and hypoproteinaemia; also reported, antibiotic-associated colitis, hepatic failure, thrombocytopenia, Stevens-Johnson syndrome.

Dose: By intravenous infusion, ADULT over 18 years, initially 100 mg, then 50 mg every 12 hours for 5–14 days

- *Tygacil Intravenous infusion, powder for reconstitution, 50-mg vial.*

TOBRAMYCIN.

Indications: Chronic pulmonary Pseudomonas aeruginosa infection in patients with cystic fibrosis
Cautions: Other inhaled drugs should be administered before tobramycin. Measure lung function before and after initial dose of tobramycin and monitor for bronchospasm; if bronchospasm occurs in a patient not using a bronchodilator, repeat test using bronchodilator. Monitor renal function before treatment and then annually. Severe haemoptysis—risk of further haemorrhage
Contra-indications: myasthenia gravis
Side Effects: on inhalation, cough (more frequent by inhalation of powder), bronchospasm, dysphonia, taste disturbances, pharyngitis, mouth ulcers, salivary hypersecretion, laryngitis, haemoptysis, epistaxis
Pregnancy: Second and third trimester***:*** Auditory or vestibular nerve damage.
Dose: by inhalation of nebulised solution, adult and child over 6 years, 300 mg every 12 hours for 28 days, subsequent courses repeated after 28-day interval without tobramycin nebuliser solution

- *Tobi Nebuliser solution, 60 mg/ml.*

VANCOMYCIN

Indications: prophylaxis and treatment of endocarditis and other serious infections caused by Gram-positive cocci; treatment of peritonitis associated with peritoneal dialysis added to dialysis fluid
Cautions: avoid rapid infusion (risk of anaphylactoid reactions); rotate infusion sites; renal impairment; elderly; avoid if history of deafness; all patients require plasma-vancomycin measurement (after 3 or 4 doses if renal function normal, earlier if renal impairment), blood counts, urinalysis, and renal function tests; monitor

auditory function in elderly or if renal impairment; pregnancy and breast-feeding.
Side Effects: nephrotoxicity including renal failure and interstitial nephritis; ototoxicity (discontinue if tinnitus occurs); blood disorders including neutropenia (usually after 1 week or cumulative dose of 25 g), rarely agranulocytosis and thrombocytopenia; nausea; chills, fever; eosinophilia, anaphylaxis, rashes (including exfoliative dermatitis, Stevens-Johnson syndrome, toxic epidermal necrolysis, and vasculitis); phlebitis (irritant to tissue); on rapid infusion, severe hypotension (including shock and cardiac arrest), wheezing, dyspnea, urticaria, pruritus, flushing of the upper body (red man syndrome), pain and muscle spasm of back and chest
Dose: By intravenous infusion, 1 g every 12 hours; ELDERLY over 65 years, 500 mg every 12 hours or 1 g once daily; CHILD over 1 month, 15 mg/kg every 8 hours (max. 2 g daily)
Endocarditis prophylaxis
Pregnancy: Use only if potential benefit outweighs risk—plasma-vancomycin concentration monitoring essential to reduce risk of fetal toxicity

- *Vancomycin Ing 500mg/Vial I.V*
- *Vancocin Injection 500 mg Vial*

ANTIMYCOBACTRIAL DRUGS

CAPREOMYCIN SULFATE

Indications: In combination with other drugs, tuberculosis resistant to first-line drugs
***Cautions*:** auditory impairment; monitor renal, hepatic, auditory, and vestibular function and electrolytes.
Contra-indications: Hypersensitivity to capreomycin or any component of the formulation.
Hepatic impairment use with caution
Renal impairment reduce dose, nephrotoxic; ototoxic
Pregnancy manufacturer advises use only if potential benefit outweighs risk (teratogenic in animal studies).
Breast-feeding manufacturer advises caution (no information available).
***Side Effects*:** hypersensitivity reactions including urticaria and rashes. leukocytosis or leucopenia, rarely thrombocytopenia. changes in liver function tests

nephrotoxicity, electrolyte disturbances hearing loss with tinnitus and vertigo neuromuscular block after large doses. pain and induration at injection site
Dose*:* By deep intramuscular injection**:** 1 g daily (not more than 20 mg/kg) for 2–4 months, then 1 g 2–3 times each week.

- *Capreomycin Injection, powder for reconstitution, 1 million units (= capreomycin approx. 1 g).*

DAPSONE

Indications: leprosy, dermatitis herpetiformis
Cautions: cardiac or pulmonary disease; breast-feeding**,** anaemia, G6 PD Deficiency, porphyria.
Contra-indications: pregnancy; porphyria
Side Effects: dose-related and uncommon at doses used for leprosy, haemolysis, methaemoglobinaemia, neuropathy, allergic dermatitis (rarely including toxic epidermal necrolysis and Stevens-Johnson syndrome), anorexia, nausea, vomiting, tachycardia, headache, insomnia, psychosis, hepatitis, agranulocytosis; dapsone syndrome (rash with fever and eosinophilia)—discontinue immediately (may progress to exfoliative dermatitis, hepatitis, hypoalbuminaemia, psychosis and death
Dose: leprosy, 1-2 mg/kg daily.
Multibacillary leprosy, as part of a three - drug regimen with rifampicin and clofazimine, 100 mg daily, self administered for at least 2 years.
Paucibacillary leprosy, as part of a two - drug regimen with rifampicin, 100 mg daily, self administered for at least 6 months
Pregnancy: Third trimester*:* Neonatal haemolysis and methaemoglobinaemia reported
Breast feeding: Haemolytic anaemia; although significant amount in milk, risk to infant very small unless infant is G6PD deficient

- *Dapson 100 mg Tab.*
- *Avlosulphon 100 mg Tablets*

ETHAMBUTOL HCL

Indications: tuberculosis, in combination with other drugs

Cautions: ***renal impairment*** and if creatinine clearance less than 30 ml/minute, monitor plasma-ethambutol concentration in elderly; pregnancy; test visual acuity before treatment and warn patients to report visual changes.
Contra-indications: optic neuritis, poor vision
Side Effects: optic neuritis, red/green colour blindness, peripheral neuritis, rarely rash, pruritus, urticaria, thrombocytopenia
Dose: adult and children over 6 years, 15 mg/kg daily.

- *Ethambutol HCl Tab 400 mg*
- *Myambutol Tablets 400 mg*

ISONIAZID

Indications: tuberculosis, in combination with other drugs; prophylaxis
Cautions: hepatic impairment; renal impairment; slow acetylator status (increased risk of side effects); epilepsy; history of psychosis; alcohol dependence, malnutrition, diabetes mellitus, HIV infection (risk of peripheral neuritis); pregnancy and breast-feeding; porphyria
Contra-indications: drug-induced liver disease
Side Effects: nausea, vomiting, constipation, dry mouth; peripheral neuritis with high doses (pyridoxine prophylaxis), optic neuritis, convulsions, psychotic episodes, vertigo; hypersensitivity reactions including fever, erythema multiforme, purpura; blood disorders including agranulocytosis, haemolytic anaemia, aplastic anaemia; hepatitis (especially over age of 35 years); systemic lupus erythematosus-like syndrome, pellagra, hyperreflexia, difficulty with micturition, hyperglycaemia, and gynaecomastia reported
Dose: For 2 months initial and 4 months continuous phases**:** by mouth, pulmonary tuberculosis, 300mg daily on an empty stomach. Child, 5 mg/kg daily tuberculous meningitis, 10 mg/kg daily.

- *Isoniazid 100mg, 300mg Tab (INH)*

PYRAZINAMIDE

Indications: tuberculosis in combination with other drugs.

Cautions: impaired renal function, diabetes, gout, liver-function tests required, pregnancy
Contra-indications: Porphyria
Side Effects: hepatomegaly, hepatotoxicity including fever, anorexia, jaundice, fulminating liver failure; nausea, vomiting, arthralgia, sideroblastic anaemia, urticaria.
Dose: by mouth as a single dose, 35 mg/kg daily; max. daily dose, 3g-Alternative dosing schedule, 50 mg/kg three times weekly or 75mg/kg twice weekly.

- *Pyrazinamide 0.5g Tab.*

RIFABUTINE

Indications: Prophylaxis of Mycobacterium avium complex infections in immunosuppressed patients with low CD4 count. Treatment of non-tuberculous mycobacterial disease, in combination with other drugs. Treatment of pulmonary tuberculosis, in combination with other drugs. CHILD not recommended
Cautions: acute porphyria
Contra-indications: rifamycin hypersensitivity
Hepatic impairment : reduce dose in severe impairment
Renal impairment : use half normal dose if eGFR less than 30 ml/minute/1.73 m^2
Pregnancy : manufacturer advises avoid since no information available
Breast-feeding: manufacturer advises avoid since no information available.
Side Effects: nausea, pyrexia, blood disorders (including leucopenia, anaemia, thrombocytopenia, and rarely haemolysis), myalgia, rash. less commonly vomiting, raised liver enzymes, jaundice, arthralgia, corneal deposits, uveitis especially following high doses or concomitant use with drugs that increase plasma concentration, hypersensitivity reactions (including eosinophilia, bronchospasm), skin, urine, saliva and other body secretions coloured orange-red; also reported hepatitis, influenza-like symptoms, chest pain, dyspnea
Dose: Prophylaxis of Mycobacterium avium complex infections in immunosuppressed patients with low CD4 count: 300 mg daily as a single dose

Treatment of non-tuberculous mycobacterial disease (in combination with other drugs): 450–600 mg daily as a single dose for up to 6 months after cultures negative
Treatment of pulmonary tuberculosis (in combination with other drugs): 150–450 mg daily as a single dose for at least 6 months.

- *Mycobutin Capsules 150 mg.*

RIFAMPICIN

Indications: tuberculosis, in combination with other drugs, usually isoniazid and ethambutol; leprosy.
Cautions: reduce dose in hepatic impairment; alcoholism; pregnancy. Discolors soft contact lenses.
Contra-indications: jaundice
Side Effects: gastro-intestinal symptoms, respiratory symptoms including shortness of breath; acute renal failure; thrombocytopenic purpura; collapse and shock; orange-red discoloration of body secretions.
Dose: all doses taken 30 minutes before a meal or 2 hours after a meal. Tuberculosis, 450-600 mg (about 10 mg/kg) daily preferably before breakfast.
Child, up to 20 mg/kg daily to a max. of 600 mg. Dose in hepatic impairment should not exceed 8 mg/kg daily.
Serious staphylococcal infections, 600-1200 mg in 2-4 divided doses in combination with another antibiotic.
Prophylaxis of meningococcal meningitis, 600 mg twice daily for 2 days.
Child 3 months-1 year, 5 mg/kg twice daily for 2 days

- *Rifampicin Cap 150 mg*
- *Rifampicin Cap 300 mg*
- *Rifadin Capsules 150 mg, 300 mg*
- *Rifadin Syrup 100 mg/5 ml*
- *Rimactazid Tablets 300 mg*
- *Rifampicin 300 mg & Isoniazid 150 mg/Tablet*

RIFAXIMIN

Indications: Traveler's Diarrhea. Hepatic Encephalopathy. Irritable Bowel Syndrome (Off-label)
Cautions: Not effective in diarrhea complicated by fever, hematochezia, or diarrhea due to pathogens other than Escherichia coli Not effective against traveler's diarrhea due to Campylobacter jejuni Clostridium difficile-

associated diarrhea has been reported Efficacy against traveler's diarrhea due to Shigella spp and Salmonella spp not proven Discontinue if symptoms worsen or persist >24-48 hr Possibility of pseudomembranous colitis Monitor patients with severe hepatic impairment for increased systemic exposure Co administration with P-gp inhibitors substantially increases systemic exposure to rifaximin; co administration of cyclosporine with rifaximin resulted in 83-fold and 124-fold increases in rifaximin mean Cmax and AUC in healthy subjects
Hepatic impairment: manufacturer advises caution when used for hepatic encephalopathy in patients with severe hepatic impairment
Pregnancy: manufacturer advises avoid—toxicity in animal studies
Breast-feeding: unlikely to be present in milk in significant amounts, but manufacturer advises avoid
Contra-indications: Hypersensitivity to rifamycin antibiotics
Side Effects: nausea, vomiting, abdominal pain, flatulence, diarrhoea, dyspnea, headache, depression, dizziness, muscle spasm, rash, pruritus; less commonly anorexia, taste disturbances, dry mouth, peripheral oedema, sleep disturbances, anxiety, memory impairment, convulsions, hypoaesthesia, paraesthesia, antibiotic-associated colitis, influenza-like symptoms, dysuria, polyuria, glycosuria, polymenorrhoea, blood disorders, hyperkalaemia; rarely blood pressure changes, constipation; also reported syncope
Dose: For Adult***:*** Traveler's Diarrhea***:*** 200 mg PO q8hr for 3 days Hepatic Encephalopathy Maintenance of remission***:*** Table Of Content 550 mg PO q12hr Irritable Bowel Syndrome (Offlabel) 550 mg PO q8hr for 14 days Dosing Considerations***:*** 2 trials (n >600 in each) in patients with IBS without constipation showed rifaximin to be more effective than placebo in providing adequate symptom relief Can take with or without food For pediatric***:*** <12 years***:*** Safety and efficacy not established ≥12 years***:*** 200 mg PO q8hr for 3 days, with or without food.

- *Xifaxanta Tablets 200 mg,*

STREPTOMYCIN

Indications: tuberculosis in combination with other drugs; adjunct to doxycycline in brucellosis
Cautions: ***breast-feeding***, increase dose interval in renal impairment.
Contra-indications: pregnancy, myasthenia gravis
Side Effects: vestibular damage, reversible nephrotoxicity. rarely, hypomagnesaemia on prolonged therapy, antibiotic-associated colitis, stomatitis; also reported, nausea, vomiting, rash, blood disorders
Pregnancy: Second and third trimester***:*** Auditory or vestibular nerve damage
Dose: by IM injection, 1 g daily.
In patients over 40 years, under 50 kg or those with renal impairment, reduce dose.
Note: One-hour (peak) concentration should be 15–40 mg/litre; pre-dose ('trough') concentration should be less than 5 mg/litre (less than 1 mg/litre in renal impairment or in those over 50 years)

- *Streptomycin Inj 1g.*.

ANTIFUNGAL DRUGS

ECHINOCANDIN ANTIFUNGALS

The echinocandin antifungals include anidulafungin, They are only active against Aspergillus spp. and Candida spp; however, anidulafungin and micafungin are not used for the treatment of aspergillosis. Echinocandins are not effective against fungal infections of the CNS

ANIDULAFUNGIN

As Echinocandin antifungal
Indications: Treatment of candidemia and other forms of Candida infections (including those of intra-abdominal, peritoneal, and esophageal locus).
Cautions**:** Candidal infections**:** Safety and efficacy have not been established in other Candida infections (eg, endocarditis, osteomyelitis, meningitis.
Contra-indications: Hypersensitivity to anidulafungin, other echinocandins, or any component of the formulation.

***Renal Impairment*:** No dosage adjustment necessary, including dialysis patients.
Hepatic Impairment No dosage adjustment necessary
***Side Effects*:** Most common**:** Cardiovascular: Hypotension hypertension, peripheral edema. Central nervous system: Fever, insomnia. Endocrine & metabolic: Hypokalemia, hypomagnesemia. Gastrointestinal: Nausea, diarrhea, vomiting. Genitourinary: Urinary tract infection. Hepatic: Alkaline phosphatase increased. Respiratory: Dyspnea. Miscellaneous: Bacteremia. Less common**:** Cardiovascular: Deep vein thrombosis, chest pain. Central nervous system: Confusion, headache, depression. Dermatologic: Decubitus ulcer. Endocrine & metabolic: Hypoglycemia, dehydration, hyperglycemia, hyperkalemia. Gastrointestinal: Constipation, dyspepsia, abdominal pain, oral candidiasis. Hematologic: Anemia, thrombocythemia, leukocytosis. Hepatic: Transaminases increased. Neuromuscular & skeletal: Back pain. Renal: Creatinine increased. Respiratory: Pleural effusion, cough, pneumonia, respiratory distress. Miscellaneous: Sepsis. Rare**: (**Limited to important or life-threatening): Amylase increased, anaphylactic shock, anaphylaxis, angioedema, atrial fibrillation, bundle branch block (right), cholestasis, clostridial infection, coagulopathy, ECG abnormality (including QT prolongation), hepatic dysfunction, hepatic necrosis, hepatitis, infusion-related reaction, prothrombin time prolonged, seizure, sinus arrhythmia, thrombocytopenia, thrombophlebitis, ventricular extrasystoles, vision blurred
Dose: Adult and Geriatric: venous route: Candidemia, intra-abdominal or peritoneal candidiasis: Intravenous route: Initial dose: 200 mg on day 1 subsequent dosing: 100 mg daily treatment should continue until 14 days after last positive culture. Esophageal candidiasis: Initial dose: 100 mg on day 1. subsequent dosing: 50 mg daily. treatment should continue for a minimum of 14 days and for at least 7 days after symptom resolution.
Note: Pediatric dose: Safety and efficacy not established limited data suggest off-label dose of 3 mg/m²/dose IV loading dose, then 1.5 mg/m²/dose IV once daily.

- *Ecalta Intravenous infusion, powder for reconstitution, 100-mg*

AMPHOTERICIN

Indications: candidiasis, systemic fungal infectins
Cautions: when given parenterally, toxicity common (close supervision necessary and test dose required); renal impairment; hepatic and renal function tests, blood counts, and plasma electrolyte (including plasma-potassium and magnesium concentration) monitoring required; corticosteroids (avoid except to control reactions); pregnancy, breast-feeding; avoid rapid infusion (risk of arrhythmias, Anaphylaxis)
Side Effects: anorexia, nausea and vomiting, diarrhoea, epigastric pain; febrile reactions, headache, muscle and joint pain; anaemia; disturbances in renal function (including hypokalaemia and hypomagnesaemia) and renal toxicity; also cardiovascular toxicity (including arrhythmias, blood pressure changes), blood disorders, neurological disorders (including hearing loss, diplopia, convulsions, peripheral neuropathy, encephalopathy), abnormal liver function (discontinue treatment), rash, anaphylactoid reactions; pain and thrombophlebitis at injection site
Dose: By intravenous infusion, systemic fungal infections, initial test dose of 1 mg over 20–30 minutes then 250 mcg/kg daily, gradually increased over 2–4 days, if tolerated, to 1 mg/kg daily; max. (severe infection) 1.5 mg/kg daily or on alternate days

- *Amphotericin 50mg./Vial I.V Infusion.*
- *Fungizone Injection 50 mg/ Vial.*

CASPOFUNGIN

***Indications*:** invasive aspergillosis). invasive candidiasis empirical treatment of systemic fungal infections in patients with neutropenia.
Contra-indications: Hypersensitivity
Hepatic impairment: 70 mg on first day then 35 mg once daily in moderate impairment; no information available for severe impairment
***Pregnancy*:** manufacturer advises avoid unless essential—toxicity in animal studies
***Breast-feeding*:** present in milk in animal studies (manufacturer advises avoid)

***Side Effects*:** nausea, diarrhoea, vomiting; dyspnea; headache; hypokalemia; arthralgia; rash, pruritus, sweating, injection-site reactions. less commonly: abdominal pain, dyspepsia, dry mouth, dysphagia, taste disturbances, anorexia, constipation, flatulence, cholestasis, hepatic dysfunction, ascites, palpitation, arrhythmia, chest pain, heart failure, thrombophlebitis, flushing, hypotension, hypertension, bronchospasm, cough, dizziness, fatigue, paraesthesia, hypoaesthesia, sleep disturbances, tremor, anxiety, disorientation, hyper glycaemia, renal failure, hypomagnesaemia, hypocalcaemia, metabolic acidosis, anemia, thrombocytopenia, leucopenia, myalgia, muscular weakness, blurred vision, and erythema multiform; also reported, adult respiratory distress syndrome and anaphylaxis.

Dose and Maintenance: By intravenous infusion: 70 mg on first day then 50 mg once daily (70 mg once daily if body-weight over 80 kg).

- *Cancidas Intravenous infusion, powder for reconstitution 50-mg vial*

FLUCONAZOLE

Indications: fungal infections.

Cautions: renal impairment, pregnancy and breast-feeding; concomitant use with hepatotoxic drugs, monitor liver function with high doses or extended courses—discontinue if signs or symptoms of hepatic disease (risk of hepatic necrosis); susceptibility to QT interval prolongation

Side Effects: nausea, abdominal discomfort, diarrhoea, flatulence, headache, rash (discontinue treatment or monitor closely if infection invasive or systemic); less frequently dyspepsia, vomiting, taste disturbance, hepatic disorders, hypersensitivity reactions, anaphylaxis, dizziness, seizures, alopecia, pruritus, toxic epidermal necrolysis, Stevens-Johnson syndrome (severe cutaneous reactions more likely in AIDS patients), hyperlipidaemia, leucopenia, thrombocytopenia, and hypokalaemia.

Dose: Vaginal candidiasis and candidal balanitis, by mouth, a single dose of 150 mg

Mucosal candidiasis (except genital), by mouth, 50 mg daily (100 mg daily in unusually difficult infections) given for 7–14 days in oropharyngeal candidiasis (max. 14 days except in severely immunocompromised patients); for 14 days in atrophic oral candidiasis associated with dentures; for 14–30 days in other mucosal infections (e.g. oesophagitis, candiduria, non-invasive bronchopulmonary infections);
CHILD by mouth or by intravenous infusion, 3–6 mg/kg on first day then 3 mg/kg daily (every 72 hours) NEONATE up to 2 weeks old, every 48 hours in neonate 2–4 weeks old)
Tinea pedis, corporis, cruris, pityriasis versicolor, and dermal candidiasis, by mouth, 50 mg daily for 2–4 weeks (for up to 6 weeks in tinea pedis); max. duration of treatment 6 weeks
Invasive candidal infections (including candidaemia and disseminated candidiasis) and cryptococcal infections (including meningitis), by mouth or intravenous infusion, 400 mg on first day then 200–400 mg daily; max. 800 mg daily in severe infections; treatment continued according to response (at least 8 weeks for cryptococcal meningitis); CHILD 6–12 mg/kg daily (every 72 hours in NEONATE up to 2 weeks old, every 48 hours in NEONATE 2–4 weeks old); max. 400 mg daily
Prevention of relapse of cryptococcal meningitis in AIDS patients after completion of primary therapy, by mouth, 200 mg daily or by intravenous infusion, 100–200 mg daily
Prevention of fungal infections in immunocompromised patients, by mouth or by intravenous infusion, 50–400 mg daily adjusted according to risk; 400 mg daily if high risk of systemic infections e.g. following bone-marrow transplantation; commence treatment before anticipated onset of neutropenia and continue for 7 days after neutrophil count in desirable range; CHILD according to extent and duration of neutropenia, 3–12 mg/kg daily (every 72 hours in NEONATE up to 2 weeks old, every 48 hours in NEONATE 2–4 weeks old); max. 400 mg daily

- *Fluconazole, Caps.50mg, 150mg*
- *Diflucan Capsules 50 mg, 150 mg*
- *Fluconazole 200mg IV Inj*

GRISEOFULVIN

Indications: dermatophyte infections of the skin, scalp, hair and nails where topical therapy has failed or is inappropriate

Contra-indications: severe liver disease; systemic lupus erythematosus (risk of exacerbation); porphyria; pregnancy (avoid pregnancy during and for 1 month after treatment; men should not father children within 6 months of treatment); breast-feeding

Side Effects: nausea, vomiting, diarrhoea; headache; less frequently hepatotoxicity, dizziness, confusion, fatigue, sleep disturbances, impaired co-ordination, peripheral neuropathy, leucopenia, systemic lupus erythematosus, rash (including rarely erythema multiforme, toxic epidermal necrolysis), and photosensitivity

Dose: Dermatophyte infections, 500 mg once daily or in divided doses; in severe infection dose may be doubled, reducing when response occurs; CHILD under 50 kg, 10 mg/kg once daily or in divided doses

Tinea capitis caused by Trichophyton tonsurans, 1 g once daily or in divided doses; CHILD under 50 kg, 15–20 mg/kg once daily or in divided doses

- *Griseofulvin Tab 500mg*
- *Fulcin Tablets 500 mg*

ITRACONAZOLE

Indications: oropharyngeal candidiasis, Vulvovaginal candidiasis, Recurrent Vulvovaginal Candidiasis. Pityriasis versicolor. Tinea corporis and tinea cruris. Tinea pedis and tinea manuum. Onychomycosis. Aspergillosis. Histoplasmosis. Systemic candidiasis and cryptococcosis including cryptococcal meningitis where other antifungal drugs inappropriate or ineffective. cryptococcal meningitis, Maintenance in HIV-infected patients to prevent relapse of underlying fungal infection and Prophylaxis in neutropenia when standard therapy inappropriate. Prophylaxis in patients with haematological malignancy or undergoing bone-marrow transplant. Systemic aspergillosis. Candidiasis and cryptococcosis including cryptococcal meningitis where other antifungal drugs inappropriate or ineffective. Histoplasmosis.

Cautions: Absorption reduced in HIV-infection and neutropenia (monitor plasma- itraconazole concentration and increase dose if necessary); susceptibility to congestive heart failure
Contra-indications: Acute porphyria
Hepatotoxicity Potentially life-threatening hepatotoxicity reported very rarely—discontinue if signs of hepatitis develop. Avoid or use with caution if history of hepatotoxicity with other drugs or in active liver disease. Monitor liver function if treatment continues for longer than one month, if receiving other hepatotoxic drugs, if history of hepatotoxicity with other drugs, or in hepatic impairment.
Hepatic impairment: use only if potential benefit outweighs risk of hepatotoxicity (dose reduction may be necessary)
Renal impairment: risk of congestive heart failure; bioavailability of oral formulations possibly reduced; use intravenous infusion with caution if eGFR 30–80 ml/minute/1.73 m^2; avoid intravenous infusion if eGFR less than 30 ml/minute/1.73m^2
Pregnancy: manufacturer advises use only in life-threatening situations (toxicity at high doses in *animal* studies); ensure effective contraception during treatment and until the next menstrual period following end of treatment
Breast-feeding: small amounts present in milk—may accumulate; manufacturer advises avoid
Side Effects: Nausea, vomiting, taste disturbances, abdominal pain, diarrhoea, hepatitis (see Hepatotoxicity above), dyspnea, headache, hypokalemia, rash. *less commonly* dyspepsia, flatulence, constipation, oedema, dizziness, peripheral neuropathy (discontinue treatment), menstrual disorder, myalgia; *rarely* pancreatitis, heart failure (see ***Cautions*** above), hypertriglyceridemia, erectile dysfunction, urinary frequency, leucopenia, visual disturbances, tinnitus, deafness, alopecia, photosensitivity, toxic epidermal necrolysis, Stevens-Johnson syndrome; also reported, blood pressure changes, confusion, drowsiness, tremor, thrombocytopenia, renal impairment, arthralgia. With intravenous injection hyperglycemia

Dose: By mouth: oropharyngeal candidiasis. Vulvovaginal candidiasis: 200 mg twice daily for 1 day Pityriasis versicolor, 200 mg once daily for 7 days Tinea corporis and tinea cruris, *either* 100 mg once daily for 15 days *or* 200 mg once daily for 7 days Tinea pedis and tinea manuum, *either* 100 mg once daily for 30 days *or* 200 mg twice daily for 7 days Onychomycosis, *either* 200 mg once daily for 3 months *or* course ('pulse') of 200 mg twice daily for 7 days, subsequent courses repeated after 21-day interval; fingernails 2 courses, toenails 3 courses Aspergillosis, 200 mg twice daily Histoplasmosis, 200 mg 3 times daily for 3 days, and then 200 mg once or twice daily Systemic candidiasis and cryptococcosis including cryptococcal meningitis where other antifungal drugs inappropriate or ineffective, 200 mg once daily (candidiasis 100–200 mg once daily) increased in invasive or disseminated disease and in cryptococcal meningitis to 200 mg twice daily Maintenance in HIV-infected patients to prevent relapse of underlying fungal infection and prophylaxis in neutropenia when standard therapy inappropriate, 200 mg once daily, increased to 200 mg twice daily if low plasma-itraconazole concentration Prophylaxis in patients with haematological malignancy or undergoing bone-marrow transplant, oral liquid below By intravenous infusion, systemic aspergillosis, candidiasis and cryptococcosis including cryptococcal meningitis where other antifungal drugs inappropriate or ineffective, histoplasmosis, 200 mg every 12 hours for 2 days, then 200 mg once daily for max. 12 days

- *Sporanox 100mg Cap*
- *Sporanox syrup 100 mg*

KETOCONAZOLE

Indications: skin, hair, and mucosal mycoses that cannot be treated with other antifungals (including dermatophytoses, pityrosporum folliculitis, cutaneous candidiasis, chronic mucocutaneous candidiasis, oropharyngeal and oesophageal candidiasis, chronic recurrent vaginal candidiasis); systemic mycoses that cannot be treated with other antifungals (including histoplasmosis, blastomycosis, coccidioidomycosis, paracoccidiodomycosis

Cautions: predisposition to adrenocortical insufficiency; avoid in porphyria
Potentially life-threatening hepatotoxicity very rarely; risk of hepatotoxicity greater if given for longer than 14 days. Monitor liver function before treatment, then on weeks 2 and 4 of treatment, then every month; in active liver disease; if history of hepatotoxicity with other drugs.
Contra-indications: hepatic impairment; breast-feeding
Side Effects: nausea, vomiting, abdominal pain; pruritus; less commonly diarrhoea, headache, dizziness, drowsiness, and rash; very rarely fatal liver damage, dyspepsia, raised intracranial pressure, adrenocortical insufficiency, erectile dysfunction, menstrual disorders, oligospermia, gynaecomastia, thrombocytopenia, photophobia, and alopecia
Dose: 200 mg once daily, increased if response inadequate to 400 mg once daily; continued until symptoms have cleared and cultures negative (usually for 4 weeks in dermatophytoses, 2–3 weeks for oral and cutaneous candidiasis, 1–2 months for hair infections); CHILD body-weight 15–30 kg, 100 mg once daily; body-weight over 30 kg, adult dose
Chronic, recurrent vaginal candidiasis, 400 mg once daily for 5 days

- *Ketoconazol 200mg Tab*
- *Nizoral Tablets 200 mg*
- *Ketoconazol 200mg TAB*

NYSTATIN

Indications: candidiasis; vaginal infection, skin and oral infection
Side Effects: nausea, vomiting, diarrhoea at high doses; oral irritation and sensitisation; rash (including urticaria) and rarely Stevens-Johnson syndrome.
Dose: By mouth, intestinal candidiasis 500 000 units every 6 hours, doubled in severe infection; child 100 000 units 4 times daily
For use as mouth wash in oral candidiasis, place 1 ml of the suspension in the mouth and retain near lesions 4 times daily; continued for 48 hours after lesions have resolved

- *Nystatin 100, 000 Units/ml. 15ml./Bottle Oral Drops*

- *Mycostatin Suspension 100, 000 Units/ml*

POSACONAZOLE

Indications: Invasive Aspergillus and Candida infections***:*** Suspension and delayed-release tablets (13 years and older) and injection (18 years and older)***:*** Prophylaxis of invasive Aspergillus and Candida infections in patients who are at high risk of developing these infections due to being severely immunocompromised (hematopoietic stem cell transplant [HSCT] recipients with graft-versus-host disease [GVHD] or those with prolonged neutropenia secondary to chemotherapy for hematologic malignancies). Oropharyngeal candidiasis***:*** Suspension (13 years and older)***:*** Treatment of oropharyngeal candidiasis (including patients refractory to itraconazole and/or fluconazole or amphotericin B (based on canadian labeling).
Cautions: cardiomyopathy, bradycardia, symptomatic arrhythmias, history of QT interval prolongation, concomitant use with other drugs known to cause QT-interval prolongation monitor electrolytes (including potassium, magnesium, and calcium) before and during therapy monitor liver function before and during therapy. body-weight under 60 kg—risk of side effects**,** increased; body-weight over 120 kg—risk of treatment failure possibly increased.
Contra-indications: acute porphyria.
Hepatic impairment: monitor liver function; manufacturer advises caution.
Pregnancy: manufacturer advises avoid unless potential benefit outweighs risk and recommends effective contraception during treatment (shows toxicity in animal studies).
Breast-feeding: manufacturer advises avoid—present in milk in animal studies.
Side Effects: Most common***:*** gastro-intestinal disturbances (including nausea, vomiting, abdominal pain, diarrhoea, constipation, dyspepsia, and flatulence) dizziness, headache, paraesthesia, drowsiness, fatigue, fever, anorexia blood disorders (including anaemia, neutropenia, and thrombocytopenia), electrolyte disturbances dry mouth. rash, pruritus. less commonly***:***

pancreatitis hepatic disorders gastro-oesophageal reflux arrhythmias, bradycardia, tachycardia, palpitation, changes in blood pressure, oedema, vasculitis cough, hiccups, convulsions, neuropathy, tremor, aphasia, insomnia, hyperglycaemia, menstrual disorders, renal failure, musculoskeletal pain, visual disturbances, mouth ulcers, and alopecia. rarely*:* ileus, cardiac failure, myocardial infarction, stroke, thrombosis, syncope, pneumonitis, psychosis, depression, encephalopathy, adrenal insufficiency, breast pain, hearing impairment, and Stevens-Johnson syndrome.

dose ADULT over 18 years*:* 400 mg twice daily with food or if food not tolerated, 200 mg 4 times daily. Oropharyngeal candidiasis (severe infection or in immunocompromised patients only). ADULT over 18 years*:* mg with food on first day, then 100 mg once daily with food for 13 days. Prophylaxis of invasive fungal infections in patients undergoing bone-marrow transplantation or receiving chemotherapy for acute myeloid leukaemia and myelodysplastic syndrome who are expected to become neutropenic, and who are intolerant of fluconazole or itraconazole*:* ADULT over 18 years*:* 200 mg 3 times daily with food (starting before transplantation or before chemotherapy and continued until neutrophil count recovers).

Note : Where possible, tablets should be used in preference to the suspension because the tablets have a higher bioavailability; the suspension is not interchangeable with the tablets on a milligram-for-milligram basis

- *Posaconazole syrup 200mg/ 5ml.*

ANTIVIRAL DRUGS

ACYCLOVIR

Indications: herpes simplex and varicella–zoster

Cautions: maintain adequate hydration (especially with infusion or high doses); monitor neutrophil count at least twice weekly in neonates; renal impairment, Pregnancy & breast feeding.

Side Effects: nausea, vomiting, abdominal pain, diarrhoea, headache, fatigue, rash, urticaria, pruritus, photosensitivity; very rarely hepatitis, jaundice, dyspnea,

neurological reactions (including dizziness, confusion, hallucinations, convulsions and drowsiness), acute renal failure, anaemia, thrombocytopenia and leucopenia; on intravenous infusion, severe local inflammation (sometimes leading to ulceration), and very rarely agitation, tremors, psychosis and fever

Dose: By mouth, herpes simplex, treatment, 200 mg (400 mg in the immunocompromised or if absorption impaired) 5 times daily, usually for 5 days (longer if new lesions appear during treatment or if healing incomplete; increase dose to 800 mg 5 times daily for genital herpes in the immunocompromised); CHILD under 2 years, half adult dose, over 2 years, adult dose

Herpes simplex, prevention of recurrence, 200 mg 4 times daily or 400 mg twice daily possibly reduced to 200 mg 2 or 3 times daily and interrupted every 6–12 months

Herpes simplex, prophylaxis in the immunocompromised, 200–400 mg 4 times daily; CHILD under 2 years, half adult dose, over 2 years, adult dose

Varicella and herpes zoster, treatment, 800 mg 5 times daily for 7 days; CHILD, varicella, 20 mg/kg (max. 800 mg) 4 times daily for 5 days or under 2 years 200 mg 4 times daily, 2–5 years 400 mg 4 times daily, over 6 years 800 mg 4 times daily

Attenuation of chickenpox (if varicella–zoster immunoglobulin not indicated), ADULT and CHILD 40 mg/kg daily in 4 divided doses for 7 days starting 1 week after exposure

By intravenous infusion, **treatment of herpes simplex in the immunocompromised**, severe initial genital herpes, and varicella–zoster, 5 mg/kg every 8 hours usually for 5 days, doubled to 10 mg/kg every 8 hours in varicella–zoster in the immunocompromised and in simplex encephalitis (usually given for at least 10 days in encephalitis, possibly for 14–21 days); prophylaxis of herpes simplex in the immunocompromised, 5 mg/kg every 8 hours on the basis of ideal body weight. NEONATE and INFANT up to 3 months, with disseminated herpes simplex, 20 mg/kg every 8 hours for 14 days (21 days if CNS involvement); varicella–zoster 10–20 mg/kg every 8 hours for at least 7 days; CHILD 3 months–12 years, herpes simplex or varicella–zoster, 250 mg/m^2 every 8 hours usually for 5 days, doubled to 500 mg/m^2

every 8 hours for varicella–zoster in the immunocompromised and in simplex encephalitis (usually given for at least 10 days in encephalitis, possibly for 14–21 days)

- *Zovirax Intravenous Infusion, Powder For Reconstitution, Aciclovir (As Sodium Salt). 250 mg, Vial*
- *Zovirax 200 mg/5 ml Suspension ,*

NUCLEOSIDE REVERSE TRANSCRIPTASE INHIBITORS.

ABACAVIR

Indications: HIV infection in combination with other antiretroviral drugs

***Cautions*:** test for HLA-B*5701 allele before treatment or if restarting treatment and HLA-B*5701 status not known—increased risk of hypersensitivity reaction in presence of HLA-B*5701 allele; HIV load greater than 100 000 copies/ml; patients at high risk of cardiovascular disease (especially if 10-year cardiovascular risk greater than 20%);

Contra-indications: Hypersensitivity**:** do not restart abacavir following hypersensitive reaction without regard of HLA-B-5701, may cause hypotension, death

***Hepatic impairment*:** also avoid in moderate impairment unless essential; avoid in severe impairment

***Renal impairment*:** manufacturer advises avoid in end-stage renal disease; avoid if eGFR less than 50 ml/minute/1.73 m^2

***Side Effects*:** hypersensitivity reactions.
very rarely Stevens-Johnson syndrome and toxic epidermal necrolysis; rash and gastro-intestinal disturbances more common in children.

***Dose*:** 600 mg daily in 1–2 divided doses

- *Ziagen Tablets 300 mg.*

DARUNAVIR

Indications: HIV infection in combination with other antiretroviral drugs

Cautions: Protease inhibitors are associated with hyperglycaemia and should be used with caution in

diabetes. Caution is also needed in patients with haemophilia who may be at increased risk of bleeding, also sulfonamide sensitivity; monitor liver function before and during treatment.
Contra-indications: acute porphyria
Hepatic impairment: should be used with caution in patients with chronic hepatitis B or C (increased risk of hepatic side effects).
Pregnancy: advises use only if potential benefit outweighs risk (if required, use the twice daily dose regimen).
Breast-feeding: by HIV-positive mothers may cause HIV infection in the infant and should be avoided.
Side Effects: MOST COMMON ***:*** peripheral neuropathy less commonly myocardial infarction, angina, QT interval prolongation, tachycardia, hypertension, flushing, peripheral oedema, dyspnea, cough, anxiety, memory impairment, depression, abnormal dreams, increased appetite, weight changes, pyrexia, hypothyroidism, osteoporosis, gynaecomastia, erectile dysfunction, reduced libido, dysuria, polyuria, nephrolithiasis, renal failure, arthralgia, dry eyes, conjunctivalhyperaemia, throat irritation, dry mouth, stomatitis, nail discoloration, acne, eczema, increased sweating, alopecia.
Dose: ADULT over 18 years previously treated with antiretroviral therapy 600 mg twice daily with low-dose ritonavir Or (if no resistance to darunavir, if plasma HIV-RNA concentration less than 100 000 copies/ml, and if CD4 cell count greater than 100 cells $\times 10^6$/litre) 800 mg once daily with cobicistat or with low-dose ritonavir. ADULT over 18 years not previously treated with antiretroviral therapy 800 mg once daily with cobicistat or with low-dose ritonavir.

- *Prezista Tablets 400 mg, 600 mg.*

EFAVIRENZ

Indications: HIV infection in combination with other antiretroviral drugs.
Cautions: elderly; history of mental illness or seizures; monitor liver function if receiving other hepatotoxic drugs. Rash. Rash, usually in the first 2 weeks, is the most common side-effect; discontinue if severe rash with blistering, desquamation, mucosal involvement or fever;

if rash mild or moderate, may continue without interruption—usually resolves within 1 month. Psychiatric disorders Patients or their carers should be advised to seek immediate medical attention if symptoms such as severe depression, psychosis or suicidal ideation occur.
Contra-indications: acute porphyria.
Hepatic impairment: in mild liver disease, monitor for dose related ***Side Effects:*** **(**e.g. CNS effects) and monitor liver function (avoid in moderate to severe impairment) greater risk of hepatic ***Side Effects:*** in chronic hepatitis B or C.
Renal impairment: manufacturer advises caution in severe renal failure (no information available).
Pregnancy: reports of neural tube defects when used in first trimester Pregnancies in HIV-positive women and babies born to them should be reported prospectively to the National Study of HIV in pregnancy and Childhood and to the Anti-retroviral pregnancy Registry.
Side Effects: MOST COMMON ***:*** rash including Stevens-Johnson syndrome (see Rash above); abdominal pain, diarrhoea, nausea, vomiting; anxiety, depression, sleep disturbances, abnormal dreams, dizziness, headache, fatigue, impaired concentration (administration at bedtime especially in first 2–4 weeks reduces CNS effects); pruritus. less commonly pancreatitis, hepatitis, flushing, psychosis, mania, suicidal ideation, amnesia, ataxia, tremor, convulsions, gynaecomastia, blurred vision, tinnitus. rarely hepatic failure, suicide, photosensitivity. also reported raised serum cholesterol.
Dose: 600 mg once daily

- *Sustiva Capsules 200mg, Tablets 600 mg.*

INDINAVIR SULFATE

Indications: It is a protease inhibitors for treatment of HIV infection in combination with antiretroviral agents.
Cautions: ensure adequate hydration (risk of nephrolithiasis especially in children); patients at risk of nephrolithiasis (monitor for nephrolithiasis); avoid in porphyria
Contra-indications: Pregnancy; breast-feeding
Side Effects: dry mouth, hypoaesthesia, dry skin, hyperpigmentation, alopecia, paronychia, interstitial

nephritis (with medullary calcification and cortical atrophy in asymptomatic severe leucocyturia), nephrolithiasis (may require interruption or discontinuation; more frequent in children), dysuria, haematuria, crystalluria, proteinuria, pyuria (in children); haemolytic anaemia

Dose: 800 mg every 8 hours; CHILD and ADOLESCENT 4–17 years, 500 mg/m^2 every 8 hours (max. 800 mg every 8 hours); CHILD under 4 years, safety and efficacy not established

- *Crixivan Capsules 400 mg*

LAMIVUDINE

Indications HIV infection in combination with other antiretroviral drugs

Cautions: Chronic Hepatitis B or C; hepatic or renal impairment; pregnancy; Recurrent hepatitis in patients with chronic hepatitis B may occur on discontinuation of lamivudine. When treating chronic hepatitis B with lamivudine, monitor liver function tests at least every 3 months and serological markers of hepatitis B every 6 months, more frequently in patients with advanced liver disease or following transplantation (monitoring to continue after discontinuation)

Contra-indications: Breast feeding

Side Effects: gastro-intestinal disturbances (such as nausea, vomiting, abdominal pain, flatulence and diarrhoea), anorexia, pancreatitis, liver damage, dyspnea, cough, headache, insomnia, dizziness, fatigue, blood disorders (including anaemia, neutropenia, and thrombocytopenia), myalgia, arthralgia, rash, urticaria, and fever, peripheral neuropathy, muscle disorders including rhabdomyolysis, nasal symptoms, alopecia

Dose: 150 mg every 12 hours or 300 mg once daily; child 3 months–12 years, 4 mg/kg every 12 hours; max. 300 mg daily

- *3TC 150mg Tab 150mg*
- *Epivir150mg Tab*

LINEZOLID

Indications: Treatment of vancomycin-resistant Enterococcus faecium (VRE) infections. nosocomial

pneumonia caused by Staphylococcus aureus (including MRSA) or Streptococcus pneumoniae (including multidrug-resistant strains [MDRSP]). complicated and uncomplicated skin and skin structure infections (including diabetic foot infections without concomitant osteomyelitis). community-acquired pneumonia caused by susceptible gram-positive organisms. Linezolid is an option if a glycopeptide, such as vancomycin, cannot be used to treat pneumonia or severe skin and soft-tissue infections caused by MRSA. not active against Gram-negative organisms (must be given with other antibacterial if the infection also involves Gram-negative organisms. (the combination should be used for mixed skin and soft tissue infections only when other treatments are not available).

Cautions: Monitor, full blood count (including platelet count) weekly.history of seizures.unless close observation and blood-pressure monitoring possible avoid in uncontrolled hypertension, phaeochromocytoma, carcinoid tumour, thyrotoxicosis, bipolar depression, schizophrenia, or acute confusional states.

Contra-indications: in patients taking any medicinal product which inhibits monoamine oxidases A or B (e.g. phenelzine, isocarboxazid) or within two weeks of taking any such medicinal product.

Hepatic impairment: in severe hepatic impairment manufacturer advises use only if potential benefit outweighs risk

Renal impairment: manufacturer advises metabolites may accumulate if eGFR less than 30 ml/minute/1.73 m^2

Pregnancy: manufacturer advises use only if potential benefit outweighs risk—no information available

Breast-feeding: manufacturer advises avoid—present in milk in animal studies.

Side Effects: Most common: diarrhoea (antibiotic-associated colitis reported) nausea, vomiting, taste disturbances, headache. less commonly***:*** thirst, dry mouth, glossitis, stomatitis, tongue discoloration, abdominal pain, dyspepsia, gastritis, constipation, pancreatitis, hypertension, fever, fatigue, dizziness, insomnia, hypoaesthesia, paraesthesia, tinnitus, polyuria, leucopenia, thrombocytopenia, eosinophilia, electrolyte disturbances, blurred vision, rash, pruritus, diaphoresis,

injection-site reactions. rarely*:* tachycardia, transient ischaemic attacks, renal failure, also reported tooth discoloration, convulsions, lactic acidosis, hyponatraemia, pancytopenia, anaemia, Stevens-Johnson syndrome, toxic epidermal necrolysis, peripheral and optic neuropathy reported on prolonged therapy.
Dose: Adult*:* 600 mg every 12 hours usually for 10–14 days (max. duration of treatment 28 days). CHILD: [unlicensed] 1 week–12 years*:* 10 mg/kg every 8 hours 12–18 years*:* adult dose.

- *Zyvox Tablets 600 mg*
- *Zyvox Inj. 600mg I.V*

LOPINAVIR

Indications: **HIV infection in combination with other** antiretroviral drugs
Cautions: concomitant use with drugs that prolong QT or PR interval cardiac conduction disorders, structural heart disease, patients at high risk of cardiovascular disease (especially if 10-year cardiovascular risk greater than 20%), pancreatitis, monitor liver function before and during treatment.
Contra-indications: acute porphyria
Hepatic impairment: avoid oral solution due to propylene glycol content (manufacturer advises avoid capsules and tablets in severe impairment) should be used with caution in patients with chronic hepatitis B or C (increased risk of hepatic side effects.
Renal impairment: avoid oral solution due to propylene glycol content (use tablets with caution in severe impairment).
Pregnancy: avoid oral solution due to high propylene glycol content (use tablets only if potential benefit outweighs risk (toxicity in animal studies)).
Side Effects: Most common *:* gastro-intestinal disturbances (including diarrhoea, nausea, vomiting, abdominal pain, flatulence), anorexia, hepatic dysfunction, pancreatitis; blood disorders including anaemia, neutropenia, and thrombocytopenia; sleep disturbances, fatigue, headache, dizziness, paraesthesia, myalgia, myositis, rhabdomyolysis; taste disturbances; rash, pruritus, Stevens-Johnson syndrome, hypersensitivity reactions including anaphylaxis, see also

notes above for lipodystrophy and metabolic effects (Lipodystrophy Syndrome), and Osteonecrosis. also colitis, weight changes, hypertension, anxiety, neuropathy, sexual dysfunction, amenorrhoea, menorrhagia, arthralgia, night sweats. less commonly gastro-intestinal ulcer, rectal bleeding, dry mouth, stomatitis, myocardial infarction, AV block, cerebrovascular accident, deep vein thrombosis, abnormal dreams, convulsions, tremor, nephritis, haematuria, visual disturbances, tinnitus, alopecia.
Dose: 2 tablets twice daily alternatively, in adults with a HIV strain that has less than 3 mutations to protease inhibitors, 4 tablets may be taken once daily.

- *Kaletra Tablets, lopinavir 200 mg, ritonavir 50 mg*

MOXIFLOXACIAN

Indications: BROAD SPECTRUM antibacterial indicated for the treatment of adults (≥ 18 years of age). Acute Bacterial Sinusitiscaused by (Streptococcus pneumoniae, Haemophilus influenzae, or Moraxella catarrhalis). Acute Bacterial Exacerbation of Chronic Bronchitis caused by (Streptococcus pneumoniae, Haemophilus influenzae, Haemophilus parainfluenzae, Klebsiella pneumoniae, methicillin-susceptible Staphylococcus aureus, or Moraxella catarrhalis). Community Acquired Pneumonia caused by (Streptococcus pneumoniae (including multi-drug resistant isolates*), Haemophilus influenzae, Moraxella catarrhalis, methicillin-susceptible Staphylococcus aureus, Klebsiella pneumoniae, Mycoplasma pneumoniae, or Chlamydophila pneumoniae). Uncomplicated Skin and Skin Structure Infections caused by (methicillin susceptible Staphylococcus aureus or Streptococcus pyogenes). Complicated Skin and Skin Structure Infections caused by (methicillin susceptible Staphylococcus aureus, Escherichia coli, Klebsiella pneumoniae, or Enterobacter cloacae). Complicated Intra-Abdominal Infections including polymicrobial infections such as abscess caused by (Escherichia coli, Bacteroides fragilis, Streptococcus anginosus, Streptococcus constellatus, Enterococcus faecalis, Proteus mirabilis,

Clostridium perfringens, Bacteroides thetaiotaomicron, or Peptostreptococcus species).
Cautions: not recommended for neonates.
Pregnancy: should be avoided in pregnancy because they have been shown to cause arthropathy in animal studies.
Contra-indications: history of hypersensitivity to moxifloxacin or any member of the quinolone class of antimicrobial agents.
Side Effects: Most common taste disturbances, ocular discomfort (including pain, irritation and dryness), hyperaemia. less commonly vomiting, headache, paraesthesia, corneal disorders (including keratitis, erosion, and staining), conjunctival haemorrhage, eyelid erythema, visual disturbances, nasal discomfort, pharyngolaryngeal pain also reported nausea, palpitation, dyspnea, dizziness, raised intra-ocular pressure, photophobia, rash, pruritus. dose 400 mg (orally or as an intravenous infusion) once every 24 hours.

- *Avelox Tablets 400 mg*

OSELTAMIVIR

Indications: most effective for the treatment of influenza if started within a few hours of the onset of symptoms. they are licensed for use within 48 hours of the first symptoms. Oseltamivir can reduce the risk of complications from influenza in the elderly and in patients with chronic disease Oseltamivir are licensed for post-exposure prophylaxis of influenza when influenza is circulating in the community. Oseltamivir should be given within 48 hours of exposure to However, in patients with severe influenza or in those who are immunocompromised, antivirals may still be effective after this time if viral shedding continues [unlicensed use].
also licensed for use in exceptional circumstances (e.g. when vaccination does not cover the infecting strain) to prevent influenza in an epidemic
Contra-indications: in patients with known serious hypersensitivity to oseltamivir or any component of the product. Severe allergic reactions have included anaphylaxis and serious skin reactions including toxic epidermal necrolysis, Stevens-Johnson Syndrome, and .

Renal impairment for treatment, use 30 mg twice daily if eGFR 30–60 ml/minute/1.73 m^2 (30 mg once daily if eGFR 10–30 ml/minute/1.73 m^2). for prevention, use 30 mg once daily if eGFR 30–60 ml/minute/1.73 m^2 (30 mg every 48 hours if eGFR 10-30 ml/minute/1.73 m^2) avoid for treatment and prevention if eGFR less than 10 ml/minute/1.73 m^2
Pregnancy use only if potential benefit outweighs risk (e.g. during a pandemic) amount probably too small to be harmful (use only if potential benefit outweighs risk) (e.g. during a pandemic)
Side Effects: nausea, vomiting, abdominal pain, dyspepsia, headache; less commonly arrhythmias, convulsions and altered consciousness (usually in children and adolescents), eczema, rash; rarely hepatitis, gastro-intestinal bleeding, neuropsychiatric disorders (usually in children and adolescents), thrombocytopenia, visual disturbances, Stevens-Johnson syndrome, toxic epidermal necrolysis
Dose: Prevention of influenza: ADULT and CHILD over 13 years: 75 mg once daily for 10 days for post-exposure prophylaxis; for up to 6 weeks during an epidemic. NEONATE: 2 mg/kg once daily for 10 days for post-exposure prophylaxis.
CHILD 1–3 months : (2.5 mg/kg once daily for 10 days for post–exposure prophylaxis.
3 months–1 year : 3 mg/kg once daily for 10 days for post-exposure prophylaxis.
1–13 years: body-weight 10–15 kg, 30 mg once daily for 10 days for post-exposure prophylaxis (for up to 6 weeks during an epidemic). body-weight 15–23 kg, 45 mg once daily for 10 days for post-exposure.
prophylaxis (for up to 6 weeks during an epidemic): body-weight 23–40 kg, 60 mg once daily for 10 days for post-exposure prophylaxis (for up to 6 weeks during an epidemic); body-weight over 40 kg, adult dose
Treatment of influenza: ADULT and CHILD over 13 years: 75 mg every 12 hours for 5 days. NEONATE, 2 mg/kg every 12 hours for 5 days; CHILD 1–3 months: 2.5 mg/kg every 12 hours for 5 days.
3 months–1 year : 3 mg/kg every 12 hours for 5 days; 1–13 years, body-weight 10–15 kg, 30 mg every 12 hours for 5 days, body-weight 15–23 kg, 45 mg every 12 hours

for 5 days, body-weight 23–40 kg, 60 mg every 12 hours for 5 days, body-weight over 40 kg, adult dose
Note Not for use in children under 1 year of age unless there is a pandemic

- *Tamiflu Capsules30 mg, 45 mg*
  If suspension not available, capsules can be opened and the contents mixed with a small amount of sweetened food, such as sugar water or *chocolate syrup, just before administration*

RIBAVIRIN (TRIBAVIRIN))

Indications: severe respiratory syncytial virus bronchiolitis in infants and children; in combination with peginterferon alfa or interferon alfa for chronic hepatitis C not previously treated in patients without liver decompensation, or for relapse in adults following previous response to interferon alfa
Cautions: Specific cautions for oral treatment
Exclude pregnancy before treatment; effective contraception essential during treatment and for 6 months after treatment in women and in men; routine monthly pregnancy tests recommended; condoms must be used if partner of male patient is pregnant (ribavirin excreted in semen); renal impairment, cardiac disease (assessment including ECG recommended before and during treatment—discontinue if deterioration); gout; determine full blood count, platelets, electrolytes, serum creatinine, liver function tests and uric acid before starting treatment and then on weeks 2 and 4 of treatment, then as indicated clinically—adjust dose if adverse reactions or laboratory abnormalities develop; test thyroid function before treatment and then every 3 months in children
Contra-indications: pregnancy (important teratogenic risk); breast-feeding
Specific contra-Indications for oral treatment: Severe cardiac disease, including unstable or uncontrolled cardiac disease in previous 6 months; haemoglobinopathies; severe debilitating medical conditions; severe hepatic dysfunction or decompensated cirrhosis; autoimmune disease (including autoimmune hepatitis); uncontrolled severe psychiatric condition; history of severe psychiatric condition in children

Specific side effects: for oral treatment: Haemolytic anaemia; nausea, vomiting, dyspepsia, abdominal pain, peptic ulcer, flatulence, diarrhoea, constipation, pancreatitis, appetite changes, weight loss, chest pain, tachycardia, palpitation, syncope, peripheral oedema, changes in blood pressure, flushing, dyspnea, cough, rhinitis, pharyngitis, interstitial pneumonitis, sleep disturbances, abnormal dreams, asthenia, impaired concentration and memory, psychoses, anxiety, depression, suicidal ideation (more frequent in children), dizziness, tremor, hypertonia, ataxia, dysphonia, myalgia, arthralgia, peripheral neuropathy, influenza-like symptoms, headache, hyperglycaemia, thyroid disorders, menstrual disturbances, reduced libido, impotence, prostatitis, micturition disorders, rash (including very rarely Stevens-Johnson syndrome and toxic epidermal necrolysis), pruritus, urticaria, photosensitivity, psoriasis, alopecia, dry skin, increased sweating, dry mouth, stomatitis, glossitis, taste disturbance, eye changes including blurred vision, tinnitus; neutropenia, thrombocytopenia, aplastic anaemia, lymphadenopathy, hypocalcaemia, hyperuricaemia; in children also growth retardation (including decrease in height and weight), Raynaud's disease, hypertriglyceridaemia, hyperkinesia, testicular pain, virilism, tooth disorders, and skin discoloration

Dose: Chronic hepatitis C, adultover 18 years (in combination with interferon alfa or peginterferon alfa), body-weight under 65 kg, 400 mg twice daily; body-weight 65–85 kg, 400 mg in the morning and 600 mg in the evening; body-weight over 85 kg, 600 mg twice daily; child and adolescent 3–17 years (in combination with interferon alfa), body-weight under 47 kg, 15 mg/kg daily in 2 divided doses; body-weight 47–49 kg, 200 mg in the morning and 400 mg in the evening; body-weight 50–65 kg, 400 mg twice daily; body-weight over 65kg, as adult

- *Rebetol 200mg Tab*

RITONAVIR

Indications: HIV infection in combination with other antiretroviral drugs; low doses used to increase effect of some protease inhibitors.

Cautions: concomitant use with drugs that prolong PR interval; cardiac conduction disorders, structural heart disease; pancreatitis.
Contra-indications: acute porphyria.
Hepatic impairment: avoid in decompensated liver disease (in severe impairment without decompensation, use 'booster' doses with caution (avoid treatment doses)).
Pregnancy: only use low-dose booster to increase the effect of other protease inhibitors Pregnancies in HIV-positive women and babies born to them should be reported prospectively to the National Study of HIV in pregnancy and Childhoodand to the Antiretroviral pregnancy Registry. Mitochondrial dysfunction has been reported in infants exposed to nucleoside reverse transcriptase inhibitors in utero; the main effects include haematological, metabolic, and neurological disorders; all infants whose mothers received nucleoside reverse transcriptase inhibitors during pregnancy should be monitored for relevant signs or symptoms.
Breast-feeding: by HIV-positive mothers may cause HIV infection in the infant and should be avoided.
Side Effects: most common gastro-intestinal haemorrhage, blood pressure changes, oedema, syncope, flushing, cough, pharyngitis, anxiety, confusion, seizures, peripheral neuropathy, fever, decreased blood thyroxine concentration, menorrhagia, renal impairment, arthralgia, blurred vision, mouth ulcers, acne. less commonly myocardial infarction, electrolyte disturbances. Rarely toxic epidermal necrolysis
Side Effects: of the protease inhibitors include gastro-intestinal disturbances (including diarrhoea, nausea, vomiting, abdominal pain, flatulence), anorexia, hepatic dysfunction, pancreatitis; blood disorders including anaemia, neutropenia, and thrombocytopenia; sleep disturbances, fatigue, headache, dizziness, paraesthesia, myalgia, myositis, rhabdomyolysis; taste disturbances; rash, pruritus, Stevens-Johnson syndrome, hypersensitivity reactions including anaphylaxis.
Dose Initially 300 mg every 12 hours for 3 days, increased in steps of 100 mg every 12 hours over notlonger than 14 days to 600 mg every 12 hours. Low-dose booster to increase effect of other protease inhibitors, 100–200 mg once or twice daily.

- *Norvir Tablets 100 mg*

TENOFOVAIR

Indications: HIV infection in combination with other antiretroviral drugs chronic hepatitis B infection with either compensated liver disease (with evidence of viral replication, and histologically documented active liver inflammation or fibrosis) ordecompensated liver disease
Cautions: test renal function and serum phosphate before treatment, then every 4 weeks (more frequently if at increased risk of renal impairment) for 1 year and then every 3 months, interrupt treatment if renal function deteriorates or serum phosphate decreases.
Contra-indications: Hypersensitivity to tenofovir or any component of the formulation; concurrent use with fixed-dose combination products that contain tenofovir (Truvada, Atripla, Complera, or Stribild); concurrent use with adefovir (Hepsera
Renal Impairment: Children: No dosage adjustment provided in manufacturer's labeling (has not been studied). Adults*:* Note*:* Use of powder formulation has not been evaluated in renal impairment. CrCl 30-49 ml/minute*:* 300 mg every 48 hours CrCl 10-29 ml/minute*:* 300 mg every 72-96 hours CrCl <10 ml/minute without hemodialysis*:* No dosage adjustment provided in manufacturer's labeling, has not been studied. Hemodialysis*:* 300 mg following dialysis every 7 days or after a total of ~12 hours of dialysis (usually once weekly assuming 3 dialysis sessions lasting about 4 hours each).
Hepatic Impairment: No dosage adjustment necessary.
Side Effects: Central nervous system*:* Insomnia, headache pain, dizziness, depression Dermatologic*:* Skin rash (includes maculopapular, pustular, or vesiculobullous rash; pruritus; or urticaria:, pruritus Endocrine & metabolic*:* Hypercholesterolemia, increased serum triglycerides Gastrointestinal*:* Abdominal pain, nausea, diarrhea, vomiting Neuromuscular & skeletal*:* Decreased bone mineral density (28%; ≥5% at spine or ≥7% at hip), increased creatine phosphokinase, weakness Miscellaneous*:* Fever Cardiovascular*:* Chest pain Central nervous system*:* Fatigue, anxiety, peripheral neuropathy Dermatologic*:* Diaphoresis Endocrine & metabolic*:* Weight loss, glycosuria, hyperglycemia,

lipodystrophy Gastrointestinal*:* Increased serum amylase, anorexia, dyspepsia, flatulence Genitourinary*:* Hematuria, Hematologic & oncologic*:* Neutropenia Hepatic*:* Increased serum ALT, increased serum AST, increased serum transaminases increased serum alkaline phosphatase Neuromuscular & skeletal*:* Back pain, arthralgia, myalgia, Renal*:* Increased serum creatinine, renal failure. Respiratory*:* Sinusitis, upper respiratory tract infection, nasopharyngitis, pneumonia Postmarketing and/orcase reports*:* Angioedema, exacerbation of hepatitis B (following discontinuation), Fanconi's syndrome, hepatitis, hypersensitivity reaction, hypokalemia, hypophosphatemia, immune reconstitution syndrome, increased gamma-glutamyl transferase, interstitial nephritis, lactic acidosis, myopathy, nephrogenic diabetes insipidus, nephrotoxicity, osteomalacia, pancreatitis, polyuria, proteinuria, proximal tubular nephropathy, renal insufficiency, renal tubular necrosis, rhabdomyolysis, severe hepatomegaly with steatosis

Dose: adult over 18 years, 245 mg once daily. MISSED DOSE *:* If a dose is more than 12 hours late, the missed dose should not be taken and the next dose should be taken at the normal time.

- *Viread Tablets 300 mg*

TENOFOVIR + Efavirenz + Emtrictabin

Indications: Treatment of HIV-1 infection

Contra-indications: History of clinically-significant hypersensitivity (eg, Stevens-Johnson syndrome, erythema multiforme, or toxic skin reactions) to efavirenz; concurrent use of bepridil, cisapride, midazolam, triazolam, voriconazole, ergot alkaloids (includes dihydroergotamine, ergotamine, ergonovine, methylergonovine), St John's wort, pimozide

Renal impairment: Moderate-to-severe renal impairment (CrCl <50 ml/minute)*: (*Use not recommended). Hepatic Impairment Mild hepatic impairment (Child-Pugh class A)*:* Use with caution. Moderate or severe hepatic impairment (Child-Pugh class B, C)*:* Not recommended.

Side Effects: The complete adverse reaction profile of combination therapy has not been established. The

following adverse effects were noted in clinical trials with combination therapy*:* Most common*:* Endocrine & metabolic*:* Hypercholesterolemia. Less common*:* Central nervous system*:* Depression, fatigue, dizziness, headache, anxiety, insomnia, somnolence, abnormal dreams Dermatologic*:* Rash. Endocrine & metabolic*:* Triglycerides increased, hyperglycemia. Gastrointestinal*:* Nausea, diarrhea, serum amylase increased, vomiting. Hematologic*:* Neutropenia. Hepatic*:* AST increased, ALT increased, alkaline phosphatase increased. Neuromuscular & skeletal*:* Creatine increased. Renal*:* Hematuria. Respiratory*:* Sinusitis, upper respiratory infection, nasopharyngitis. rare (Limited to important or life-threatening)*:* Glycosuria

Dose: Adult*:* Note*:* Prior to initiation, patients should be tested for hepatitis B infection, and baseline estimated creatinine clearance, serum phosphorus, urine glucose, and urine protein should be assessed in all patients. HIV infection*:* Oral*:* One tablet once daily.

Note: Recommended as an initial regimen for antiretroviral-naive patients.

- *Atripla Efavirenz/ emtrictabin/ tenofovir disoproxil (600mg/200mg/245mg).*

VALACICLOVIR

It is prodrug for Aciclovir.

Indications: treatment of herpes zoster; treatment of initial and suppression of recurrent herpes simplex infections of skin and mucous membranes including initial and recurrent genital herpes; reduction of transmission of genital herpes; prevention of cytomegalovirus disease following renal transplantation

Cautions: maintain adequate hydration (especially with infusion or high doses); monitor neutrophil count at least twice weekly in neonates; renal impairment; pregnancy, breast-feeding

Side Effects: nausea, vomiting, abdominal pain, diarrhoea, headache, fatigue, rash, urticaria, pruritus, photosensitivity; very rarely hepatitis, jaundice, dyspnea, neurological reactions (including dizziness, confusion, hallucinations, convulsions and drowsiness), acute renal failure, anaemia, thrombocytopenia and leucopenia; on *intravenous infusion*, severe local inflammation

(sometimes leading to ulceration), and very rarely agitation, tremors, psychosis and fever
Dose: Herpes zoster, 1 g 3 times daily for 7 days
Herpes simplex, first episode, 500 mg twice daily for 5 days (longer if new lesions appear during treatment or if healing incomplete); recurrent infection, 500 mg twice daily for 5 days
Herpes simplex, suppression, 500 mg daily in 1–2 divided doses (in immunocompromised, 500 mg twice daily)
Reduction of transmission of genital herpes, 500 mg once daily to be taken by the infected partner
Prevention of cytomegalovirus disease following renal transplantation (preferably starting within 72 hours of transplantation), 2 g 4 times daily usually for 90 days
CHILD not recommended

- *Valaciclovir 500mg Tab*
- *Valtrex Tablets 500 mg*

ZIDOVUDINE (Azidothymidine)

Nucleoside reverse transcriptase inhibitors
Indications: HIV infection in combination with other antiretroviral drugs; prevention of maternal-fetal HIV transmission.
Cautions: haematological toxicity particularly with high dose and advanced disease—monitor full blood count after 4 weeks of treatment, then every 3 months; vitamin B_{12} deficiency (increased risk of neutropenia); if anaemia or myelo suppression occur, reduce dose or interrupt treatment according to product literature, or consider other treatment; elderly;
Contra-indications: abnormally low neutrophil counts or haemoglobin concentration, neonates with hyperbilirubinaemia requiring treatment other than phototherapy, or with raised transaminase, acute porphyria
Hepatic impairment: accumulation may occur
Renal impairment: reduce oral dose to 300–400 mg daily in divided doses or intravenous dose to 1 mg/kg 3–4 times daily if eGFR is less than 10 ml/minute/1.73 m^2; avoid Combivir (or non-proprietary equivalents) if eGFR less than 50 ml/minute/1.73m^2.
Pregnancy: Treatment of HIV infection in Pregnancy aims to reduce the risk of toxicity to the fetus (although

information on the teratogenic potential of most antiretroviral drugs is limited), to minimise the viral load and disease progression in the mother, and to prevent transmission of infection to the neonate. All treatment options require careful assessment by a specialist. Combination antiretroviral therapy maximises the chance of preventing transmission and represents optimal therapy for the mother. However, it may be associated with a greater risk of preterm delivery. Pregnancies in HIV-positive women and babies born to them should be reported prospectively to the National Study of HIV in pregnancy and Childhood and to the Antiretroviral pregnancy Registry.
Mitochondrial dysfunction has been reported in infants exposed to nucleoside reverse transcriptase inhibitors in utero; the main effects include haematological, metabolic, and neurological disorders; all infants whose mothers received nucleoside reverse transcriptase inhibitors during pregnancy should be monitored for relevant signs or symptoms.
Breast-feeding: by HIV-positive mothers may cause HIV infection in the infant and should be avoided.
Dose: 1 tablet twice daily

- *Zidovudine 100 mg. Cap.*
- *Retrovir Capsules 100 mg*
- *With lamivudine*
- *Combivir Tablets zidovudine 300 mg, lamivudine 150 mg*

child body-weight over 14 kg
Note: Tablets may be crushed and mixed with semi-solid food or *liquid just before administration*

ANTIPROTOZOAL AND ANTIHELMENTHIC DRUGS

CHLOROQUINE

Indications: chemoprophylaxis and treatment of malaria; rheumatoid arthritis and lupus erythematosus.
Cautions: Renal impairment, Pregnancy (but for malaria benefit outweighs risk), may exacerbate psoriasis, neurological disorders (avoid for prophylaxis if history of epilepsy, may aggravate myasthenia gravis, severe gastro-intestinal disorders, G6PD deficiency, ophthalmic

examination and long-term therapy, avoid concurrent therapy with hepatotoxic drugs
Side Effects: gastro-intestinal disturbances, headache; also hypotension, convulsions, visual disturbances, depigmentation or loss of hair, skin reactions (rashes, pruritus); rarely, bone-marrow suppression, hypersensitivity reactions such as urticaria and angioedema; other side effects (not usually associated with malaria prophylaxis or treatment
Dose: treatment of benign malarias, adult dosage regimen, initial dose 600 mg (base) followed by a single dose of 300 mg after 6-8 hours, followed by a single dose of 300 mg on each of the next 2 days (approximate total cumulative dose is 25 mg/kg (base).Chloroquine alone is adequate for Plasmodium malaria infections.
Children are given an initial dose of chloroquine 10 mg/kg (base) followed by a single dose of 5 mg/kg after 6-8 hours, then a single dose of 5 mg/kg on each of the following 2 days. If the patient is seriously ill, chloroquine is given by IV infusion.
By IV infusion; adult dose is 10 mg/kg (base) infused over 8 hours, followed by three 8 - hours infusions of 5 mg/kg (base)each. Oral therapy should be started as soon as possible to complete the course.
The total cumulative dose of the course should be 25 mg/kg of base.
Note: Chloroquine base 150 mg=chloroquine sulfate 200mg; chloroquine phosphate 250 mg

- *Chloroquine Phosphate 200 mg Tab*
- *Nivaquin Tablets 200 mg,*
- *Chloroquine Injection 40 mg/ml 5 ml Ampoules*

ALBENDAZOL

Indications*:* is indicated for the treatment of the following infections: Neurocysticercosis is indicated for the treatment of parenchymal neurocysticercosis due to active lesions caused by larval forms of the pork tapeworm, Taenia solium. Hydatid Disease is indicated for the treatment of cystic hydatid disease of the liver, lung, and peritoneum, caused by the larval form of the dog tapeworm, Echinococcus granulosus.
Cautions: Monitor theophylline levels if used concomitantly. Potential for bone marrow suppression,

aplastic anemia & agranulocytosis. Pre-existing neurocysticercosis may be uncovered in patients treated with albendazole for other conditions, apparent by neurological symptoms (e.g. seizures, increased intracranial pressure, and focal signs); promptly treat w/ corticosteroid & anticonvulsant therapy
Contra-indications: Hypersensitivity to albendazole or benzimidazoles.
Pregnancy: Use with caution if benefits outweigh risks.
Breast-feeding: unknown, use caution
Side Effects: Abnormal Liver Function Tests, Abdominal Pain, Nausea/Vomiting, Headache, Dizziness/Vertigo, Raised Intracranial Pressure, Meningeal Signs, Reversible Alopecia, Fever
Dose: Hydatid Disease: 60 kg or greater 400 mg twice daily, with meals 28-day cycle followed by a 14-day albendazole-free interval, for a total of 3 cycles. less than 60 kg 15 mg/kg/day given in divided doses twice daily with meals (max. total daily dose 800 mg)
Note: When administering in the pre- or post-surgical setting, optimal killing of cyst contents is achieved when 3 courses of therapy have been given.
Neurocysticercosis: 60 kg or greater 400 mg twice daily, with meals 8-30 days less than 60 kg 15 mg/kg/day given in divided doses twice daily with meals (max. total daily dose 800 mg)

- *Zental Tablets 400mg*

MEBENDAZOLE

Indications: threadworm, roundworm, whipworm, and hookworm infections
Cautions: pregnancy (toxicity in rats); breast-feeding
Side Effects: very rarely abdominal pain, diarrhoea, convulsions (in infants) and rash (including Stevens-Johnson syndrome and toxic epidermal necrolysis)
Dose: Threadworms, ADULT and CHILD over 2 years, 100 mg as a single dose; if reinfection occurs second dose may be needed after 2 weeks; CHILD under 2 years, not yet recommended
Whipworms, roundworm & hook worm***:*** ADULT and CHILD over 2 years, 100 mg twice daily for 3 days; CHILD under 2 years, not yet recommended

- *Mebendazole Tab 100 mg.*

- *Mebendazole Susp 100 mg. /5 ml. 30 ml.*
- *Vermox Tablets 100 mg*
- *Vermox Susp 100 mg/ 5 ml*

METRONIDAZOLE

Indications: high activity against anaerobic bacteria and protozoa; surgical and gynaecological sepsis in which activity against colonic anaerobes especially Bacteroides fragilis is important, trichomonal vaginitis, non-specific vaginitis, and E.histolytica and Giardia lamblia infections
Cautions: active CNS disease, disulfiram-like reaction with alcohol; hepatic impairment.
Side Effects: gastro-intestinal disturbances (including nausea and vomiting), taste disturbances, furred tongue, oral mucositis, anorexia; very rarely hepatitis, jaundice, pancreatitis, drowsiness, dizziness, headache, ataxia, psychotic disorders, darkening of urine, thrombocytopenia, pancytopenia, myalgia, arthralgia, visual disturbances, rash, pruritus, and erythema multiforme; on prolonged or intensive therapy peripheral neuropathy, transient epileptiform seizures, and leucopenia
Dose: Anaerobic infections (usually treated for 7 days and for 10 days in antibiotic-associated colitis), ADULTS by mouth, either 800 mg initially then 400 mg every 8 hours or 500 mg every 8 hours, CHILD 7.5 mg/kg every 8 hours; by rectum, 1 g every 8 hours for 3 days, then 1 g every 12 hours, CHILD every 8 hours for 3 days, then every 12 hours, age up to 1 year 125 mg, 1–5 years 250 mg, 5–10 years 500 mg, over 10 years, adult dose;
by intravenous infusion over 20 minutes, 500 mg every 8 hours; CHILD 7.5 mg/kg every 8 hours
Leg ulcers and pressure sores, by mouth, 400 mg every 8 hours for 7 days
Bacterial vaginosis, by mouth, 400–500 mg twice daily for 5–7 days or 2 g as a single dose
Pelvic inflammatory disease, by mouth, 400 mg twice daily for 14 days
Acute ulcerative gingivitis, by mouth, 200–250 mg every 8 hours for 3 days; CHILD 1–3 years 50 mg every 8 hours for 3 days; 3–7 years 100 mg every 12 hours; 7–10 years 100 mg every 8 hours

Acute oral infections, by mouth, 200 mg every 8 hours for 3–7 days; CHILD 1–3 years 50 mg every 8 hours for 3–7 days; 3–7 years 100 mg every 12 hours; 7–10 years 100 mg every 8 hours
Surgical prophylaxis, by mouth, 400–500 mg 2 hours before surgery; up to 3 further doses of 400–500 mg may be given every 8 hours for high-risk procedures; CHILD 7.5 mg/kg 2 hours before surgery; up to 3 further doses of 7.5 mg/kg may be given every 8 hours for high-risk procedures
By rectum, 1 g 2 hours before surgery; up to 3 further doses of 1 g may be given every 8 hours for high-risk procedures; CHILD 5–10 years 500 mg 2 hours before surgery; up to 3 further doses of 500 mg may be given every 8 hours for high-risk procedures
By intravenous infusion (if rectal administration inappropriate), 500 mg at induction; up to 3 further doses of 500 mg may be given every 8 hours for high-risk procedures; CHILD 7.5 mg/kg at induction; up to 3 further doses of 7.5 mg/kg may be given every 8 hours for high-risk procedures

- *Metronidazole 200 mg Tab.*
- *Metronidazole 125 mg/5ml Syrup.*
- *Metronidazole 0.5g. Inj. 100ml*
- *Flagyl 200 mg Tablets*
- *Metrogyl 125 mg/5 ml Suspension*
- *Metronidzole 500 mg Infusion*

PRIMAQUINE

Indications: adjunct in the treatment of Plasmodium vivax and P. ovale malaria (eradication of liver stages
Cautions: G6PD deficiency (test blood; systemic diseases associated with granulocytopenia (e.g. rheumatoid arthritis, lupus erythematosus); Pregnancy and breast-feeding
Side Effects: nausea, vomiting, anorexia, abdominal pain; less commonly methaemoglobinaemia, haemolytic anaemia especially in G6PD deficiency, leucopenia
Dose: In P. vivax infection***:*** adult dosage of 30 mg daily for 14 days and for P. ovale infection it is given in an adult dosage of 15 mg daily for 14 days.
Pregnancy: Third trimester***:*** Neonatal haemolysis and methaemoglobinaemia

- *Primaquine Phosphate Tab 7.5 mg.*
- *Primaquine Tablets 15 mg (7.5 mg Base).*

ANTIPNEUMOCYSTIS AGENTS

PENTAMIDINE

Indications: Pneumocystis Jiroveci, Pneumonia (pneumocystis carinii)pneumonia, prophylaxis of pneumocystis jiroveci (pneumocystis carinii)pneumonia, visceral leishmaniasis, cutaneous leishmaniasis, trypanosomiasis
Cautions: risk of severe hypotension following administration (monitor blood pressure before starting treatment, during administration, and at regular intervals, until treatment concluded.
patient should be lying downwhen receiving drug parenterally). hypokalaemia, hypomagnesaemia, coronary heart disease, bradycardia, history of ventricular arrhythmias, concomitant use with other drugs which prolong QT-interval. hypertension or hypotension. hyperglycaemia or hypoglycaemia leucopenia, thrombocytopenia, or anaemia. carry out laboratory monitoring according to product literature (care required to protect personnel during handling and administration)
Contra-indications: Hypersensitivity Hepatic impairment: Manufacturer advises caution.
Renal impairment: Reduce intravenous dose for pneumocystis pneumonia if creatinine clearance less than 10 ml/minute: in life threatening infection, use 4 mg/kg once daily for 7–10 days, then 4 mg/kg on alternate days to complete course of at least 14 doses.
in less severe infection, use 4 mg/kg on alternate days for at least 14 doses.
Pregnancy: manufacturer advises avoid unless essential
Breast-feeding: Manufacturer advises avoid unless essential
Side Effects: severe reactions, sometimes fatal, due to hypotension, hypoglycaemia, pancreatitis, and arrhythmias; also leucopenia, thrombocytopenia, acute renal failure, hypocalcaemia; also reported: azotaemia, abnormal liver-function tests, anaemia, hyperkalaemia, nausea and vomiting, dizziness, syncope, flushing,

hyperglycaemia, rash, and taste disturbances; Stevens-Johnson syndrome reported; on inhalation, bronchoconstriction (may be prevented by prior use of bronchodilators), cough, and shortness of breath; discomfort, pain, induration, abscess formation, and muscle necrosis at injection site

Dose: Treatment of Pneumocystis jiroveci (Pneumocystis carinii) pneumonia, by intravenous infusion: 4 mg/kg once daily for at least 14 days

Prophylaxis of Pneumocystis jiroveci (Pneumocystis carinii) pneumonia: by inhalation of nebulised solution: 300 mg every 4 weeks or 150 mg every 2 weeks.

Visceral leishmaniasis by deep intramuscular injection: 3–4 mg/kg on alternate days to max. total of 10 injections course may be repeated if necessary Cutaneous leishmaniasis by deep intramuscular injection 3–4 mg/kg once or twice weekly until condition resolves

Trypanosomiasis: by deep intramuscular injection or intravenous infusion: 4 mg/kg daily or on alternate days to total of 7–10 injections

Note: Direct intravenous injection should be avoided whenever possible and never given rapidly; intramuscular injections should be deep and preferably given into the buttock

- *Pentacarinat Injection, powder for reconstitution 300-mg vial*

6 - ENDOCRINE SYSTEM

ANTIDIABETIC DRUGS

SULPHONYL UREA

The sulphonylureas act mainly by augmenting insulin secretion and consequently are effective only when some residual pancreatic beta-cell activity is present; during long-term administration they also have an extrapancreatic action. All may cause hypoglycaemia but this is uncommon and usually indicates excessive dosage. Sulphonylurea-induced hypoglycaemia may persist for many hours and must always be treated in hospital. Sulphonylureas are considered for patients who are not overweight, or in whom metformin is contra-indicated or not tolerated. Several sulphonylureas are available and choice is determined by side effects and the duration of action as well as the patient's age and renal function. The long-acting sulphonylureas chlorpropamide and glibenclamide are associated with a greater risk of hypoglycaemia; for this reason, they should be avoided in the elderly and shorter-acting alternatives, such as gliclazide or tolbutamide, should be used instead. Chlorpropamide also has more side effects than the other sulphonylureas and therefore it is no longer recommended. When the combination of strict diet and sulphonylurea treatment fails other options include combining with metformin reports of increased hazard with this combination remain unconfirmed); combining with acarbose, which may have a small beneficial effect, but flatulence can be a problem; combining with pioglitazone or rosiglitazone combining with bedtime isophane insulin but weight gain and hypoglycaemia can occur. Insulin therapy should be instituted temporarily during intercurrent illness (such as myocardial infarction, coma, infection, and trauma). Sulphonylureas should be omitted on the morning of surgery; insulin is required because of the ensuing hyperglycaemia in these circumstances.

Cautions: Sulphonylureas can encourage weight gain and should be prescribed only if poor control and

symptoms persist despite adequate attempts at dieting; metformin is considered the drug of choice in obese patients. Caution is needed in the elderly and in those with mild to moderate hepatic and renal impairment because of the hazard of hypoglycaemia. The short-acting tolbutamide may be used in renal impairment, as may gliquidone and gliclazide which are principally metabolised in the liver, but careful monitoring of blood-glucose concentration is essential; care is required to choose the smallest possible dose that produces adequate control of blood glucose.

Contra-indications: Sulphonylureas to be avoided if possible in severe hepatic and renal impairment and in porphyria They should not be used in women who breast-feed their babies and insulin therapy to be substituted during Pregnancy Sulphonylureas are contra-indicated in the presence of ketoacidosis.

Side Effects: of sulphonylureas are generally mild and infrequent and include gastro-intestinal disturbances such as nausea, vomiting, diarrhoea and constipation. Chlorpropamide has appreciably more side effects, mainly because of its very prolonged duration of action and the consequent hazard of hypoglycaemia and it should no longer be used. It may also cause facial flushing after drinking alcohol; this effect does not normally occur with other sulphonylureas. Chlorpropamide may also enhance antidiuretic hormone secretion and very rarely cause hyponatraemia (hyponatraemia is also reported with glimepiride and glipizide).

Sulphonylureas can occasionally cause a disturbance in liver function, which may rarely lead to cholestatic jaundice, hepatitis and hepatic failure. Hypersensitivity reactions can occur, usually in the first 6–8 weeks of therapy, they consist mainly of allergic skin reactions which progress rarely to erythema multiforme and exfoliative dermatitis, fever and jaundice; photosensitivity has rarely been reported with chlorpropamide and glipizide. Blood disorders are also rare but may include leucopenia, thrombocytopenia, agranulocytosis, pancytopenia, haemolytic anaemia, and aplastic anaemia.

GLICLAZIDE MR

Indications: type 2 diabetes mellitus
Cautions: Sulfonylureas can encourage weight gain and should be prescribed only if poor control and symptoms persist despite adequate attempts at dieting; Caution is needed in the elderly and in patients with G6PD deficiency.
Contra-indications: Sulfonylureas should be avoided where possible in acute porphyria but Sulfonylureas are contra-indicated in the presence of ketoacidosis.
Hepatic impairment: Sulfonylureas should be avoided or a reduced dose should be used in severe hepatic impairment, because there is an increased risk of hypoglycaemia. Jaundice may occur.
Renal impairment: Sulfonylureas should be used with care in those with mild to moderate renal impairment, because of the hazard of hypoglycaemia; they should be avoided where possible in severe renal impairment. Glipizide should also be avoided if the patient has both renal and hepatic impairment. If necessary, the short-acting drug tolbutamide can be used in renal impairment, as can gliclazide which is principally metabolised in the liver, but careful monitoring of blood-glucose concentration is essential; care is required to use the lowest dose that adequately controls blood glucose.
Pregnancy: The use of sulfonylureas in Pregnancy should generally be avoided because of the risk of neonatal hypoglycaemia; however, glibenclamide can be used during the second and third trimesters of pregnancy in women with gestational diabetes.
Breast-feeding: The use of sulfonylureas in breast-feeding***:*** should be avoided because there is a theoretical possibility of hypoglycaemia in the infant.
Side Effects: of sulfonylureas are generally mild and infrequent and include gastro-intestinal disturbances such as nausea, vomiting, diarrhoea, and constipation. Sulfonylureas can occasionally cause a disturbance in liver function, which may rarely lead to cholestatic jaundice, hepatitis, and hepatic failure. Hypersensitivity reactions can occur, usually in the first 6–8 weeks of therapy. They consist mainly of allergic skin reactions which progress rarely to erythema multiforme and exfoliative dermatitis, fever, and jaundice; Blood

disorders are also rare but may include leucopenia, thrombocytopenia, agranulocytosis, pancytopenia, haemolytic anaemia, and aplastic anaemia.
Dose: Initially, 40–80 mg daily, adjusted according to response; up to 160 mg as a single dose, with breakfast; higher doses divided; max. 320 mg daily

- *Diamicron MR 60mg*

GLIMEPIRIDE

Indications: Type 2 diabetes mellitus
Cautions: Sulfonylureas can encourage weight gain and should be prescribed only if poor control and symptoms persist despite adequate attempts at dieting; metformin is considered the drug of choice in obese patients. Caution is needed in the elderly and in patients with G6PD deficiency.
Contra-indications: Sulfonylureas should be avoided where possible in acute porphyria but glimepiride are thought to be safe. Sulfonylureas are contra-indicated in the presence of ketoacidosis.
Hepatic impairment: Sulfonylureas should be avoided or a reduced dose should be used in severe hepatic impairment, because there is an increased risk of hypoglycaemia. Jaundice may occur.
Renal impairment: Sulfonylureas should be used with care in those with mild to moderate renal impairment, because of the hazard of hypoglycaemia; they should be avoided where possible in severe renal impairment. care is required to use the lowest dose that adequately controls blood glucose.
Pregnancy: The use of sulfonylureas in pregnancy should generally be avoided because of the risk of neonatal hypoglycaemia.
Breast-feeding: The use of sulfonylureas.in breast-feeding***:*** should be avoided because there is a theoretical possibility of hypoglycaemia in the infant.
Side Effects: sulfonylureas are generally mild and infrequent and include gastro-intestinal disturbances such as nausea, vomiting, diarrhoea, and constipation. Hyponatraemia has been reported with glimepiride and glipizide.
Sulfonylureas can occasionally cause a disturbance in liver function, which may rarely lead to cholestatic

jaundice, hepatitis, and hepatic failure. Hypersensitivity reactions can occur, usually in the first 6–8 weeks of therapy. They consist mainly of allergic skin reactions which progress rarely to erythema multiforme and exfoliative dermatitis, fever, and jaundice; photosensitivity has rarely been reported with glipizide. Blood disorders are also rare but may include leucopenia, thrombocytopenia, agranulocytosis, pancytopenia, haemolytic anaemia, and aplastic anaemia.
Dose: Initially 1 mg daily, adjusted according to response in 1-mg steps at 1–2 week intervals; usual max. 4 mg daily (exceptionally, up to 6 mg daily may be used); taken shortly before or with first main meal.

- *Amaryl 2mg Tablets*

INSULIN & HUMAN INSULIN ANALOGUES

Insulin plays a key role in the regulation of carbohydrate, fat and protein metabolism. There are 3 main types of insulin preparations***:***
Those of short duration which have a relatively rapid onset of action, namely, soluble insulin, insulin lispro and insulin aspart.
Those with an intermediate action, e.g. isophane insulin and insulin zinc suspension.
Those whose action is slower in onset and; asts for long periods e.g. insulin zinc suspension.
The human insulin analogues, insulin aspart, insulin glulisine, and insulin lispro have a faster onset and shorter duration of action than soluble insulin; as a result, compared to soluble insulin, fasting and pre-prandial blood-glucose concentration is a little higher, postprandial blood-glucose concentration is a little lower, and hypoglycaemia occurs slightly less frequently.
Subcutaneous injection of insulin analogues may be convenient for those who wish to inject shortly before or, when necessary, shortly after a meal. They may also help those prone to pre-lunch hypoglycaemia and those who eat late in the evening and are prone to nocturnal hypoglycaemia. They may also be administered by subcutaneous infusion.
Soluble insulin is the most appropriate form of insulin for use in diabetic emergencies e.g. diabetic ketoacidosis and

at the time of surgery. It can be given intravenously and intramuscularly, as well as subcutaneously.

INSULIN ASPART

Indications: diabetes mellitus
Hepatic impairment: Insulin requirements may be decreased in patients with hepatic impairment.
Renal impairment: Insulin requirements may decrease in patients with renal impairment and therefore dose reduction may be necessary. The compensatory response to hypoglycaemia is impaired in renal impairment.
Pregnancy and Breast-feeding: During Pregnancy and breast-feeding, insulin requirements may alter and doses should be assessed frequently by an experienced diabetes physician. The dose of insulin generally needs to be increased in the second and third trimesters of pregnancy. The short-acting insulin analogues, insulin aspart and insulin lispro, are not known to be harmful, and may be used during Pregnancy and breast-feeding. Evidence of the safety of long-acting insulin analogues in Pregnancy is limited, therefore isophane insulin is recommended where longer-acting insulins are needed; insulin detemir may also be considered.
Side Effects: transient oedema; local reactions and fat hypertrophy at injection site; rarely hypersensitivity reactions including urticaria, rash; overdose causes hypoglycaemia**.**
Dose: By subcutaneous injection, adult and child over 2 years, immediately before meals or when necessary shortly after meals, according to requirements
By subcutaneous infusion, or intravenous injection, or intravenous infusion, adult and child over 2 years, according to requirements.

- *NovoMix 30 Injection, biphasic insulin aspart (recombinanthuman insulin analogue), 30% insulin aspart, 70%insulin aspart protamine, 100 units/ml*

INSULIN DETEMIR

Indications: diabetes mellitus
Hepatic impairment: Insulin requirements may be decreased in patients with hepatic impairment.

Renal impairment: Insulin requirements may decrease in patients with renal impairment and therefore dose reduction may be necessary. The compensatory response to hypoglycaemia is impaired in renal impairment.
Pregnancy and Breast-feeding: During Pregnancy and breast-feeding, insulin requirements may alter and doses should be assessed frequently by an experienced diabetes physician. The dose of insulin generally needs to be increased in the second and third trimesters of pregnancy. The short-acting insulin analogues, insulin aspart and insulin lispro, are not known to be harmful, and may be used during Pregnancy and breast-feeding. Evidence of the safety of long-acting insulin analogues in Pregnancy is limited, therefore isophane insulin is recommended where longer-acting insulins are needed; insulin detemir may also be considered.
Side Effects: transient oedema; local reactions and fat hypertrophy at injection site; rarely hypersensitivity reactions including urticaria, rash; overdose causes hypoglycaemia
Dose: By subcutaneous injection, adult and child over 2 years, according to requirements.

- *Levemir Injection, (recombinant human insulin analogue) 100 units/ml*

INSULIN GLULISINE

Indications: *diabetes mellitus*
Hepatic impairment: Insulin requirements may be decreased in patients with hepatic impairment.
Renal impairment: Insulin requirements may decrease in patients with renal impairment and therefore dose reduction may be necessary. The compensatory response to hypoglycaemia is impaired in renal impairment.
Pregnancy* and *Breast-feeding: During Pregnancy and breast-feeding, insulin requirements may alter and doses should be assessed frequently by an experienced diabetes physician. The dose of insulin generally needs to be increased in the second and third trimesters of pregnancy. The short-acting insulin analogues, insulin aspart and insulin lispro, are not known to be harmful, and may be used during Pregnancy and breast-feeding. Evidence of the safety of long-acting insulin analogues in Pregnancy is limited, therefore isophane insulin is recommended

where longer-acting insulins are needed; insulin detemir may also be considered.
Side Effects: transient oedema; local reactions and fat hypertrophy at injection site; rarely hypersensitivity reactions including urticaria, rash; overdose causes hypoglycaemia
Dose: By subcutaneous injection, adult and child over 6 years, immediately before meals or when necessary shortly after meals, according to requirements
By subcutaneous infusion or intravenous infusion adult and child over 6 years, according to requirements.

- *Apidra Injection, (recombinant human insulin analogue) 100 units/ml*

BIPHASIC INSULIN LISPRO

Indications: diabetes mellitus
Hepatic impairment: Insulin requirements may be decreased in patients with hepatic impairment.
Renal impairment: Insulin requirements may decrease in patients with renal impairment and therefore dose reduction may be necessary. The compensatory response to hypoglycaemia is impaired in renal impairment.
Pregnancy* and *Breast-feeding: During Pregnancy and breast-feeding, insulin requirements may alter and doses should be assessed frequently by an experienced diabetes physician. The dose of insulin generally needs to be increased in the second and third trimesters of pregnancy. The short-acting insulin analogues, insulin aspart and insulin lispro, are not known to be harmful, and may be used during Pregnancy and breast-feeding. Evidence of the safety of long-acting insulin analogues in Pregnancy is limited, therefore isophane insulin is recommended where longer-acting insulins are needed; insulin detemir may also be considered
Side Effects: transient oedema; local reactions and fat hypertrophy at injection site; rarely hypersensitivity reactions including urticaria, rash; overdose causes hypoglycaemia
Dose: By subcutaneous injection, up to 15 minutes before or soon after a meal, according to requirements.

- *Humalog Injection, (recombinant human insulin analogue) 100 units/ml*

ISOPHANE INSULIN, HUMAN (NPH)

This is an intermediate-acting insulin.
ISOPHANE INSULIN
(Isophane Insulin Injection; Isophane Protamine Insulin Injection; Isophane Insulin (NPH)—intermediate acting) Additional information interactions (Insulin); renal impairment; pregnancy.
A sterile suspension of bovine or porcine insulin or of human insulin in the form of a complex obtained by the addition of protamine sulphate or another suitable protamine
Indications: diabetes mellitus
Cautions: reduce dose in renal impairment.
Side Effects: see under Insulin; protamine may cause allergic reactions
Dose: by SC injection according to requirements. It has an onset of action of approximately 1-2 hours, a maximal effect at 4-12 hours, and a duration of 16-35 hours.
It can be mixed with soluble insulin in the syringe.

- *Humulin-I Injection100 units/ml*
- *Insulatard Injection100 units*

INSULIN NEUTRAL HUMAN

This is a short-acting insulin.
Indications: diabetes mellitus; diabetic ketoacidosis
Hepatic impairment: Insulin requirements may be decreased in patients with hepatic impairment.
Renal impairment: Insulin requirements may decrease in patients with renal impairment and therefore dose reduction may be necessary. The compensatory response to hypoglycaemia is impaired in renal impairment.
Pregnancy* and *Breast-feeding: During Pregnancy and breast-feeding, insulin requirements may alter and doses should be assessed frequently by an experienced diabetes physician. The dose of insulin generally needs to be increased in the second and third trimesters of pregnancy. The short-acting insulin analogues, insulin aspart and insulin lispro, are not known to be harmful, and may be used during Pregnancy and breast-feeding. Evidence of the safety of long-acting insulin analogues in Pregnancy is limited, therefore isophane insulin is recommended

where longer-acting insulins are needed; insulin detemir may also be considered.
Side Effects: transient oedema; local reactions and fat hypertrophy at injection site; rarely hypersensitivity reactions including urticaria, rash; overdose causes hypoglycaemia
Dose: By subcutaneous, intramuscular or intravenous injection or intravenous infusion, according to requirements.

- *Actrapid Injection, 100 units/ml.*
  Note : *Not recommended for use in subcutaneous insulin. infusion pumps—may precipitate in catheter* or *needle*
- *Humulin S Injection, 100 units/ml*
- *Insuman Rapid Injection, 100 units/ml,*
  Note : *Not recommended for use in subcutaneous insulin infusion pumps*

INSULIN GLARGINE

This is a long acting human insulin analogue prepared by recombinant technology.
Indications: *diabetes mellitus*
Hepatic impairment: Insulin requirements may be decreased in patients with hepatic impairment.
Renal impairment: Insulin requirements may decrease in patients with renal impairment and therefore dose reduction may be necessary. The compensatory response to hypoglycaemia is impaired in renal impairment.
Pregnancy* and *Breast-feeding: During Pregnancy and breast-feeding, insulin requirements may alter and doses should be assessed frequently by an experienced diabetes physician. The dose of insulin generally needs to be increased in the second and third trimesters of pregnancy. The short-acting insulin analogues, insulin aspart and insulin lispro, are not known to be harmful, and may be used during Pregnancy and breast-feeding. Evidence of the safety of long-acting insulin analogues in Pregnancy is limited, therefore isophane insulin is recommended where longer-acting insulins are needed; insulin detemir may also be considered.
Side Effects: transient oedema; local reactions and fat hypertrophy at injection site; rarely hypersensitivity

reactions including urticaria, rash; overdose causes hypoglycaemia
Dose: By subcutaneous injection, adult and child over 2 years, according to requirements.

- *Insulin Glargine. Human 300 Units/pen*
- *Lantus Injection 100 units/ml*

METFORMIN HCL

This is a biguanide
Indications: maturity-onset diabetes especially when this accompanies obesity (BMI > 25) and insulin resistance, Women with Polycystic ovary syndrome and a body mass index above 25 may be given metformin when other therapy has failed to produce results.
Cautions: congestive heart failure, hepatic and renal disease, acidosis, severe infections, gangrene, pregnancy; before or after surgery.
Contra-indications: renal impairment; ketoacidosis; withdraw if tissue hypoxia likely (e.g. sepsis, respiratory failure; recent mycardial infarction, hepatic impairment); use of iodine containing X-ray contrast media; pregnancy and breast feeding.
Side Effects: lactic acidosis in those with impaired liver or kidney function.
Gastrointestinal***:*** diarrhea, cramps, nausea and vomiting.
Dose: Initially 500 mg with breakfast for 1 week followed by 500 mg with breakfast and evening meal for 1 week then 500 mg with breakfast, lunch and evening meal. Max 2 g daily in divided doses.
Polycystic ovary syndrome***:*** Initially 500 mg with breakfast for 1 week followed by 500 mg with breakfast and evening meal for 1 week then 1.5 to 1.7 g daily in 2-3 divided doses.

- *Glucophage Tablets 500 mg & 1000mg.*

LIRAGLUTIDE

Indications: diabetes mellitus
Cautions: discontinue if symptoms of acute pancreatitis (persistent, severe abdominal pain)
Contra-indications: ketoacidosis; inflammatory bowel disease; diabetic gastroparesis
Hepatic impairment: avoid—limited experience

Renal impairment: avoid if eGFR less than 60 ml/minute/1.73 m^2—limited experience
Pregnancy: avoid—toxicity in animal studies
Breast-feeding: avoid—no information available
Side Effects: gastro-intestinal disturbances including nausea, vomiting, constipation, diarrhoea, dyspepsia, abdominal pain and distension, flatulence, gastritis, gastro-oesophageal reflux disease, decreased appetite; headache, dizziness, fatigue; fever, bronchitis, nasopharyngitis; hypoglycaemia; injection site reactions; also reported acute pancreatitis, thyroid neoplasm, goitre, increased blood calcitonin, angioedema
Dose: By subcutaneous injection, adult over 18 years, initially 0.6 mg once daily, increased after at least 1 week to 1.2 mg once daily, further increased if necessary after an interval of at least 1 week to max. 1.8 mg once daily Maintenance,

- *Victoza Injection 6 mg/ml*

OTHER ANTIDIABETIC DRUGS

SAXAGLIPTIN

Indications: diabetes mellitus
Cautions: Elderly; determine renal function before treatment and periodically thereafter; discontinue if symptoms of acute pancreatitis (persistent, severe abdominal pain).
Contra-indications: history of serious hypersensitivity to dipeptidylpeptidase-4 inhibitors.
Hepatic impairment: Use with caution in moderate impairment; avoid in severe impairment
Renal impairment: Reduce dose to 2.5 mg once daily in moderate to severe impairment; use with caution in severe impairment.
Pregnancy: Avoid unless essential—toxicity in *animal* studies
Breast-feeding: Avoid—present in milk in *animal* studies
Side Effects: Vomiting, dyspepsia, gastritis; peripheral oedema; headache, dizziness, fatigue; upper respiratory tract infection, urinary tract infection, gastroenteritis, sinusitis, nasopharyngitis; hypoglycaemia, myalgia; less dyslipidaemia, hypertriglyceridaemia, pancreatitis,

erectile dysfunction, arthralgia, hypersensitivity reactions (including anaphylaxis); also reported rash
Dose: ADULT over 18 years, 5 mg once daily

- *Onglyza 2.5 mg tablets, 2.5 mg*

SITAGLIPTIN

Indications: diabetes mellitus
Cautions: discontinue if symptoms of acute pancreatitis (persistent, severe abdominal pain).
Contra-indications: ketoacidosis
Renal impairment: reduce dose to 50 mg once daily if eGFR 3050 ml/minute/1.73 m^2; reduce dose to 25 mg once daily if eGFR less than 30 ml/minute/1.73 m^2
Pregnancy: avoid—toxicity in animal studies.
Breast-feeding: avoid—present in milk in animal studies
Side Effects: gastro-intestinal disturbances; peripheral oedema; upper respiratory tract infection, nasopharyngitis; pain; less commonly dry mouth, anorexia, headache, drowsiness, dizziness, hypoglycaemia, osteoarthritis; pancreatitis, rash, cutaneous vasculitis, and Stevens-Johnson syndrome.
Dose: ADULT over 18 years, 100 mg once daily.
Note: ***Dose*** of concomitant sulfonylurea or insulin may need to be reduced

- *Januvia Tablets, 100 mg*

VILDAGLIPTIN

Indications: diabetes mellitus
Cautions: monitor liver function; manufacturer advises avoid in severe heart failure—no information available; discontinue if symptoms of acute pancreatitis (persistent, severe abdominal pain).
Liver toxicity*:* Rare reports of liver dysfunction; monitor liver function before treatment and every 3 months for first year and periodically thereafter; advise patients to seek prompt medical attention if symptoms such as nausea, vomiting, abdominal pain, fatigue, and dark urine develop; discontinue if jaundice or other signs of liver dysfunction occur.
Contra-indications: Ketoacidosis
Hepatic impairment: Avoid

Renal impairment: Reduce dose to 50 mg once daily if eGFR less than 50 ml/minute/1.73 m^2
Pregnancy: avoid—toxicity in animal studies
Breast-feeding: avoid—present in milk in animal studies
***Side Effects*:** nausea, peripheral oedema, headache, tremor, asthenia, dizziness; less commonly constipation, hypoglycaemia, arthralgia; rarely hepatic dysfunction. very rarely nasopharyngitis, upper respiratory tract infection; also reported pancreatitis, exfoliative and bullous skin reactions.
Dose: ADULT over 18 years, monotherapy, 50 mg twice daily
ADULT over 18 years, dual therapy in combination with metformin or pioglitazone, 50 mg twice daily; dual therapy in combination with a sulfonylurea, 50 mg daily in the morning
ADULT over 18 years, triple therapy in combination with metformin and a sulfonylurea, 50 mg twice daily
ADULT over 18 years, in combination with insulin (with or without metformin), 50 mg twice daily
Dose of concomitant sulfonylurea or insulin may need to be reduced

- *Galvus Tablets, 50 mg*

TREATMENT OF HYPOGLYCAEMIA

Initially glucose 10–20 g is given by mouth either in liquid form or as granulated sugar or sugar lumps. Approximately 2 teaspoons sugar or 3 sugar lumps provide 10 g of glucose.
Unconsciousness due to hypoglycaemia is an emergency, if sugar cannot be given by mouth, glucagon can be given by injection. Carbohydrates to restore liver glycogen should be given as soon as possible; in chronic hypoglycaemia glucagon is not appropriate treatment.
Glucagon may be issued to close relatives of insulin-treated patients for emergency use in hypoglycaemic attacks. In hospitalised patients who are treated with insulin, it is often advisable to prescribe glucagon on PRN basis, so that the nurses may give it rapidly during an hypoglycaemic emergency. If not effective in 10 minutes intravenous glucose should be given.
50 ml of glucose intravenous infusion 20% may be given intravenously into a large vein through a large-gauge

needle as an alternative therapy, care is required since this concentration is irritant especially if extravasation occurs. Alternatively, 25 ml of glucose intravenous infusion 50% may be given, but this higher concentration is more irritant and viscous making administration difficult. Glucose intravenous infusion 10% may also be used but larger volumes are needed. Close monitoring is necessary in the case of an overdose with a long-acting insulin because further administration of glucose may be required. Patients with hypoglycaemia due to oral antidiabetic drugs should be transferred to hospital, as the hypoglycaemic effects of these drugs may persist for many hours.

DIAZOXIDE

Indications: chronic intractable hypoglycaemia
Cautions: impaired cardiac or cerebral circulation; heart failure; aortic coarctation; aortic stenosis; arteriovenous shunt; monitor blood pressure; hyperuricaemia; during prolonged use monitor white cell and platelet count
Renal impairment: dose reduction may be required
Pregnancy: use only if essential; alopecia and hypertrichosis reported in neonates with prolonged use; may inhibit uterine activity during labour
Breast feeding: manufacturer advises avoid—no information available
Side Effects: nausea, vomiting, abdominal pain, diarrhoea, constipation, ileus, pancreatitis, anorexia (prolonged use), taste disturbance, bleeding, heart failure, hypotension, pulmonary hypertension, dyspnea, extrapyramidal effects, headache, dizziness, galactorrhoea, hyperglycaemia, decreased libido, leucopenia, thrombocytopenia, anaemia, eosinophilia, hyperosmolar non-ketotic coma, raised serum creatinine and urea, reversible nephritic syndrome, sodium and fluid retention, hyperuricaemia (prolonged use), musculoskeletal pain, visual disturbances, transient cataracts, lacrimation, tinnitus, hypertrichosis, pruritus, dermatitis, lichenoid eruption
Dose: By mouth, ADULT, initially 5 mg/kg daily in 2–3 divided doses, then adjusted according to response
Maintenance, usual maintenance dose 3–8 mg/kg daily in 2–3 divided doses

- *Eudemine 50 mg Tablets*

GLUCAGON HCl

Indications: acute hypoglycemia.
Cautions: ineffective in chronic hypoglycemia, starvation and adrenal insufficiency; insulinoma; glucagonoma, breast feeding.
Contra-indications: phaeochromocytoma.
Side Effects: nausea, vomiting, rarely hypersensitivity reactions, abdominal pain, hypokalaemia, hypotension.
Dose: by SC, IM, or IV injection, adults and children over 8 years or body-weight over 25 kg, 1 mg; CHILDREN less than 8 years or body-weight below 25 kg, 500 mcg. if no response within 10 minutes intravenous glucose must be given.
Note: 1 unit of glucagon = 1 mg of glucagon or glucagon hydrochloride.

- *Glucagon Injection 1 Unit/Vial.*

ANTI-THYROID DRUG

CARBIMAZOLE

Indications: hyperthyroidism, thyrotoxicosis.
Cautions: pregnancy, breast-feeding; tracheal obstruction; large goiter; liver disorders. Doctors should instruct patients about important symptoms and signs of bone marrow suppression induced by carbimazole and the need to stop treatment promptly and do the following***:***
Patient to report symptoms and signs suggestive of infection, especially sore throat immediately.
To perform white blood cell count if there is any clinical evidence of infection. Stop Carbimazole immediately if there is clinical or laboratory evidence of neutropenia.
Dose: 15 to 40 mg daily; a larger dose may be required occasionally. This dose is continued until the patient becomes euthyroid, usually after 4 to 8 weeks and the dose is then gradually reduced to a maintenance dose of 5 to 15 mg. Duration of therapy is given for 12 to 18 months. Children to be treated by specialist with initial dose of carbimazole of 250 mcg/kg three times daily, and to be adjusted according to response;

Side Effects: Nausea, mild gastro-intestinal disturbances, headache, rashes and pruritus, arthralgia; rarely myopathy, alopecia, bone marrow suppression (including pancytopenia and agranulocytosis), jaundice
Breast feeding: The lowest effective dose of the drug should be used as the amount in milk may be sufficient to affect neonatal thyroid function. Carbimazole appears in breast milk but this does not preclude breast-feeding***:*** as long as neonatal development is closely monitored and the lowest effective dose is used.

- *Neomercazole Tablets 5 mg*

PROPYLTHIOURACIL

Indications: Hyperthyroidism; thyrotoxicosis.
Cautions: same as for carbimazole. Also hepatic and renal impairment.
Side Effects: same as for carbimazole***:*** also leucopenia, rarely cutaneous vasculitis, thrombocytopenia, aplastic anaemia, hypoprothrombinemia, hepatitis, encephalopathy, hepatic necrosis, nephritis, lupus erythematous like syndrome.
Dose: 100-200mg 3 times daily. Maintenance dose, 50-150 mg daily. Propylthiouracil is given in a dose of 200 to 400 mg daily in adults and this dose is maintained until the patient becomes euthyroid; the dose may then be gradually reduced to a maintenance dose of 50 to 150 mg daily.
Antithyroid drugs only need to be given once daily because of their prolonged effect on the thyroid. Over-treatment can result in the rapid development of hypothyroidism and should be avoided particularly during pregnancy because it can cause fetal goitre

- *Propylthiouracil Tablets 50 mg.*

STEROIDS

DEXAMETHASONE

Indications: suppression of inflammatory and allergic disorders; shock; diagnosis of Cushing's syndrome; congenital adrenal hyperplasia; cerebral oedema; inflammation associated with malignancy; croup; nausea and vomiting with chemotherapy; rheumatic disease; eye

Cautions: pregnancy and breast-feeding. adrenal suppression and infection, children and adolescents (growth retardation possibly irreversible), elderly (use with supervision particularly on long-term treatment); if history of tuberculosis (or X-ray changes) use with frequent monitoring, hypertension, recent myocardial infarction (rupture reported), congestive heart failure, liver failure, renal impairment, diabetes mellitus including family history, osteoporosis (post-menopausal women at special risk), glaucoma (including family history), corneal perforation, severe affective disorders (particularly if history of steroid-induced psychosis), epilepsy, peptic ulcer, hypothyroidism, history of steroid myopathy; pregnancy; breast feeding.
Contra-indications: systemic infection; avoid live virus vaccines in those receiving immunosuppressive doses (serum antibody response diminished)
Side Effects: use lowest effective dose for minimum period possible to minimise side effects; gastro-intestinal effects include dyspepsia, peptic ulceration (with perforation), abdominal distension, acute pancreatitis, oesophageal ulceration and candidiasis; musculoskeletal effects include proximal myopathy, osteoporosis, vertebral and long bone fractures, avascular osteonecrosis, tendon rupture; endocrine effects include adrenal suppression, menstrual irregularities and amenorrhoea, Cushing's syndrome if used in high doses, usually reversible on withdrawal, hirsutism, weight gain, negative nitrogen and calcium balance, increased appetite; increased susceptibility to and severity of infection; neuropsychiatric effects include euphoria, psychological dependence, depression, insomnia, increased intracranial pressure with papilloedema in children (usually after withdrawal), psychosis and aggravation of schizophrenia, aggravation of epilepsy; ophthalmic effects include glaucoma, papilloedema, posterior subcapsular cataracts, corneal or scleral thinning and exacerbation of ophthalmic viral or fungal disease; other side effects: include impaired healing, skin atrophy, bruising, striae, telangiectasia, acne, myocardial rupture following recent myocardial infarction, fluid and electrolyte disturbance, leucocytosis, hypersensitivity reactions (including anaphylaxis), thromboembolism,

nausea, malaise, hiccups; perineal irritation may follow intravenous administration of the phosphate ester
Drug Interactions: with Aspirin, NSAI drugs, anticoagulant, diuretics estrogen phenytoin, rifampicin, sulphonyleurea resulting in side effects or altered effectiveness of the medication.
Dose: By mouth, usual range 0.5–10 mg daily; CHILD 10–100 mcg/kg daily; By intramuscular injection or slow intravenous injection or infusion (as dexamethasone phosphate), initially 0.5–24 mg; CHILD 200–400 mcg/kg daily
Cerebral oedema associated with malignancy (as dexamethasone phosphate), by intravenous injection, 10 mg initially, then 4 mg by intramuscular injection every 6 hours as required for 2–4 days then gradually reduced and stopped over 5–7 days
Adjunctive treatment of bacterial meningitis, (starting before or with first dose of antibacterial treatment, as dexamethasone phosphate), by intravenous injection, 10 mg every 6 hours for 4 days; CHILD 150 mcg/kg every 6 hours for 4 days
Dexamethasone 1 mg ≡ dexamethasone phosphate 1.2 mg ≡ dexamethasone sodium phosphate 1.3 mg

- *Decadron Tablets 0.5 mg, 4 mg*
- *Decadron Injection 4 mg/ml -2 ml Ampoules*
- *Decadron Elixir 0.5 mg/ 5 ml*

FLUDROCORTISONE ACETATE

Indications: mineralocorticoid replacement in adrenocortical insufficiency; adrenal hyperplasia (given with hydrocortisone)
Cautions: diabetes mellitus, tuberculosis, and liver disease.
Contra-indications: pregnancy and breast feeding.
Side Effects: hypertension; sodium and water retention, potassium loss; Irritation, stomach upset, vomiting, headache, dizziness, insomnia, restlessness, depression, anxiety, acne, increased hair growth, easy bruising, irregular or absent menstrual periods, skin rash, swollen face and ankles, vision problems, cold or infection that last a long time, muscle weakness, melena, DM,

Dose: adrenocortical insufficiency, 50-300 mcg daily Child, 5 mcg/kg daily Adrenal hyperplasia, 50-100 (rarely 150) mcg daily.

- *Florinef Tablets 100 mcg*

HYDROCORTISONE

Indications: adrenocortical insufficiency; suppression of inflammatory and allergic disorders; anaphylactic shock; and angioedema; inflammatory bowel disease and hemorrhoids; rheumatic disease; eye; skin.
Cautions: kidney disease; liver disease; hypertension; sodium and water retention, potassium loss; heart disease; ulcerative colitis, diverticulitis, or stomach ulcers; hypothyroidism; a psychiatric condition; myasthenia gravis; diabetes mellitus; osteoporosis; pregnancy and breast feeding
Contra-indications: In serious bacterial, viral, or fungal infection. Hydrocortisone weakens the body's immune response.
Side Effects: upset stomach, vomiting, headache, dizziness, insomnia, restlessness, irregular or absent menstrual periods, skin rash, swollen face, lower legs, or ankles, vision problems, cold or infection that lasts a long time, muscle weakness, Melena
Drug Interactions: Warfarin, Aspirin, OCP, NSAI Drugs
Dose: by IM or slow IV injection or infusion, 100-500 mg 3-4 times daily in 24 hours or as required.
By mouth, replacement therapy, 20-30 mg daily in divided doses.
Child, 10-30 mg.
Child, by slow IV injection, up to 1 year, 25 mg;
1-5 years, 50 mg;
6-12 years, 100 mg.
High doses should be given in severe shock because the risk of complications is negligible with short-term therapy.

- *Solu-Cortef Injection 100 mg/Vial.*
- *Hydrocortisone Tablets 10 mg*

METHYLPREDNISOLONE ACETATE

Indications: suppression of inflammatory and allergic disorders; cerebral oedema associated with malignancy; rheumatic disease

Cautions: same as for dexamethasone. In addition, rapid intravenous administration may cause cardiovascular collapse.

Contra-indications: as for dexamethasone

Side Effects: same as for dexamethasone

Dose: By Mouth 2 – 40 mg daily.

By IM or slow IV injection***:*** initially 10 – 500 mg.

Graft rejection, up to 1 g daily by intravenous infusion for up to 3 days

- *Depo-Medrol Injection 40 mg/ml, For IM Use.*
- *Solu-Medrol 1000 mg Vial, For IV Use..*

PREDNISOLONE

Indications: suppression of inflammatory and allergic disorders; inflammatory bowel disease; asthma; immunosuppression; rheumatic disease

Cautions: adrenal suppression and infection, children and adolescents (growth retardation possibly irreversible), elderly (close supervision required particularly on long-term treatment); frequent monitoring required if history of tuberculosis (or X-ray changes), hypertension, recent myocardial infarction (rupture reported), congestive heart failure, liver failure, renal impairment, diabetes mellitus including family history, osteoporosis (post-menopausal women at special risk), glaucoma (including family history), corneal perforation, severe affective disorders (particularly if history of steroid-induced psychosis), epilepsy, peptic ulcer, hypothyroidism, history of steroid myopathy; pregnancy

Contra-indications: systemic infection (unless specific antimicrobial therapy given); avoid live virus vaccines in those receiving immunosuppressive doses (serum antibody response diminished)

Side Effects: minimised by using lowest effective dose for minimum period possible;

gastro-intestinal effects include dyspepsia, peptic ulceration (with perforation), abdominal distension, acute pancreatitis, oesophageal ulceration and candidiasis;

musculoskeletal effects include proximal myopathy, osteoporosis, vertebral and long bone fractures, avascular osteonecrosis, tendon rupture; endocrine effects include adrenal suppression, menstrual irregularities and amenorrhoea, Cushing's syndrome (with high doses, usually reversible on withdrawal), hirsutism, weight gain, negative nitrogen and calcium balance, increased appetite; increased susceptibility to and severity of infection; neuropsychiatric effects include euphoria, psychological dependence, depression, insomnia, increased intracranial pressure with papilloedema in children (usually after withdrawal), psychosis and aggravation of schizophrenia, aggravation of epilepsy; ophthalmic effects include glaucoma, papilloedema, posterior subcapsular cataracts, corneal or scleral thinning and exacerbation of ophthalmic viral or fungal disease; other side effects: include impaired healing, skin atrophy, bruising, striae, telangiectasia, acne, myocardial rupture following recent myocardial infarction, fluid and electrolyte disturbance, leucocytosis, hypersensitivity reactions (including anaphylaxis), thromboembolism, nausea, malaise, hiccups

Dose: by mouth, initially up to 10-20 mg daily in divided doses may increase up to 60mg daily in severe disease. Maintenance, 2.5-15 mg daily but higher doses may be needed; to be taking after food. cushingoid side effects; is more likely with doses above 7.5 mg daily

By intramuscular injection, prednisolone acetate, 25–100 mg once or twice weekly

- *Prednisolone Tablets, 1 mg, 5 mg, 20 mg*
- *Prednisolone 15mg/5ml syrup*
- *Prednisolone 0.2% retension enema*

HORMONES

CHORIONIC GONADOTROPIN

This is an anterior pituitary hormone.
(Human Chorionic Gonadotropin; HCG)

A preparation of a glycoprotein fraction secreted by the placenta and obtained from the urine of pregnant women having the action of the pituitary luteinising hormone

Indications: female primary or secondary amenorrhoea, post-partum amenorrhoea, sterility.

In the male it is used for cryptorchidism, delayed puberty, hypogonadism, infertility.
Cautions: asthma, epilepsy, migraine cardiac or renal impairment, prepubertal boys (risk of premature epiphyseal closure or precocious puberty)
Contra-indications: androgen-dependent tumours
Side Effects: oedema (particularly in males—reduce dose), headache, tiredness, mood changes, multiple pregnancy, gynaecomastia, local reactions; ovarian hyperstimulation may be aggravated.
Dose: by IM or SC injection; usual dose is 500-5000 units twice weekly.

- *Pregnyl Injection 1500, 5000 Units*

CLOMIPHENE CITRATE

This is an anti-estrogens.
They induce gonadotropin release by occupying oestrogen receptors in the hypothalamus, thereby interfering with feedback mechanisms; chorionic gonadotropin is sometimes used as an adjunct. Patients should be informed that there is a risk of multiple pregnancy (rarely more than twins).
Indications: female infertility due to oligomenorrhoea or secondary amenorrhoea (e.g. associated with polycystic ovarian disease); anovulatory infertility; oligospermia.
Cautions: In polycystic ovary syndrome to be used with caution as cysts may enlarge during treatment, ovarian hyperstimulation syndrome may occur, uterine fibroids, ectopic pregnancy, incidence of multiple births increased, visual symptoms (discontinue and consult ophthalmologist); breast-feeding, clomifene should not normally be used for longer than 6 cycles (increased risk of ovarian cancer)
Contra-indications: ovarian cysts**,** hepatic disease, hormone dependent tumours or undiagnosed abnormal uterine bleeding, pregnancy (to be excluded before initiating treatment)
Side Effects: visual blurring (withdraw), ovarian hyperstimulation (withdraw), hot flushes, abdominal discomfort, occasionally nausea, vomiting, depression, insomnia, breast tenderness, headache, intermenstrual spotting, menorrhagia, endometriosis, convulsions, weight gain, rashes, dizziness, hair loss

Dose: 50 mg daily for 5 days, starting within about 5 days of onset of menstruation (preferably on 2nd day) or at any time (normally preceded by a progestogen-induced withdrawal bleed) if cycles have ceased; second course of 100 mg daily for 5 days may be given in absence of ovulation; most patients who are going to respond will do so to first course; 3 courses should constitute adequate therapeutic trial; long-term cyclical therapy not recommended

- *Clomid 50 mg Tablet*

CONJUGATED ESTROGENS

Indications: menopausal symptoms, senile vaginitis and pruritis vulvae, dysfunctional uterine bleeding, prostatic carcinoma, functional amenorrhoea, hypogenitalism.
Cautions: increase the risk of developing endometrial hyperplasia that may lead to cancer of the lining of the uterus. Taking progestins, with conjugated estrogens lowers the risk of developing this condition. Treatment with conjugated estrogens may increase the risk of heart attack, stroke, breast cancer, and blood clots in the lungs or legs. Because of these risks, conjugated estrogens should be prescribed at the lowest effective dose, for the shortest amount of time necessary.
Contra-indications: Pregnancy; estrogen dependent cancer; history of breast cancer; active thrombophlebitis; active or recent thromboembolic disease; liver disease; untreated endometrial hyperplasia; undiagnosed vaginal bleeding, breast feeding.
Side Effects: nausea, vomiting; abdominal cramps and blotting; weight changes, breast enlargement and tenderness, premenstrual like syndrome; sodium & fluid retention; cholestatic jaundice, glucose intolerance, altered blood lipids- may lead to pancreatitis, rashes & chloasma, changes in libido, depression, mood changes, headache, migraine, dizziness, leg cramps, vaginal candidiasis, contact lenses may irritate.
Drug Interactions: Decrease the effects of warfarin, Rifampin, barbiturates, carbamazepine, griseofulvin phenytoin all increase the elimination of estrogen by enhancing the liver's ability to eliminate estrogens. Use of any of these medications with estrogens may result in a reduction of the beneficial effects of estrogens.

Conversely, drugs such as erythromycin, ketoconazole, itraconazole, and ritonavir, may reduce the elimination of estrogens by the liver as and lead to increased levels of estrogens in the blood.
Dose: menopausal symptoms, postmenopausal osteoporosis, 0.625-1.25 mg daily for 21 days from 5th day of cycle, repeated after 7 days if necessary, reduced to maintenance dose, and if necessary continued on a cyclical basis with a progestogen for 12-14 days per cycle if uterus intact.
Primary amenorrhoea, 1.25-3.75 mg daily in divided doses for 21 days, with a progestogen from 15th to 21 st day.

- *Premarin 1.25 mg Tablets.*

DESMOPRESSIN

This is a posterior pituitary hormone.
Indications: diabetes insipidus; nocturnal enuresis; nocturia diagnostic procedures.
Cautions: heart failure, asthma, epilepsy, migraine; renal impairment, in cardiovascular disease and in hypertension, pregnancy; elderly (avoid for nocturnal enuresis and nocturia in those over 65 years); in cystic fibrosis; In nocturia and nocturnal enuresis limit fluid intake to minimum from 1 hour before dose until 8 hours afterwards; in nocturia periodic blood pressure and weight checks needed to monitor for fluid overload; Hyponatraemic convulsions
Patients being treated for primary nocturnal enuresis should be warned to avoid fluid overload and to stop taking desmopressin during an episode of vomiting or diarrhoea (until fluid balance normal). The risk of hyponatraemic convulsions can also be minimised by keeping to the recommended starting doses and by avoiding concomitant use of drugs which increase secretion of vasopressin (e.g. tricyclic antidepressants)
Contra-indications: cardiac insufficiency and conditions treated with diuretics; psychogenic polydipsia and polydipsia due to alcohol dependence
Side Effects: fluid retention, and hyponatraemia (in more serious cases with convulsions) on administration without restricting fluid intake; headache, nausea, vomiting, abdominal pain, fluid retention and swelling, allergic

reactions, and emotional disturbance in children, epistaxis, nasal congestion, rhinitis may developed with nasal spray

Dose: intranasal, maintenance, 10-20 mcg 1-2 times daily

Child, 5-10 mcg 1-2 times daily.

By mouth (as desmopressin acetate)

Diabetes insipidus, treatment, adult and child initially 300 mcg daily (in 3 divided doses); maintenance, 300–600 mcg daily in 3 divided doses; range 0.2–1.2 mg daily

Primary nocturnal enuresis (if urine concentrating ability normal), adult (under 65 years) and child over 7 years 200 mcg at bedtime, only increased to 400 mcg if lower dose not effective (important*:* see also cautions); withdraw for at least 1 week for reassessment after 3 months. Postoperative polyuria or polydipsia, adjust dose according to urine osmolality. Sublingually (as desmopressin base)

Diabetes insipidus, treatment, adult and child initially 180 mcg daily in 3 divided doses; range 120–720 mcg daily

Primary nocturnal enuresis (if urine concentrating ability normal), adult (under 65 years) and child over 7 years 120 mcg at bedtime, only increased to 240 mcg if lower dose not effective; Polyuria or polydipsia after hypophysectomy, adjust dose according to urine osmolality. Intranasally (as desmopressin acetate)

Diabetes insipidus, diagnosis, adult and child 20 mcg (limit fluid intake to 500 ml from 1 hour before to 8 hours after administration)

Diabetes insipidus, treatment, adult 10–40 mcg daily (in 1–2 divided doses); child 5–20 mcg daily; infants may require lower doses

Primary nocturnal enuresis (if urine concentrating ability normal), adult (under 65 years) and child over 7 years*:* initially 20 mcg at bedtime, only increased to 40 mcg if lower dose not effective

Nocturia associated with multiple sclerosis (when other treatments have failed), adult (under 65 years) 10–20 mcg at bedtime, dose not to be repeated within 24 hours

Use for diagnostic procedures*:*

Renal function testing (empty bladder at time of administration and limit fluid intake to 500 ml from 1

hour before until 8 hours after administration), adult 40 mcg; infant under 1 year 10 mcg (restrict fluid intake to 50% at next 2 feeds to avoid fluid overload), child 1–15 years 20 mcg

Mild to moderate haemophilia and von Willebrand's disease, adult 300 mcg (one 150 mcg spray into each nostril) 30 minutes before surgery or when bleeding; may be repeated at intervals of 12 hours (or at intervals of at least 3 days if self-administered)

Fibrinolytic response testing, adult 300 mcg (one 150 mcg spray into each nostril); blood sampled after 1 hour for fibrinolytic activity

By injection (as desmopressin acetate)

Diabetes insipidus, diagnosis (subcutaneous or intramuscular), adult and child 2 mcg (limit fluid intake to 500 ml from 1 hour before to 8 hours after administration)

Note: withdraw for at least 1 week for reassessment after 3 months

Pregnancy: can be taking in pregnancy only if clearly needed and should be used with caution.

Breast feeding: Not known to be harmful

- *DDAVP Intranasal Spray 100 mcg/ml -2.5 ml. Tablet 0.1 mg & 0.2mg*
- *DDAVP Tablet 0.1 mg & 0.2mg*

TERLIPRESSIN ACETATE

Indications: bleeding from oesophageal varices

Cautions: elderly; uncontrolled hypertension; vascular disease; heart disease; history of QT-interval prolongation; concomitant use of drugs that prolong the QT-interval; arrhythmia; respiratory disease; septic shock; electrolyte and fluid disturbances

Contra-indications

Renal impairment: use with caution in chronic renal failure

Pregnancy: avoid unless benefits outweigh risk—uterine contractions and increased intra-uterine pressure in early pregnancy, and decreased uterine blood flow reported

Breast-feeding: avoid unless benefits outweigh risk—no information available

Side Effects: abdominal cramps, diarrhoea, hypertension, hypotension, peripheral ischaemia, pallor, arrhythmia,

bradycardia, headache; less commonly nausea, vomiting, hot flushes, angina, myocardial infarction, tachycardia, intestinal ischaemia, bronchospasm, respiratory failure, pulmonary oedema, convulsions, hyponatraemia; rarely dyspnea; very rarely stroke, hyperglycaemia; also reported heart failure, skin necrosis.
Dose: by intravenous injection, 2 mg every 4 hours until bleeding controlled (after initial dose, may reduce to 1 mg every 4 hours if not tolerated or body-weight under 50 kg); max. duration 48 hours.

- *Glypressin Injection, powder for reconstitution 1 mg*
- *Varique Injection, powder for reconstitution 1-mg*

DYDROGESTERONE

This is a progestogen
Indications: endometriosis, habitual abortion, failure of nidation, menstrual disorders, amenorrhoea, dysfunctional uterine bleeding
Cautions: conditions that may worsen with fluid retention e.g. epilepsy, hypertension, migraine, asthma, cardiac or renal dysfunction, and in those susceptible to thromboembolism. breakthrough bleeding may rarely occur (increase dose). Liver function disturbance and jaundice; hepatic impairment; pregnancy.
Contra-indications: history of liver tumours; severe liver impairment; genital or breast cancer; severe arterial disease; undiagnosed vaginal bleeding & porphyria; history of idiopathic jaundice, severe pruritis, pemphinoid gestations.
Side Effects: menstrual disturbances; premenstrual like syndrome (including bloating, fluid retention, breast tenderness); weight gain, nausea, headache, dizziness, insomnia, drowsiness, depression, skin reactions (including urticaria, pruritus, rash, acne) hirsutism, alopecia, jaundice and anaphylactoid reactions.
Dose: endometriosis, 10 mg 2-3 times daily from day 5 to day 25th of cycle or continuously.
Failure of nidation, irregular cycles, 10 mg twice daily from 11th to 25th day for at least 6 cycles.
Habitual abortion, 10 mg twice daily from day 11th to 25th day of cycle until conception, then continuously until 20th week of pregnancy and gradually reduced.

Dysfunctional uterine bleeding, 10 mg twice daily for 5-7 days to arrest bleeding; 10 mg twice daily from 11th to 25th day of cycle to prevent bleeding. Dysmenorrhoea, 10 mg twice daily from 5th to 25th day of cycle. Amenorrhoea, 10 mg twice daily from 11th to 25th day of cycle following estrogen therapy from 1st to 25th day of cycle. Premenstrual syndrome, 10 mg twice daily from 12th to 26th day of cycle. Hormone replacement therapy, with continuous estrogen therapy, 10 mg daily on days 15-28 of each 28-day estrogen HRT cycle increased to 10 mg twice daily if withdrawal bleed is early or endometrial biopsy shows inadequate progestational response.

- *Duphaston Tablets 10 mg*

MEDROXY PROGESTERONE ACETATE

This is a progestogen.

Indications: endometriosis, dysfunctional uterine bleeding, secondary amenorrhoea; breast cancer; contraception.

Cautions: disturbances of normal cycle and irregular bleeding may occur; breast feeding.

Contra-indications: Current deep vein thrombosis or pulmonary embolism, Migraine Headache with aura, Before evaluation of unexplained vaginal bleeding, past H/O breast cancer and no evidence of current disease for 5 years, active liver disease, H/O stroke, IHD, Diabetes with complications; pregnancy.

Side Effects: Menstrual irregularities (bleeding or amenorrhea or both), and nervousness; indigestion.

Dose: by mouth, 2.5-10 mg daily for 5-10 days beginning on 16th-21st day of cycle, repeated for 2 cycles in dysfunctional bleeding and 3 cycles in secondary amenorrhoea.

Mild to moderate endometriosis, beginning on first day of menstrual cycle, 10 mg three times a day for 90 consecutive days.

By deep IM injection, endometrial or renal carcinoma, 400-1000 mg per week

Maintenance, if condition improved, 400 mg per month

Breast carcinoma, 500 mg/day for 28 days.

Maintenance, 500 mg twice weekly

By deep intramuscular injection, 150 mg within first 5 days of cycle or within first 5 days after parturition (delay

until 6 weeks after parturition if breast-feeding); for long-term contraception, repeated every 12 weeks (if interval greater than 12 weeks and 5 days, rule out Pregnancy before next injection and advise patient to use additional contraceptive measures (e.g. barrier) for 14 days after the injection)

- *Depo-Provera Injection 50 mg/ml In 3 ml Vials*
- *Provera Tablets 5mg*

MESTEROLONE

This is a testosterone derivative
Indications: hypogonadism, male infertility due to hypogonadism.
Cautions: breast cancer, prostatic carcinoma, nephritis, pregnancy, epilepsy, migraine, renal or hepatic impairment, circulatory failure, not recommended in children.
Contra-indications: breast cancer in men, prostate cancer, history of primary liver tumours, hypercalcemia, pregnancy, breast feeding, nephrosis
Side Effects: Headache, Depression, nausea, gynecomastia, erections may be more frequent and last longer, baldness, acne, melena, edema of the ankle.
Breast feeding: androgen deficiency, 25 mg 3-4 times daily for several months, reduced to 50-75 mg daily in divided doses for maintenance.
Male infertility, 100 mg daily for several months, use in CHILD not recommended

- *Proviron Tablets 25 mg*

NORETHISTERONE

This is a progestogen
Indications: endometriosis, premenstrual syndrome, dysmenorrhoea, dysfunctional uterine bleeding, postponement of menstruation, contraception, HRT, malignant diseases.
Cautions: same as for dydrogesterone; breast feeding.
Contra-indications: same as for dydrogesterone; pregnancy.
Side Effects: same as for dydrogesterone; rare with dose below 15 mg daily. Headaches and depression occur occasionally.

Dose: endometriosis, 10 mg daily starting on 5th day of cycle (increased if spotting occurs to 25 mg daily in divided doses to prevent breakthrough bleeding) for at least 6 months.
Dysfunctional uterine bleeding, menorrhagia, 5 mg 3 times daily for 10 days to arrest bleeding; to prevent bleeding, 5 mg twice daily from 19th to 26th day of cycle.
Dysmenorrhea, 5 mg 3 times daily from 5th to 25th day for 3-4 cycles.
Premenstrual syndrome, 5 mg 2-3 times daily from 19th to 26th day for several cycles (not recommended since there is no physiologic basis for such treatment).
Postponement of menstruation, 5 mg 3 times daily starting 3 days before anticipated onset (menstruation occurs 2-3 days after stopping).

- *Primolut N 5mg Tablet*

TAMOXIFEN

This is an estrogen antagonist.
Indications: to reduce the incidence of breast cancer in women at high risk for developing breast cancer disease; metastatic breast cancer; infertility in women with anovulatory disorders.
Cautions: pregnancy and breast-feeding; occasional cystic ovarian swellings in premenopausal women, occasional hypercalcaemia if bony metastases; increased risk of thromboembolic events when used with cytotoxics; porphyria.
Contra-indications: pregnancy.
Side Effects: amenorrhoea in premenopausal women; hot flushes; vaginal bleeding, gastro-intestinal disturbances, endometrial cancer, increase triglyceride, thromboembolism, visual disorders.
Dose: breast cancer, initially 20 mg daily.
Anovulatory infertility, 20 mg daily on second, third, fourth and fifth days of cycle.
Doses may be increased to 40 mg then 80 mg for subsequent
courses.
If cycles irregular, start initial course on any day, with subsequent courses starting 45 days later or on second day of cycle if menstruation occurs.

- *Nolvadex Tablets 10 mg*

TESTOSTERONE UNDECANOATE

Indications: testosterone replacement therapy in male hypogonadal disorders; hypopituitarism; endocrine impotence; some types of infertility.
Cautions: cardiac failure; renal dysfunction; hypertension; epilepsy or migraine; diabetes mellitus, skeletal metastases (risk of hypercalcaemia); prepubertal boys to avoid premature fusion of epiphyses and increased frequency of erection; oligospermia and decreased ejaculatory volume; water and salt retention.
Contra-indications: breast cancer in men, prostate cancer, history of primary liver tumours, hypercalcaemia, pregnancy, breast feeding, nephritic syndrome.
Side Effects: prostate abnormalities and prostate cancer, headache, depression, gastrointestinal bleeding, nausea, cholestatic jaundice, changes in libido, gynaecomastia, polycythaemia, anxiety, asthenia, paraesthesia, hypertension, electrolyte disturbances with sodium retention with oedema and hypercalcaemia, weight gain, increased bone growth; androgenic effects such as hirsutism, male pattern baldness, seborrhea, acne, pruritis, excessive frequency and duration of penile erection, precocious sexual development and premature closure of epiphyses in prepubertal males, suppression of spermatogenesis in men and virility in women.
Dose: an initial dose of 120-160 mg daily for 2-3 weeks followed by a maintenance dose of 40-120 mg daily. For injection; deep intramuscular injection, androgen deficiency, 1 ml usually every 3 weeks.

- *Andriol Capsules 40 mg*
- *Testosterone Propionate 250mg/ ml Injection*

DUTASTERIDE

Indications: benign prostatic hyperplasia
Cautions: decrease serum concentration of prostate cancer markers such as prostate-specific antigen; reference values may need adjustment. Both dutasteride and finasteride are excreted in semen and use of a condom is recommended if sexual partner is pregnant or likely to become pregnant. Women of childbearing potential should avoid handling crushed or broken tablets of finasteride and leaking capsules of dutasteride.

Male breast cancer*:* Cases of male breast cancer have been reported. Patients or their carers should be told to promptly report to their doctor any changes in breast tissue such as lumps, pain, or nipple discharge
Hepatic impairment: avoid in severe impairment—no information available.
Contra-indications: Diltiazem*:* Plasma concentration of dutasteride increased. Verapamil*:* Plasma concentration of dutasteride increased.
Side Effects: of dutasteride and finasteride include impotence, decreased libido, ejaculation disorders, and breast tenderness and enlargement.
Dose: 500 micrograms daily, review treatment at 3–6 months and then every 6–12 months (may require several months treatment before benefit is obtained)

- *Avodart 500 micrograms Capsules*

TETRACOSACTRIN ZINC

(Tetracosactide) This is an analogue of corticotrophin (ACTH)
Indications: diagnosis of adrenocortical function.
Cautions: hypersensitivity to tetracosactrin or corticotrophin preparation, asthma or atopy
Contra-indications: Same as for dexamethasone; the depot preparation is not suitable for use in neonates due to presence of benzyl alcohol as additive.
Side Effects: Same as for dexamethasone; hypersensitivity reactions including marked redness and pain at injection sit flushing, severe malaise, urticaria, pruritus, dyspnea, edema, anaphylaxis.
Dose: for the depot preparation, diagnostic (5-hour test), by IM injection, 1 mg as a single dose.
For the aqueous preparation, diagnostic (30-minute test), by IM or IV injection, 250 mcg as a single dose.

- *Synacthen Injection 0.25 mg/2ml.*

THYROXINE SODIUM (Levothyroxine sodium)

Indications: hypothyroidism including myxoedema.
Cautions: angina, cardiovascular disorders, hypertension, adrenal insufficiency, thyrotoxicosis; diabetes insipidus, diabetes mellitus, pregnancy, breast feeding.

Contra-indications: thyrotoxicosis, uncorrected adrenal insufficiency.
Side Effects: hyperthyroidism due to therapeutic overdose, headache, anxiety, irritability, emotional liability, insomnia, tremors, muscle weakness, palpitation, angina, heart failure, dyspnea, diarrhea, vomiting, abdominal cramps, hair loss, flushing, menstrual irregularities.
Dose: initially 50-100 mcg increasing by 25-50 mcg at 3-4 weeks intervals;
Maintenance dose, 100-200 mcg or more daily;
Infants, 10 mcg/kg daily to a max. of 50 mcg daily.
Up to 5 years, 100 mcg daily;
Up to 12 years, adult dose.

- *Eltroxin Tablet 25mcg, 50mcg & 100 mcg*

VASOPRESSIN (ADH)

This is a posterior pituitary hormone.
Indications: diabetes insipidus; bleeding from oesophageal varices.
Cautions: heart failure, hypertension, asthma, epilepsy, migraine and other conditions aggravated by water retention, renal impairment, pregnancy.
Contra-indications: Coronary artery disease, chronic nephritis.
Side Effects: fluid retention, pallor, tremor, sweating, vertigo, headache, nausea, vomiting, belching, abdominal cramps, desire to defecate, hypersensitivity reaction including anaphylaxis, constriction of coronary arteries leading to anginal attacks, myocardial and/or peripheral ischemia and rarely gangrene
Dose: by Subcutaneous or IM injection, diabetes insipidus, 5-20 units at least twice daily.
By intravenous infusion, variceal bleeding, 5-20 units over 15 minutes.

- *Pitressin Injection 10 Units / ml*

DRUGS AFFECTING BONE METABOLISM

BISPHOSPHONATES

Bisphosphonates are adsorbed onto hydroxyapatite crystals in bone, slowing both their rate of growth and dissolution, and therefore reducing the rate of bone turnover. Bisphosphonates have an important role in the prophylaxis and treatment of osteoporosis and corticosteroid-induced osteoporosis

ALENDRONIC ACID

Indications: Treatment of postmenopausal osteoporosis and osteoporosis in men. Prevention and treatment of corticosteroid-induced osteoporosis in postmenopausal women not receiving hormone replacement therapy.
Cautions: upper gastro-intestinal disorders (dysphagia, symptomatic oesophageal disease, gastritis, duodenitis, or ulcers—see also under contra-indications and side effects); history (within 1 year) of ulcers, active gastro-intestinal bleeding, or surgery of the upper gastro-intestinal tract; correct disturbances of calcium and mineral metabolism (e.g. vitamin-D deficiency, hypocalcaemia) before starting and monitor serum-calcium concentration during treatment; consider dental check-up before initiating bisphosphonate (risk of osteonecrosis of the jaw, exclude other causes of osteoporosis; atypical femoral fractures.
Contra-indications: abnormalities of oesophagus and other factors which delay emptying (e.g. stricture or achalasia), hypocalcaemia
Renal impairment: Avoid if eGFR less than 35 ml/minute/1.73 m^2
Pregnancy: Avoid
Breast-feeding: no information available
Side Effects: oesophageal reactions, abdominal pain and distension, dyspepsia, regurgitation, melaena, diarrhoea or constipation, flatulence, musculoskeletal pain, headache; *rarely* rash, pruritus, erythema, photosensitivity, uveitis, scleritis, transient decrease in serum calcium and phosphate; nausea, vomiting, gastritis, peptic ulceration, hypersensitivity reactions (including urticaria and angioedema), atypical femoral fractures with

long-term use, myalgia, malaise, and fever at initiation of treatment; very rarely severe skin reactions (including Stevens-Johnson syndrome), osteonecrosis of the jaw.
Oesophageal reactions: Severe oesophageal reactions (oesophagitis, oesophageal ulcers, oesophageal stricture and oesophageal erosions) have been reported; patients should be advised to stop taking the tablets and to seek medical attention if they develop symptoms of oesophageal irritation such as dysphagia, new or worsening heartburn, pain on swallowing or retrosternal pain
Dose: Treatment of postmenopausal osteoporosis, 10 mg daily or 70 mg once weekly. Treatment of osteoporosis in men, 10 mg daily. Prevention and treatment of corticosteroid-induced osteoporosis in postmenopausal women not receiving hormone replacement therapy, 10 mg daily
Counselling: Tablets should be swallowed whole with plenty of water while sitting or standing; to be taken on an empty stomach at least 30 minutes before breakfast (or another oral medicine); patient should stand or sit upright for at least 30 minutes after taking tablet.

- *Fosamax 70mg Tablets, (as sodium alendronate)*

IBANDRONIC ACID

Indications: Reduction of bone damage in bone metastases in breast cancer.
Hypercalcaemia of malignancy, Treatment of postmenopausal osteoporosis.
Cautions: consider dental check-up before initiating bisphosphonate (risk of osteonecrosis of the jaw; atypical femoral fractures, monitor renal function and serum calcium, phosphate and magnesium; cardiac disease (avoid fluid overload).
Contra-indications: hypocalcaemia; oral route abnormalities of the oesophagus and other factors which delay emptying (e.g. stricture or achalasia)
Renal impairment: for treatment of osteoporosis, avoid if eGFR less than 30 ml/minute/1.73 m^2; for reduction of bone damage in bone metastases, if eGFR 30–50 ml/minute/1.73 m^2 reduce intravenous dose to 4 mg and infuse over 1 hour, reduce oral dose to 50 mg on alternative days, if eGFR less than 30 ml/minute/1.73 m^2

reduce intravenous dose to 2 mg and infuse over 1 hour, reduce oral dose to 50 mg once weekly
Pregnancy: avoid
Breast-feeding: avoid—present in milk in animal studies
Side Effects: hypocalcaemia, hypophosphataemia, influenza-like symptoms (including fever, chills, and MUSCLE PAIN), bone pain; oesophageal reactions, diarrhoea, nausea, vomiting, gastritis, abdominal pain, dyspepsia, pharyngitis; headache, asthenia, rash; rarely anaemia, atypical femoral fractures, hypersensitivity reactions (pruritus, bronchospasm and angioedema reported); urticaria; injection-site reactions; very rarely osteonecrosis of the jaw, Oesophageal reactions Severe oesophageal reactions reported with all oral bisphosphonates; patients should be advised to stop tablets and seek medical attention for symptoms of oesophageal irritation such as dysphagia, pain on swallowing, retrosternal pain, or heartburn.
Dose: Reduction of bone damage in bone metastases in breast cancer, by mouth, 50 mg daily, or by intravenous infusion, 6 mg every 3–4 weeks.
Hypercalcaemia of malignancy by intravenous infusion, according to serum calcium concentration, 2–4 mg in single infusion.
Treatment of postmenopausal osteoporosis, by mouth, 150 mg once a month or by intravenous injection over 15–30 seconds, 3 mg every 3 months
child not recommended.
Counselling Tablets should be swallowed whole with plenty of water while sitting or standing; to be taken on an empty stomach at least 30 minutes (ibandronic acid tablets, 50 mg) or 1 hour before first food or drink (other than water) of the day, or another oral medicine; patient should stand or sit upright for at least 1 hour after taking tablet.

- *Bonviva Tablets 150 mg*

ZOLEDRONIC ACID

Indications: Treatment of Paget's disease of bone, Treatment of postmenopausal osteoporosis and osteoporosis in men (including corticosteroid-induced osteoporosis).

Cautions: correct disturbances of calcium metabolism (e.g. vitamin D deficiency, hypocalcaemia) before starting; monitor serum electrolytes, calcium, phosphate and magnesium; cardiac disease (avoid fluid overload); consider dental check-up before initiating bisphosphonate (risk of osteonecrosis of the jaw, see Bisphosphonates***:*** Osteonecrosis of the Jaw);
Contra-indications: women of child-bearing potential
Hepatic impairment: caution in severe hepatic impairment—limited information available
Renal impairment: avoid if serum creatinine above 400 micromol/litre in tumour-induced hypercalcaemia; in advanced malignancies involving bone, if eGFR 50–60 ml/minute/1.73 m^2 reduce dose to 3.5 mg every 3–4 weeks, if eGFR 40–50 ml/minute/1.73 m^2 reduce dose to 3.3 mg every 3–4 weeks, if eGFR 30–40 ml/minute/1.73 m^2 reduce dose to 3 mg every 3–4 weeks, avoid if eGFR less than 30 ml/minute/1.73 m^2 (or if serum creatinine greater than 265 micromol/litre); if renal function deteriorates in patients with bone metastases, withhold dose until serum creatinine returns to within 10% of baseline value; avoid in Paget's disease, treatment of postmenopausal osteoporosis and osteoporosis in men if eGFR less than 35 ml/minute/1.73 m^2; see also cautions above
Pregnancy: avoid—toxicity in animal studies
Breast-feeding: avoid—no information available
Side Effects: hypophosphataemia, anaemia, influenza-like symptoms including bone pain, myalgia, arthralgia, fever and rigors; gastro-intestinal disturbances; atrial fibrillation; headache, dizziness, conjunctivitis, renal impairment (rarely acute renal failure); less commonly anorexia, taste disturbance, dry mouth, stomatitis, chest pain, hypertension, hypotension, dyspnea, cough, paraesthesia, tremor, anxiety, lethargy, sleep disturbance, blurred vision, weight gain, pruritus, rash, sweating, muscle cramps, haematuria, proteinuria, urinary frequency, hypersensitivity reactions (including angioedema), asthenia, peripheral oedema, thrombocytopenia, leucopenia, hypomagnesaemia, hypokalaemia, also injection-site reactions; rarely bradycardia, confusion, hyperkalaemia, hypernatraemia,

pancytopenia, osteonecrosis of the jaw, atypical femoral fractures.very rarely uveitis and episcleritis
Dose: reduction of bone damage in advanced malignancies involving bone, by intravenous infusion, 4 mg over at least 15 minutes every 3–4 weeks; child not recommended.
Note: Calcium 500 mg daily and vitamin D 400 units daily should also be taken, Hypercalcaemia of malignancy, by intravenous infusion, 4 mg as a single dose over at least 15 minutes; child not recommended.

- *Aclasta Intravenous infusion, 50 mcg/ml, 100-ml*

7 - OBSTETRICS, GYNAECOLOGY & URINARY TRACT DISORDERS

DRUG USED IN OBSTETRICS

PROSTAGLANDINS AND OXYTOCICS

ATOSIBAN

Indications: uncomplicated premature labour
Cautions: monitor blood loss after delivery; intrauterine growth restriction; abnormal placental site
Note:
Contra-indications: eclampsia and severe preeclampsia, intra-uterine infection, intra-uterine fetal death, antepartum haemorrhage (requiring immediate delivery), placenta praevia, abruption placenta, intrauterine growth restriction with abnormal fetal heart rate, premature rupture of membranes after 30 weeks' gestation
Hepatic impairment: no information available
Renal impairment: no information available
Side Effects: nausea, vomiting, tachycardia, hypotension, headache, dizziness, hot flushes, hyperglycaemia, injection-site reaction; less commonly pruritus, rash, fever, insomnia
Dose: By intravenous injection, initially 6.75 mg over 1 minute, then by intravenous infusion 18 mg/hour for 3 hours, then 6 mg/hour for up to 45 hours; max. duration of treatment 48 hours

- *Tractocile 7.5 mg/ml 0.9 ml Injection, atosiban (as acetate) (6.75-mg) vial*
- *Tractocile 7.5 mg/ml 5 ml Concentrate for intravenous infusion, atosiban (as acetate) 7.5 mg/ml*

CARBETOCIN

Indications: prevention of uterine atony after caesarean section
Cautions: hyponatraemia; cardiovascular disease (avoid if severe); migraine; asthma
Contra-indications: pre-eclampsia and eclampsia; epilepsy

Hepatic impairment: manufacturer advises avoid
Renal impairment: manufacturer advises avoid
Side Effects: nausea, vomiting, abdominal pain, metallic taste; flushing, hypotension, chest pain; dyspnea; headache, tremor, dizziness; anaemia; back pain; pruritus; feeling of warmth, chills; tachycardia and sweating also reported
Dose: By slow intravenous injection over 1 minute, a single dose of 100 micrograms, as soon as possible after delivery, preferably before removal of placenta

- *Pabal Injection, 100 mcg/ml*

DINOPROSTONE (Prostaglandin E2))

Indications: induction of labor; the IV preparation is used for foetal death in utero and therapeutic termination of pregnancy.
Cautions: asthma, excessive dosage may cause uterine rupture. glaucoma and raised intra-ocular pressure; cardiac, hepatic or renal impairment; hypertension; patient with epilepsy; uterine scarring; monitor uterine activity and fetal status; uterine rupture; ; monitor for post delivery disseminated intravascular coagulation; risk factors for disseminated intravascular coagulation; effect of oxytocin enhanced.
Contra-indications: conditions where prolonged uterine contractions would be inappropriate; active cardiac, pulmonary, renal or hepatic disease. Intravenous route is contraindicated with pelvic infection. placenta praevia or unexplained vaginal bleeding during pregnancy, ruptured membranes, major cephalopelvic disproportion or fetal malpresentation, history of caesarean section or major uterine surgery, untreated pelvic infection, fetal distress, grand multiparas and multiple pregnancy, history of difficult or traumatic delivery; avoid extra-amniotic route in cervicitis or vaginitis
Side Effects: nausea, vomiting, diarrhoea; uterine hypertonus, severe uterine contractions, pulmonary or amniotic fluid embolism, abruptio placenta, fetal distress, maternal hypertension, bronchospasm, rapid cervical dilation, fever, backache; uterine hypercontractility with or without fetal bradycardia, low Apgar scores; cardiac arrest, uterine rupture, stillbirth or neonatal death also reported; vaginal symptoms; intravenous administration

may result in flushing, shivering, headache, dizziness, temporary pyrexia and raised leucocytosis; disseminated intravascular coagulation; also local tissue reaction and erythema had been reported after intravenous administration and possibility of infection after extra-amniotic administration
prostaglandins potentiate uterotonic effect of oxytocin
Dose: by IV route, diluted with normal saline or concentration 5% dextrose to produce a solution of 1.5 mcg/ml and infused at a 0.25 meg/minute for 30 minutes and then maintained or increased.
Cases of fatal death in utero may require higher doses; initial doses of 0.5 mcg/minute may be used with step increments at intervals of not less than one hour.
Therapeutic abortion, missed abortion, and hydatidiform mole, as a solution containing 5 mcg/ml, 2.5 mcg/minute for at least 30 minutes then increased if necessary to 5mcg/minute; should be maintained for at least 4 hours before increasing further.
By vagina, induction of labour, in vaginal tablets, inserted high into the posterior fornix, 3mg, followed after 6-8 hours by 3mg if labor is not established; max 6mg of vaginal tablets.
For gel, by cervix, pre-induction cervical softening and dilation, 500 mcg.
The patient should remain recumbent for 10-15 minutes.
Breast feeding: undetermined

- *Dinoprostone 3mg. Pessaries*
- *Prostin E2 1mg./ml Inj IV*

METHYLERGOMETRINE MALEATE

Indications: prevention and treatment of post-partum haemorrhage.
Cautions: toxemia, cardiac disease, hypertension, sepsis, multiple pregnancy.
Contra-indications: 1st and 2nd stage of labour, vascular disease, impaired pulmonary, hepatic and renal function. hypertension,
Side Effects: Nausea, vomiting, transient vasoconstriction.
Dose: after delivery of the anterior shoulder or on completion of the third stage of labour, by IM injection,

200 mcg, repeated for up to 5 doses if necessary at intervals of 2-4 hours.
In emergencies, by slow IV injection, 200 mcg over at least 60 second.
During the puerperium, by mouth, 200 mcg 3-4 daily for up to 7 days.

- *Methergine Injection 0.2mg/1ml*
- *Methergine Tablets 0.125mg*

OXYTOCIN

Indications: induction and augmentation of labor; management of missed or incomplete abortion; post-partum haemorrhage.
Cautions: hypertension, pressor drugs, multiple pregnancy, high parity, previous caesarean section. particular caution needed when given for induction or enhancement of labour in presence of borderline cephalopelvic disproportion, pregnancy-induced hypertension both mild or moderate, cardiac disease, women over 35 years or with history of lower-uterine segment caesarean section; water intoxication and hyponatraemia—avoid large infusion volumes and restrict fluid intake by mouth; effects enhanced by concomitant prostaglandins (very careful monitoring), caudal block anaesthesia (may enhance hypertensive effects of sympathomimetic vasopressors),
Contra-indications: hypertonic uterine contractions, fetal distress; any condition where spontaneous labour or vaginal delivery inadvisable; avoid prolonged administration in oxytocin-resistant uterine inertia, severe pre-eclamptic toxaemia or severe cardiovascular disease
Side Effects: uterine spasm (may occur at low doses), uterine hyperstimulation (usually with excessive doses—may cause fetal distress, asphyxia and death, or may lead to hypertonicity, tetanic contractions, soft-tissue damage or uterine rupture); water intoxication and hyponatraemia associated with high doses with large infusion volumes of electrolyte-free fluid; also nausea, vomiting, arrhythmias; rashes and anaphylactoid reactions (with dyspnea, hypotension or shock) also reported; placental abruption and amniotic fluid embolism also reported on overdose
Dose: by slow IV infusion, induction and augmentation of labor, as a solution containing 5 units in 500ml of a

physiologic electrolyte solution, 1-4 milliunits per minute, adjusted according to response.
Incomplete, inevitable or missed abortion, by slow IV injection, 5 units followed if necessary by IV infusion, 0.02-0.04 units/minute or faster.
Treatment of post-partum haemorrhage, by slow IV injection, 5 units, followed in severe cases by IV infusion of 5-20 units/500ml given at a rate of 15 drops/ minute, adjusted according to response.
Prevention of post-partum hemorrhage, after delivery of placenta, by slow IV injection, 5 units (if infusion used for induction or enhancement of labour, increase rate during third stage and for next few hours).
Induction of labour for medical reasons or stimulation of labour in hypotonic uterine inertia, by intravenous infusion, max. 5 units in 1 day (may be repeated next day starting again at 0.001–0.002 units/minute)
Important: Careful monitoring of fetal heart rate and uterine motility essential for dose titration (avoid intravenous injection during labour); discontinue immediately in uterine hyperactivity or fetal distress
Caesarean section, by slow intravenous injection immediately after delivery, 5 units
Prevention of postpartum haemorrhage, after delivery of placenta, by slow intravenous injection, 5 units (if infusion used for induction or enhancement of labour, increase rate during third stage and for next few hours)
Note: May be given in a dose of 10 units by intramuscular injection instead of oxytocin with ergometrine.
Treatment of postpartum haemorrhage, by slow intravenous injection, 5–10 units, followed in severe cases by intravenous infusion of 5–30 units in 500ml infusion fluid at a rate sufficient to control uterine atony
Important: Avoid rapid intravenous injection (may transiently reduce blood pressure); prolonged administration.
Incomplete, inevitable or missed abortion, by slow intravenous injection, 5 units followed if necessary by intravenous infusion, 0.02–0.04 units/minute or faster
Prolonged intravenous administration at high doses with large volume of fluid (as possible in inevitable or missed abortion or postpartum haemorrhage) may cause water

intoxication with hyponatraemia. To avoid*:* use electrolyte-containing diluent (i.e. not glucose), increase oxytocin concentration to reduce fluid, restrict fluid intake by mouth; monitor fluid and electrolytes

- *Syntocinon 5 Units/ml Injection*
- *Oxytocin 5 Units Inj 1ml*

SULPROSTONE

Indications: termination of pregnancy.

- *Nalador 500 mcg/ Ampoule*

DUCTUS ARTERIOUS

ALPROSTADIL

Indications: maintenance of patency in congenital heart defects (ductus arteriosus) in neonates prior to corrective surgery; erectile dysfunction.
Cautions: history of haemorrhage, avoid in hyaline membrane disease, monitor arterial pressure. priapism—patients should be instructed to report any erection lasting 4 hours or longer—anatomical deformations of penis, follow up regularly to detect signs of penile fibrosis, discontinuation the drug if angulation, cavernosal fibrosis or Peyronie's disease develop.
Contra-indications: in sickle cell anaemia, multiple myeloma or leukaemia; not to be used with other agents for erectile dysfunction, in patients with penile implants or when sexual activity medically inadvisable; urethral application also contra-indicated in urethral stricture, severe hypospadia, severe curvature, balanitis, urethritis
Side Effects: apnoea (particularly in infants under 2 kg), flushing, bradycardia, hypotension, tachycardia, cardiac arrest, oedema, diarrhoea, fever, convulsions, disseminated intravascular coagulation, hypokalemia; cortical proliferation of long bones, weakening of the walls of the ductus arteriosus and pulmonary artery may follow prolonged use, gastric-outlet obstruction reported penile pain, priapism, reactions at injection site include haematoma, haemosiderin deposits, penile rash, penile oedema, penile fibrosis, haemorrhage, inflammation; other local reactions include urethral burning and bleeding, penile warmth, numbness, penile or urinary-

tract infection, irritation, sensitivity, phimosis, pruritus, erythema, venous leak, abnormal ejaculation; systemic effects reported include testicular pain and swelling, scrotal disorders, changes in micturition (including haematuria), nausea, dry mouth, fainting, hypotension (very rarely circulatory collapse) or hypertension, rapid pulse, vasodilatation, chest pain, supraventricular extrasystole, peripheral vascular disorder, dizziness, weakness, localised pain (buttocks, legs, genital, perineal, abdominal), headache, pelvic pain, back pain, influenza-like syndrome, swelling of the leg veins
Dose: by intravenous infusion, initially 50-100 nanograms/kg/minute, then decreased to lowest effective dose. [but lower dose such as 10 nanograms/kg/minute may be effective and safer]

- *Prostin VR 500 mcg/ml Injection*

MISOPROSTOL

Indications Misoprostol, a synthetic prostaglandin analogue has antisecretory and protective properties, promoting healing of gastric and duodenal ulcers. It can prevent NSAID-associated ulcers, its use being most appropriate for the frail or very elderly from whom NSAIDs cannot be withdrawn.
misoprostol to induce medical abortion or labour
Cautions: conditions where hypotension might precipitate severe complications (e.g. cerebrovascular disease, cardiovascular disease)
Contra-indications: pregnancy or planning to be pregnant, important***:*** women of childbearing age, and breast-feeding***.*** Manufacturer advises that misoprostol should not be used in women of childbearing age unless the patient requires non-steroidal anti-inflammatory (NSAID) therapy and is at high risk of complications from NSAID-induced ulceration. In such patients, it is advised that misoprostol should only be used if the patient takes effective contraceptive measures and has been advised of the risks of taking misoprostol if pregnant.
Side Effects: diarrhoea, dyspepsia, abdominal pain, flatulence, nausea and vomiting, abnormal vaginal bleeding, rashes, dizziness
Dose Benign gastric and duodenal ulceration and NSAID-associated ulceration, 800 mcg daily (in 2–4 divided

doses) with breakfast (or main meals) and at bedtime; treatment should be continued for at least 4 weeks and may be continued for up to 8 weeks if required
Prophylaxis of NSAID-induced gastric and duodenal ulcer, 200 mcg 2–4 times daily taken with the NSAID
child not recommended
Breast feeding: Avoid as no information available as advised by manufacturer.

- *Cytotec 200mg Tablets*

MYOMETRIAL RELAXANTS

TIBOLON

Indications short-term treatment of symptoms of oestrogen deficiency (including women being treated with gonadotropin releasing hormone analogues); osteoporosis prophylaxis in women at risk of fractures (second-line)
Cautions renal impairment, liver disease, epilepsy, migraine, diabetes mellitus, hypercholesterolaemia; withdraw the drug if signs of thromboembolic disease, abnormal liver function tests or cholestatic jaundice
Contra-indications: hormone-dependent tumours, history of cardiovascular or cerebrovascular disease (e.g. thrombophlebitis, thromboembolism), uninvestigated vaginal bleeding, severe liver disease, pregnancy, breast-feeding
Side Effects abdominal pain, weight changes, leucorrhoea, facial hair, and rarely amnesia; gastro-intestinal disturbances, oedema, dizziness, headache, migraine, depression, breast cancer, arthralgia, myalgia, vaginal bleeding, visual disturbances, seborrhoeic dermatitis, cases with rash and pruritus had been reported
Dose 2.5mg daily
Unsuitable for use in the premenopause (unless being treated with gonadotropin-releasing hormone analogue) and as (or with) an oral contraceptive; also unsuitable for use within 12 months of last menstrual period (may cause irregular bleeding); induce withdrawal bleed with progestogen if transferring from another form of HRT

- *Livial 2.5mg Tab.*

CONTRACEPTIVES

ETHINYLESTRADIOL

(Ethinyloestradiol)

Indications Ethinylestradiol is used for short-term treatment of symptoms of oestrogen deficiency, for osteoporosis prophylaxis if other drugs cannot be used and for the treatment of female hypogonadism and menstrual disorders.

Ethinylestradiol is occasionally used under specialist supervision for the management of hereditary haemorrhagic telangiectasia. For use in prostate cancer.

Cautions: cardiovascular disease as it causes sodium retention with oedema, thromboembolism, hepatic impairment (jaundice).

Contra-indications: see under Combined Hormonal Contraceptives and under Oestrogen for HRT.

Side Effects: Include nausea, fluid retention, and thrombosis. Impotence and gynaecomastia have been reported in men.

Dose Menopausal symptoms and osteoporosis prophylaxis, (with progestogen for 12–14 days per cycle in women with intact uterus), 10–50 mcg daily for 21 days, repeated after 7-day tablet-free period

Female hypogonadism, 10–50 mcg daily, usually on cyclical basis; initial oestrogen therapy should be followed by combined oestrogen and progestogen therapy

Menstrual disorders, 20–50 mcg daily from day 5 to 25 of each cycle, with progestogen added either throughout the cycle or from day 15 to 25

Pregnancy: Epidemiological evidence suggests no harmful effects on fetus

Breast feeding: Avoid till 6/12 to prevent adverse effects on lactation

- *Ethinylestradiol 10mcg Tab.*

ANTI-INFECTIVE DRUGS

MICONAZOLE NITRATE

Indications: vaginal and vulvar candidiasis. Local treatment of vulvovaginal candidiasis and superinfections

due to gram-positive bacteria. The Cream may also be used for the treatment of mycotic balanitis.
Cautions: if local sensitisation or an allergic reaction occur, the treatment should be discontinued. General hygienic measures should be observed to control sources of infection and reinfection.
Appropriate therapy is indicated when the sexual partner is also infected. cautions should be exercised when using the Cream during breast-feeding.
Contra-indications: in individuals with a known hypersensitivity to miconazole or any other components of these medicines.
Side Effects: Cream is usually well tolerated, and adverse reactions are rare and mild in most cases.
A few cases of local irritation, pruritus and burning sensation have been observed, especially at the start of treatment. Complaints of pelvic cramping, hives, skin rash have also been reported
Drug Interactions: Contact should be avoided between certain latex products such as contraceptive diaphragms or condoms and the cream since the rubber may be damaged. Unintended pregnancy or transmission of infectious disease may result.
Pharmacokinetics: Systemic absorption after intravaginal administration is limited. Eight hours after application 90% of miconazole nitrate is still present in the vagina. Unchanged miconazole could not be traced in blood plasma or urine.
Dose Administration***:*** Once daily (before bedtime), the contents of one applicator (approximately 5g of cream) should be squeezed deeply into the vagina, for seven days, even after pruritis and leukorrhoea has disappeared and regardless of intervening mensturation. Insert 1 pessary daily for 14 days or 1 pessary twice daily for 7 days.
Pregnancy: Although intravaginal absorption is limited, *Gyno-daktarin* should only be used in the first trimester of pregnancy if, in the judgement of the physician, the potential benefits outweigh the possible risks.
Breast Feeding It is not known whether miconazole nitrate is excreted in human milk.

- *Mikozal Cream 2%*
- *Mycoheal Vaginal Cream*

- *Gyno-Daktarin Cream.*
- *Mycoheal 100mg Vaginal Pessaries*

DIAGNOSTICS

INDIGO CARMINE

Indications: test of renal function. A marker dye, particularly in urological procedures and amniocentesis.
Dose: 40mg by IV injection.

- *Indigo Carmine 0.4%- Injection 5ml Ampoules*

METHYLENE BLUE

Indications: methaemoglobinaemia; a dye in diagnostic procedures such as fistula detection and the diagnosis of rupture amniotic membranes.
Cautions: SC injection causes necrotic abscesses; intrathecal injection causes neural damage; severe renal impairment; pregnancy and breast-feeding
Contra-indications: !**:** patients with G6PD-deficiency; methaemoglobinaemia induced by sodium nitrite during the
treatment of cyanide poisoning; methaemoglobinaemia due to chlorate poisoning.
Dose: drug-induced methaemoglobinaemia, by IV injection as a 1% solution, 1-2mg/kg over a period of several minutes.

- *Methylene Blue 1% Injection*

DRUGS USED IN URINARY TRACT DISORDERS

LIDOCAINE HYDROCHLORIDE

(Lignocaine hydrochloride)
Indications: surface anesthesia of urethra during catheterization cystoscopy; may be used on oral mucosa to relieve pain in connection with dentistry.
Lidocaine (lignocaine) gel is a useful topical application in urethral pain or to relieve the discomfort of catheterisation
Dose: for anesthesia of the urethra, in men, 10ml followed by further 10ml (total up to 40ml for cystoscopy); in women, 5-10ml.

Endoscopy, 10-20ml.
Endotracheal intubation, 5ml applied to surface of tube.

- *Xylocaine Gel 2%*

OXYBUTYNIN HYDROCHLORIDE

Indications: urinary frequency, urgency and incontinence and nocturnal enuresis, in bladder dysfunction, especially in the elderly; uninhibited vesical hyperactivity after bladder surgery, prostatectomy and in association with acute and chronic cystitis. neurogenic bladder instability, and nocturnal enuresis associated with overactive bladder
Cautions: pregnancy, children less than 5 years of age; ulcerative colitis, toxic megacolon autonomic neuropathy, severe heart disease, porphyria, renal or hepatic disease.
Contra-indications: ileostomy, colostomy; glaucoma, myasthenia gravis.
Side Effects: anticholinergic side effects may occur as dry mouth, blurred vision, decreased sweating, drowsiness, tachycardia, palpitations, urinary retention and constipation. Allergic skin reactions may occur. Dizziness; less commonly anorexia, facial flushing; rarely night terrors; application site reactions with patches
Dose: adults, by mouth initially 2.5–5mg 2–3 times daily increased if necessary to max. 5mg 4 times daily; elderly initially 2.5–3mg twice daily, increased to 5mg twice daily according to response and tolerance,
Child over 5 year, neurogenic bladder instability, 2.5mg - 3mg twice daily increased to 5mg twice daily; max. dose is 5mg 3times daily.
Nocturnal enuresis in child over 7 days, 2.5 - 3mg twice daily increased to 5mg 2-3 times daily (last dose before bedtime).
Pregnancy: avoid unless benefit outweighs risk.
Breast feeding: Present in milk- advise to avoid

- *Cystrin Tablets 5mg*

PAPAVERINE HYDROCHLORIDE

Indications: relieving ischaemia and symptoms of senile dementia but its value is doubtful; impotence.
Although not licensed the smooth muscle relaxant papaverine has also been given by intracavernosal

injection for erectile dysfunction. Patients with neurological or psychogenic impotence are more sensitive to the effect of papaverine than those with vascular abnormalities. Phentolamine is added if the response is inadequate Persistence of the erection for longer than 4 hours is an emergency

Cautions: intravenous injection can cause cardiac arrhythmias; glaucoma; depressed myocardial function.

Contra-indications: complete atrioventricular block.

Side Effects: gastro-intestinal disturbance, flushing of the face, headache, malaise, drowsiness, skin rash, sweating and vertigo; hypersensitivity reactions.

Dose: impotence, by intra-cavernosal injection, 30mg together with phentolamine 1mg.

- *Papaverine HCl Injection 10mg/ml*

POTASSIUM CITRATE (Alkaline diuretic))

Indications: relief of discomfort in mild urinary tract infections; alkalinization of urine.

Cautions: renal impairment, cardiac disease, elderly,

Side Effects: hyperkalemia on prolonged high dosage, mild
diuresis.

Dose: Cystitis, adults and children over 6 years, 3 g, well diluted with water, 3 times daily.
Child 1-6 years, 1.5 g.
Alkalinization of urine, 3-6 g with water every 6 hours.

- *Potassium Citrate Mixture Contains 1.5 g/ 5ml*

SODIUM CITRATE

Indications: relief of discomfort in mild urinary tract infections.

Cautions: renal impairment, cardiac disease, pregnancy, patients on sodium-restricted diet; elderly.

Side Effects: mild diuresis.

Dose: about 4 g 3 times daily for a max. of 3 days.

- *Sodium citrate 3%, dilute hydrochloric acid 0.2%, in purified water, freshly boiled and cooled, and sterilised*

ACID CITRIC

Indications: Catheter Maintenance Solution, 'Solution R'

- *Uro-Tainer Solution R,*
- *Uriflex R: Citric Acid 6%, Gluconolactone 0.6%, Magnesium Carbonate 2.8%, Disodium Edetate 0.01*%

DRUGS FOR ERECTILE DYSFUNCTION

SILDENAFIL

Sildenafil is a phosphodiesterase type-5 inhibitors licensed for the treatment of erectile dysfunction; they are not recommended for use with other treatments for erectile dysfunction.

Indications: treatment of erectile dysfunction

Cautions: hypotension (avoid if systolic blood pressure below 90 mmHg); intravascular volume depletion; left ventricular outflow obstruction; cardiovascular disease; autonomic dysfunction; pulmonary venoocclusive disease; anatomical deformation of the penis, predisposition to priapism; bleeding disorders or active peptic ulceration; consider gradual withdrawal; interactions should be used with caution in cardiovascular disease, left ventricular outflow obstruction, anatomical deformation of the penis (e.g. angulation, cavernosal fibrosis, Peyronie's disease), and in those with a predisposition top riapism (e.g. in sickle-cell disease, multiple myeloma, or leukaemia). Concomitant treatment with aphosphodiesterase type-5 inhibitor and an alpha-blocker can increase the risk of postural hypotension—initiate treatment with a phosphodiesterasetype-5 inhibitor (at a low dose) only once the patient is stable on the alpha-blocker

Note: not recommended for use with other treatments for erectile dysfunction. The patient should be assessed appropriately before prescribing sildenafil.

Contra-indications: recent history of stroke or myocardial infarction, history of non-arteritic anterior ischaemic optic neuropathy; hereditary degenerative retinal disorders; sickle-cell anaemia; avoid concomitant use of nitrates

Hepatic impairment: for pulmonary hypertension, if usual dose not tolerated, reduce oral dose to 20mgtwice daily, or reduce intravenous dose to 10mg twice daily; manufacturer advises avoid in severe impairment
Renal impairment: for pulmonary hypertension, if usual dose not tolerated, reduce oral dose to 20mg twice daily, or reduce intravenous dose to 10mg twice daily
Pregnancy: use only if potential benefit outweighs risk—no evidence of harm in animal studies
Breast-feeding: manufacturer advises avoid - no information available
Side Effects: dyspepsia, nausea, vomiting, headache (including migraine), flushing, dizziness, myalgia, back pain, visual disturbances (non-arteritic anterior ischaemic optic neuropathy has been reported—stop drug if sudden visual impairment occurs), and nasal congestion. Less common side effects include painful red eyes, palpitation, tachycardia, hypotension, hypertension, epistaxis. Other side effects: reported rarely include syncope, hypersensitivity reactions (including rash, facial oedema, and Stevens-Johnson syndrome), and priapism. Serious cardiovascular events (including arrhythmia, unstable angina, and myocardial infarction), seizures, sudden hearing loss (discontinue drug and seek medical advice), and retinal vascular occlusion have also been reported.
Dose: ADULT over 18 years initially 50mg approx. 1 hour before sexual activity, subsequent doses adjusted according to response to 25–100mg as a single dose as needed; max. 1 dose in 24 hours (max. single dose100 mg) Onset of effect may be delayed if taken with food

- *Viagra 50 mg Tablets ,*

8 - MALIGNANT DISEASE & IMMUNOSUPRESSION

ALKYLATING AGENTS

CHLORAMBUCIL

This is a bifunctional alkylating agent of the nitrogen mustard type.
Indications: chronic lymphocytic leukemia, malignant lymphomas including Hodgkin's disease, lymphosarcoma, giant follicular lymphoma.
Cautions: Hepatic impairment; porphyria.
Contra-indications: When rashes develop, discontinue drug and cyclophosphamide is substituted.
Side effect: bone marrow suppression; rarely severe rashes which may progress to Stevens - Johnson syndrome or toxic epidermal necrolysis.
Dose: Alone 5 – 10mg (200 mcg/kg)daily for 4 – 8 weeks; maintenance – 2 – 4mg daily.

- *Leukeran 2mg Tablet*

CYCLOPHOSPHAMIDE

This is a synthetic antineoplastic drug chemically related to the nitrogen mustards.
Indications: chronic lymphocytic leukaemia, lymphomas, and solid tumours; rheumatoid arthritis.
Cautions: reduce dose in renal impairment; increased fluid intake for 24 to 48 hours to avoid haemorrhagic cystitis.
Contra-indications: Severe bone-marrow depression; pregnancy & breast feeding.
Side effect: myelosuppression, alopecia, nausea and vomiting, haemorragic cystitis (absolute withdrawal of treatment)
Dose: According to individual protocol.
Children
In SLE***:*** IV 500 – 750mg/m^2 every month. Max. 1 g/ m^2
JRA/Vasculitis***:*** IV 10mg/kg every 2 weeks.
Children and adults***:***

Oral*:* 500–750mg/$m^{2/}$day as continuous therapy or 400 – 1000mg/ m^2 in divided doses over 4–5 days as intermittent therapy.
IV*:* Single doses*:* 400–1800mg /m^2 (30–50mg/kg) per treatment course (1-5 days) which can be repeated at 2–4 week intervals.
Continuous daily doses*:* 60 – 120mg/m^2 (1–2.5mg/kg) per day.

- *Endoxan 50mg Tablets*
- *Endoxan 200mg & 1g Vial For Injection*

IFOSFAMIDE

This is an alkylating agent with properties similar to those of cyclophosphamide.
Indications: solid tumours of lung, ovary, cervix, breast, thymus and testis; soft tissue sarcoma; osteosarcoma; malignant lymphomas; carcinoma of the pancreas; head and neck tumours.
Cautions: should be administered in association with mesna, and adequate hydration should be maintained to avoid urological toxicity; fluid intake should not be less than 2 litres daily.
Contra-indications: hepatic impairment; hypersensitivity to ifosfamide, bone-marrow aplasia, myelosuppression; infections; pregnancy; breast-feeding.
Side effect: As for cyclophosphamide; amenorrhoea; azoospermia; potential risk to future progeny; mutagenic, teratogenic and carcinogenic properties.
Dose: According to individual protocol.
Children*:*
1200-1800mg/$m^{2/}$day for 3-5 days every 3-4 weeks or 5 g/m^2 once every 3- 4 weeks or 3 g/m^2 for 2 days every 3-4 weeks.
Adults*:* 50mg/kg /day or 700-2000mg /m^2/day for 5 days every 3-4 weeks or 2400mg/$m^{2/}$day for 3 days every 3- 4 weeks or 5000mg /m^2 as single dose every 3-4 weeks.

- *Mitoxana 1g- Vials For Injection*

IMATINIB

Imatinib is known as a signal transductase inhibitor, because it blocks the 'grow' signal. The chemical it blocks

is called tyrosine kinase, so imatinib is also known as a tyrosine kinase inhibitor.
Indications: chronic myeloid leukaemia (CML), and a rare type of cancer known as gastro-intestinal stromal tumour (GIST)
Cautions: pregnancy
Contra-indications: breast feeding
Side effect: Most common side effects include Nausea, Diarrhoea, Headaches, Leg aches/cramps, Fluid retention, Visual disturbances, Itchy rash, Lowered resistance to infection due to leucopenia, reduced platelets, Anaemia, Loss of appetite, abdominal pain, myalgia, gynaecomastia
Dose: 400 to 800mg daily given as single dose with meals with lot of fluids.

- *Glivec Tablet 100mg, 400mg*

MELPHALAN

This is an antineoplastic drug that act as a bifunctional alkylating agent.
Indications: multiple myeloma; advanced ovarian adenocarcinoma, advanced breast cancer, childhood neuroblastoma and polycythaemia vera.
Cautions: reduce dose in renal failure; not to be taken with food (bioavailability is reduced by food).
Contra-indications: pregnancy; breast feeding.
Side effect: bone-marrow depression; hypersensitivity reactions (anaphylaxis); gastro intestinal disturbances; interstitial pneumonitis; pulmonary fibrosis; carcinogenic, mutagenic and teratogenic potential.
Dose: By mouth***:*** ***Dose*** may vary according to regimen;
Multiple myeloma***:*** Typical dose 150 mcg /kg daily for 4 weeks, repeated every 6 weeks.
Ovarian adrenocarcinoma***:*** 200 mcg /kg daily for 5 days, repeated every 4-8 weeks.
Advanced breast cancer***:*** 150 mcg /kg daily for 5 days, repeated every 6 weeks.
Polycythaemia vera***:*** initially 6-10mg daily reduced after 5-7 days to 2-4mg daily until satisfactory response then further reduce to 2-6mg per week.

- *Alkeran 2mg Tablet*

CETUXIMAB

A Monoclonal Antibody

Indications: Treatment of KRAS mutation-negative (wild-type), EGFR-expressing metastatic colorectal cancer (in combination with FOLFIRI [irinotecan, fluorouracil, and leucovorin] as first-line treatment, in combination with irinotecan [in patients refractory to irinotecan-based chemotherapy], or as a single agent in patients who have failed oxaliplatin and irinotecan based chemotherapy or who are intolerant to irinotecan); treatment of squamous cell cancer of the head and neck (as a single agent for recurrent or metastatic disease after platinum-based chemotherapy failure; in combination with radiation therapy as initial treatment of locally or regionally advanced disease; in combination with platinum and fluorouracil-based chemotherapy as first-line treatment of locoregional or metastatic disease)

Note***:*** Cetuximab is not indicated for the treatment of KRAS mutation-positive colorectal cancer.

Cautions: cardiovascular disease, cardiopulmonary disease, pulmonary disease—discontinue if interstitial lung disease; history of, or risk factors for keratitis, ulcerative keratitis (including contact lens use), or severe dry eye

Contra-indications: RAS mutated colorectal tumours (or if RAS tumour status unknown)

Pregnancy: use only if potential benefit outweighs risk—no information available

Breast-feeding: avoid breast-feeding during and for 2 months after treatment—no information available

Side Effects: infusion-related reactions including dyspnea, dizziness, chills, fever, and severe (sometimes fatal) hypersensitivity reactions (possibly delayed onset) such as rash, urticaria, bronchospasm, hypotension, hypertension, and shock; nausea, vomiting, diarrhoea, headache, aseptic meningitis, hypomagnesaemia, hypocalcaemia, conjunctivitis, blepharitis, keratitis, skin reactions including acne, pruritus, dry skin, desquamation, hypertrichosis, nail disorders; very rarely Stevens-Johnson syndrome, toxic epidermal necrolysis

Dose:

Note***:*** Premedicate with an H_1 antagonist (eg, diphenhydramine) IV 30-60 minutes prior to the first

dose; premedication for subsequent doses is based on clinical judgement.
Colorectal cancer, metastatic, KRAS mutation-negative (wild-type)*:* IV*:*
Initial loading dose 400 mg/m^2 infused over 120 minutes
Maintenance dose 250 mg/m^2 infused over 60 minutes weekly until disease progression or unacceptable toxicity
Note*:* If given in combination with (irinotecan, fluorouracil, and leucovorin), complete cetuximab infusion 1 hour prior to (irinotecan, fluorouracil, and leucovorin).
Head and neck cancer (squamous cell) (IV):
Initial loading dose 400 mg/m^2 infused over 120 minutes
Maintenance dose 250 mg/m^2 infused over 60 minutes weekly
Note*:* If given in combination with radiation therapy, administer loading dose 1 week prior to initiation of radiation course; weekly maintenance dose should be completed 1 hour prior to radiation for the duration of radiation therapy (6-7 weeks). If given in combination with chemotherapy, administer loading dose on the day of initiation of platinum and fluorouracil-based chemotherapy, cetuximab infusion should be completed 1 hour prior to initiation of chemotherapy; weekly maintenance dose should be completed 1 hour prior to chemotherapy; continue until disease progression or unacceptable toxicity. Monotherapy weekly doses should be continued until disease progression or unacceptable toxicity
Colorectal cancer, advanced, biweekly administration (unlabeled dosing) IV*:* 500 mg/m^2 every 2 weeks (initial dose infused over 120 minutes, subsequent doses infused over 60 minutes) in combination with irinotecan non small cell lung cancer (NSCLC), EGFR-expressing, advanced (unlabeled use) IV
Initial loading dose 400 mg/m^2, followed by maintenance dose 250 mg/m^2 weekly in combination with cisplatin and vinorelbine for up to 6 cycles, then as monotherapy until disease progression or unacceptable toxicity.
Squamous cell skin cancer, unrespectable (unlabeled use) IV*:* Initial loading dose 400 mg/m^2, followed by maintenance dose 250 mg/m^2 weekly until disease progression

- *Erbitux 100 mg vial*

DENOSUMAB

Bone-Modifying Agent; Monoclonal Antibody
Indications: Tumors :
Prevention of skeletal-related events (eg, fracture, spinal cord compression, bone pain requiring surgery/radiation therapy) in patients with bone metastases from solid tumors.
treatment of giant cell tumor of the bone in adults and skeletally mature adolescents that is unresectable or where surgical resection is likely to result in severe morbidity
Note***:*** NOT indicated for prevention of skeletal-related events in patients with multiple myeloma
Note***:*** Duplicate therapy issues***:*** Prolia contains denosumab, which is the same ingredient contained in Xgeva; patients receiving Xgeva should not be treated with Prolia
Contra-indications: Hypersensitivity to denosumab or any component of the formulation; preexisting hypocalcemia.
Renal impairment: increased risk of hypocalcaemia if eGFR less than 30 ml/minute/1.73 m^2—monitor plasma-calcium concentration
Pregnancy: avoid
Breast-feeding: avoid
Side Effects: diarrhoea, constipation, dyspnea, urinary tract infection, upper respiratory tract infection, pain in extremity, sciatica, hypocalcaemia (fatal cases reported), hypophosphataemia, cataracts, rash, sweating; less commonly diverticulitis, cellulitis (seek prompt medical attention), ear infection; rarely osteonecrosis of the jaw, atypical femoral fractures.
Dose: Note***:*** Administer calcium and vitamin D as necessary to prevent or treat hypocalcemia
Prevention of skeletal-related events in bone metastases from solid tumors SubQ***:*** 120 mg every 4 weeks.
Treatment of giant cell tumor of the bone (Xgeva)***:*** SubQ***:*** 120 mg once every 4 weeks; during the first month, give an additional 120 mg on days 8 and 15.

- *Xgeva sc inj 120mg*

RITUXIMAB

This is a monoclonal antibody which causes lysis of B lymphocytes

Indications: Chemotherapy resistant advanced follicular lymphoma of stage III or IV; diffuse large B- cell non – Hodgkins lymphoma in combination with other chemotherapy; advanced follicular lymphoma with other chemotherapeutic agents.

Cautions: In patients receiving cardiotoxic chemotherapy or history of cardiovascular disease because exacerbation of angina, arrhythmia, heart failure has been reported.

Contra-indications: breast feeding

Side effect: Infusion-related side effects (including cytokine release syndrome) like chills, fever, nausea, vomiting, hypersensitivity reactions such as anaphylaxis, urticaria, bronchospasm, dyspnea and angioedema, flushing & tumour pain; Severe cytokine release syndrome (characterized by severe dyspnea) and associated with features of tumour lysis syndrome have occurred 1-2 hours after infusion.

Dose: 375mg/meter squared once a week for 4 infusions if given as monotherapy and 8 if given with chemotherapy.

- *Mabthera 100mg & 500mg vial*

TEMOZOLAMIDE

Indications: Anaplastic astrocytoma: Treatment of refractory anaplastic astrocytoma (refractory to a regimen containing a nitrosourea and procarbazine). Glioblastoma multiforme: Treatment of newly-diagnosed glioblastoma multiforme (initially in combination with radiotherapy, then as maintenance treatment)

Cautions: Pneumocystis jiroveci pneumonia— for monitoring and prophylaxis requirements. monitor liver function before treatment initiation, after each treatment cycle and midway through 42-day treatment cycles—consider the balance of benefits and risks of treatment if results are abnormal at any point (fatal liver injury reported). monitor for myelodysplastic syndrome and secondary malignancies.

Note: This medication is in a class the Institute for Safe Medication Practices (ISMP) includes among its list of drug classes which have a heightened risk of causing significant patient harm when used in error.
CHILD under 3 years not recommended
Contra-indications: Hypersensitivity (eg, allergic reaction, anaphylaxis, urticaria, Stevens-Johnson syndrome, toxic epidermal necrolysis) to temozolomide or any component of the formulation.
hypersensitivity to dacarbazine (both drugs are metabolized to MTIC)
Canadian labeling: Additional contraindications (not in U.S. labeling): Not recommended in patients with severe myelosuppression
Side Effects: Note: With CNS malignancies, it may be difficult to distinguish between CNS adverse events caused by temozolomide versus the effects of progressive disease. >10%: Cardiovascular: Peripheral edema, Central nervous system: Fatigue, headache, seizure, hemiparesis, fever, dizziness, coordination abnormality, Dermatologic: Alopecia, rash, Gastrointestinal: Nausea, vomiting: constipation, anorexia, diarrhea, Hematologic: Lymphopenia (grades 3/4:, thrombocytopenia (grades 3/4: adults: 4% to 19%; children:, neutropenia (grades 3/4: adults: 8% to 14%; children:, leukopenia (grades 3/4: , Neuromuscular & skeletal: Weakness, Miscellaneous: Viral infection, Central nervous system: Amnesia, insomnia, somnolence, ataxia, paresis, anxiety, memory impairment, depression, confusion, Dermatologic: Pruritus, dry skin, radiation injury (2% maintenance phase after radiotherapy), erythema, Endocrine & metabolic: Hypercorticism, breast pain (females 6%) Gastrointestinal: Stomatitis, abdominal pain, dysphagia, taste perversion, weight gain, Genitourinary: Incontinence, urinary tract infection, urinary frequency, Hematologic: Anemia Neuromuscular & skeletal: Paresthesia, back pain, abnormal gait, arthralgia, myalgia, Ocular: Blurred vision, diplopia, vision abnormality (visual deficit/vision changes) Respiratory: Pharyngitis, upper respiratory tract infection, cough, sinusitis, dyspnea, Miscellaneous: Allergic reaction (Limited to important or life-threatening): Alkaline phosphatase increased, alveolitis, anaphylaxis, aplastic anemia,

cholestasis, emotional lability, erythema multiforme, febrile neutropenia, flu-like syndrome, hallucination, hematoma, hemorrhage, hepatitis, hepatotoxicity, herpes simplex, herpes zoster, hyperbilirubinemia, hyperglycemia, hypokalemia, injection site reactions (erythema, irritation, pain, pruritus, swelling, warmth), interstitial pneumonia/pneumonitis, myelodysplastic syndrome, opportunistic infection (eg, PCP), oral candidiasis, pancytopenia (may be prolonged), peripheral neuropathy, petechiae, pneumonitis, pulmonary fibrosis, secondary malignancies (including myeloid leukemia), Stevens-Johnson syndrome, toxic epidermal necrolysis, transaminases increased.

Dose: Adult:

Note**:** Temozolomide is associated with a moderate emetic potential (Roila, 2010); antiemetics are recommended to prevent nausea and vomiting. Prior to dosing, ANC should be ≥1500/mm^3 and platelets ≥100, 000/mm^3. Anaplastic astrocytoma (refractory)**:** Oral, IV**:** Initial dose 150 mg/m^2 once daily for 5 consecutive days of a 28-day treatment cycle. If ANC ≥1500/mm^3 and platelets ≥100, 000/mm^3, on day 1 of subsequent cycles, may increase to 200 mg/m^2 once daily for 5 consecutive days of a 28-day treatment cycle. May continue until disease progression.

Dosage modification for toxicity:

ANC <1000/mm^3 or platelets <50, 000/mm^3 on day 22 or day 29 (day 1 of next cycle)**:** Postpone therapy until ANC >1500/mm^3 and platelets >100, 000/mm^3. reduce dose by 50 mg/m^2/day (but not below 100 mg/m^2) for subsequent cycle. ANC 1000-1500/mm^3 or platelets 50, 000-100, 000/mm^3 on day 22 or day 29 (day 1 of next cycle)**:** Postpone therapy until ANC >1500/mm^3 and platelets >100, 000/mm^3; maintain initial dose Glioblastoma multiforme (newly diagnosed, high-grade glioma)**:** Oral, IV**:** Concomitant phase**:** 75 mg/m^2/day for 42 days with focal radiotherapy (60 Gy administered in 30 fractions).

Note**:** PCP prophylaxis is required during concomitant phase and should continue in patients who develop lymphocytopenia until lymphocyte recovery to ≤grade 1. Obtain weekly CBC. Continue at 75 mg/m^2/day throughout the 42-day concomitant phase (up to 49 days) as long as ANC ≥1500/mm^3, platelet count ≥100,

000/mm^3, and non hematologic toxicity ≤grade 1 (excludes alopecia, nausea/vomiting) Dosage modification for toxicity**:** ANC ≥500/mm^3 but <1500/mm^3 or platelet count ≥10, 000/mm^3 but <100, 000/mm^3 or grade 2 non hematologic toxicity (excludes alopecia, nausea/vomiting)**:** Interrupt therapy ANC <500/mm^3 or platelet count <10, 000/mm^3 or grade 3/4 non hematologic toxicity (excludes alopecia, nausea/vomiting)**:** Discontinue therapy. Maintenance phase (consists of 6 treatment cycles)**:** Begin 4 weeks after concomitant phase completion.
Note**:** Each subsequent cycle is 28 days (consisting of 5 days of drug treatment followed by 23 days without treatment). Draw CBC within 48 hours of day 22; hold next cycle and do weekly CBC until ANC >1500/mm^3 and platelet count >100, 000/mm^3; dosing modification should be based on lowest blood counts and worst non hematologic toxicity during the previous cycle.
Cycle 1**:** 150 mg/m^2 once daily for 5 days of a 28-day treatment cycle. Cycles 2-6**:** May increase to 200 mg/m^2 once daily for 5 days. repeat every 28 days (if ANC ≥1500/mm^3, platelets ≥100, 000/mm^3 and non hematologic toxicities for cycle 1 are ≤grade 2 [excludes alopecia, nausea/vomiting]).
Note**:** If dose was not escalated at the onset of cycle 2, do not increase for cycles 3-6) Dosage modification (during maintenance phase) for toxicity**:** ANC <1000/mm^3, platelet count <50, 000/mm^3, or grade 3 non hematologic toxicity (excludes alopecia, nausea/vomiting) during previous cycle**:** Decrease dose by 1 dose level (by 50 mg/m^2/day for 5 days), unless dose has already been lowered to 100 mg/m^2/day, then discontinue therapy. If dose reduction <100 mg/m^2/day is required or grade 4 non hematologic toxicity (excludes alopecia, nausea/vomiting), or if the same grade 3 non hematologic toxicity occurs after dose reduction**:** Discontinue therapy Glioblastoma multiforme (recurrent glioma)**:** Canadian labeling (unlabeled use in the U.S.)**:** 200 mg/m^2/day for 5 days every 28 days; if previously treated with chemotherapy, initiate at 150 mg/m^2/day for 5 days every 28 days and increase to 200 mg/m^2/day for 5 days every 28 days with cycle 2 if no hematologic toxicity (Brada, 2001; Yung, 2000) Cutaneous T-cell lymphoma, advanced

(mycosis fungoides [MF] and Sézary syndrome [SS]; unlabeled use)**:** Oral**:** 200 mg/m^2 once daily for 5 days every 28 days for up to 1 year (Querfeld, 2011) Ewing's sarcoma, recurrent or progressive (unlabeled use)**:** Oral**:** 100 mg/m^2/dose days 1 to 5 every 21 days (in combination with irinotecan) (Casey, 2009). Additional data may be necessary to further define the role of temozolomide in this condition Melanoma, advanced or metastatic (unlabeled use)**:** Oral**:** 200 mg/m^2/day for 5 days every 28 days (for up to 12 cycles). For subsequent cycles reduce dose to 75% of the original dose for grade 3/4 hematologic toxicity and reduce the dose to 50% of the original dose for grade 3/4 non hematologic toxicity (Middleton, 2000). Neuroendocrine tumors, advanced

- *Temozolamide Tablets 100mg*

ANTIMETABOLITES

CAPECITABINE

This is a prodrug that is converted to fluorouracil in body tissues following oral administration.
Indications: it is given by mouth for the treatment of metastatic breast and colorectal cancer.
Cautions: should be used with care in patients with renal impairment; doses should be reduced in moderate renal impairment.
Contra-indications: in patients with severe hepatic and renal impairment (creatinine clearance below 30ml/minute); pregnancy; breast feeding.
Side effect: diarrhoea, nausea and vomiting, stomatitis, palmer-plantar syndrome (erythema and desquamation of hands and feet), dermatitis, and bone-marrow depression have all been reported. Hyperbilirubinaemia has occurred.
Dose: Adult over 18 years, 1.25 g/m^2 twice daily for 14 days; subsequent courses repeated after a 7-day interval.

- *Xeloda 500mg Tablet*

CYTARABINE

Cytarabine, a pyrimidine nucleoside analogue, is an antimetabolite antineoplastic, which inhibits the synthesis of DNA.

Indications: induction of remission of acute myeloblastic leukaemia.
Cautions: severe myelosuppression; careful hematological monitoring is necessary.
Contra-indications: Pregnancy & breast feeding
Side Effects: myelosuppression (particularly granulocytopenia); gastrointestinal disturbances; hepatic dysfunction; renal dysfunction; neurotoxicity; bleeding complications; flu-like symptoms
Dose: Remission induction – IV*:* 100-200mg /m^2/ day for 5 -10 days; second course beginning 2-4 weeks after initial therapy, may be required in some cases.
IT - 5-75mg /m^2/ every 2-7 days until CNS findings normalize or age related dosage*:* < 1 year-20mg; 1-2 years-30mg; 2-3 years-50mg; >3 years- 75mg.
Remission maintenance*:* – IV*:* 70-200mg /m^2/ day for 2 -5 days at monthly intervals.
IM. SC*:* 1-1.5mg/kg single dose at 1 to 4 weeks intervals.

- *Cytarabine 100mg & 500mg Vial For Injection*

FLUDARABINE

This is a fluorinated nucleotide analogue of the antiviral vidarabine which acts as a purine antagonist antimetabolite.
Indications: Treatment of advanced B-cell chronic lymphocytic leukaemia for patients who either have failed or are intolerant of, first-line chemotherapy.
Cautions: dosage should be reduced in renal impairment and fludarabine should not be given if creatinine clearance is less than 30ml/minute. It should also be avoided in patients with decompensated haemolytic anaemia.
Contra-indications: Haemolytic anaemia; pregnancy & breast feeding.
Side effect: Myelosuppression which can be severe and cumulative; immuno-suppression is also common and co-trimoxazole is often used to prevent pneumocystis infection. Immune-mediated haemolytic anaemia, thrombocytopenia, and neutropenia are less common side effects.
Dose: By bolus injection or by IV infusion over 30 minutes in a usual dose of 25mg/m^2 body-surface daily

for 5 consecutive days. It may be given by mouth in a dose of 40mg/m^2 daily for 5 consecutive days. Courses may be repeated every 28 days, usually for up to 6 cycles.

- *Fludarabine Phosphate 50mg Inj.*

GEMCITABINE HYDROCHLORIDE

This is an analogue of cytarabine which inhibit DNA synthesis by inhibition of DNA polymerase and ribonucleotide reductase, specific for the S phase of the cycle.

Indications: advanced or metastatic non-small cell lung cancer; locally advanced pancreatic cancer; advanced bladder cancer (in combination with cisplatin).

Cautions: patients with impaired renal or hepatic function; to be discontinued at the first signs of microangiopathic haemolytic anaemia.

Contra-indications: ***pregnancy*** & breast feeding

Side effect: As for cytarabine, myelosuppression; gastro-intestinal disturbances; fever; dyspnea; somnolence (patients should not drive or operate machinery).

Dose: Pancreatic cancer***:*** 1000mg /m^2 over 30 minutes weekly for 3 or 7 weeks followed by 1 week rest; repeat cycles 3 out of every 4 weeks.

non-small cell lung cancer in combination with cisplatin***:*** 1000mg /m^2 over 30 minutes on days 1, 8, 15; repeat every 28 day or 1250mg /m^2 over 30 minutes on days 1, 8; repeat every 21 days.

- *Gemzar 200mg- & 1g- Vials For Injection.*

MERCAPTOPURINE

This, an analogue of the natural purines, hypoxanthine and adenine, is an antineoplastic that act as an antimetabolite. It has also immunosuppressant properties.

Indications: acute leukaemias and chronic myeloid leukaemia.

Cautions: patients with impaired hepatic and renal function; hepatic function should be monitored periodically.

Contra-indications: Pregnancy; breast-feeding.

Side Effects: bone-marrow depression; gastrointestinal toxicities (less toxic than fluorouracil and methotrexate)

Dose: Initially 2.5mg/kg daily.

- *Puri-Nethol 50mg Tablet*

METHOTREXATE

This acts as an antimetabolite of folic acid. It has also immunosuppressant properties.

Indications: maintenance therapy for childhood acute lymphoblastic leukaemia, choricocarcinoma, non-Hodgkin's lymphomas, a number of solid tumours; intrathecal methotrexate is used in the CNS prophylaxis of childhood acute lymphoblastic leukemia, and as a therapy for established meningeal carcinoma or lymphoma.

Cautions: Should be avoided in the presence of significant pleural effusion or ascites because it can accumulate in these fluids, and its subsequent return to the circulation may cause myelosuppression.

Contra-indications: Patients with significant renal and hepatic dysfunction.

Side Effects: bone-marrow suppression (dose-related), gastro-intestinal disturbances (anorexia, nausea, vomiting, and diarrhoea); oral ulceration, stomatitis, pharyngitis; glossitis; gingivitis; hepatotoxicity; interstitial pulmonary fibrosis.

Dose: According to individual protocols. Conventional 15 – 20mg/m^2 orally twice weekly or 30-50mg/m^2 orally/IV weekly or 15mg/day for 5 days orally/IM every 2-3 weeks.

- *Methotexate 2.5mg Tablet*
- *Methotexate 50mg & 500mg Vials For Injection.*

TIOGUANINE (THIOGUANINE)

This is an analogue of the naturally occurring purine, guanine, and is an anti-neoplastic with actions and uses similar to those of mercaptopurine.

Indications: induction of remission and maintenance in acute myeloid leukaemia; acute lymphoblastic leukaemia; chronic myeloid leukaemia.

Cautions: reduce dose in renal failure.

Contra-indications: Pregnancy; breast-feeding.

Side effect: As for mercaptopurine (gastrointestinal side effects are less frequent than mercaptopurine)

Dose: induction 100 - 200mg/m^2 by mouth in 1 – 2 divided doses for 5 – 20 days; maintenance, usually 60 – 200mg/m^2 daily.

- *Lanvis 40mg Tablets.*

CYTOTOXIC DRUGS

DEXRAZOXANE

Cardioprotectant Agents

Indications: Anthracycline- induced cardiotoxicity The anthracycline cytotoxic drugs are associated with dose-related, cumulative, and potentially life-threatening cardiotoxic side effects.

Dexrazoxane, an iron chelator, is licensed for the prevention of chronic cumulative cardiotoxicity caused by doxorubicin or epirubicin treatment in advanced or metastatic breast cancer patients who have received a prior cumulative dose of 300 mg/m^2 of doxorubicin or a prior cumulative dose of 540 mg/m^2 of epirubicin when further anthracycline treatment is required. Patients receiving dexrazoxane should still be monitored for cardiac toxicity. The myelosuppressive effects of dexrazoxane may be additive to those of chemotherapy. The use of dexrazoxane is restricted to adults with advanced or metastatic breast cancer.

Cautions:

●May interfere with activity of antineoplastic drugs; do NOT initiate until cumulative doxorubicin dose reaches 300 mg/m² give doxorubicin prior to dexrazoxane

●Does not eliminate potential for anthracycline-induced cardiactoxicity; monitor cardiac function carefully

Secondary malignancies (eg, AML, MDS) reported with combination chemotherapy.

Dexrazoxane is licensed for the treatment of anthracycline extravasation. The first dose should be given as soon as possible and within six hours after the injury.

Extravasation: Extravasation injury follows leakage of drugs or intravenous fluids from the veins or inadvertent administration into the subcutaneous or subdermal tissue. It must be dealt with promptly to prevent tissue necrosis. Acidic or alkaline preparations and those with an osmolarity greater than that of plasma can cause

extravasation injury; excipients including alcohol and polyethylene glycol have also been implicated.Cytotoxic drugs commonly cause extravasation injury. In addition, certain patients such as the very young and the elderly are at increased risk. Those receiving anticoagulants are more likely to lose blood into surrounding tissues if extravasation occurs, while those receiving sedatives or analgesics may not notice the early signs or symptoms of extravasation.

Prevention of extravasation:

Precautions should be taken to avoid extravasation; ideally, drugs likely to cause extravasation injury should be given through a central line and patients receiving repeated doses of hazardous drugs peripherally should have the cannula resited at regular intervals. Attention should be paid to the manufacturers' recommendations for administration. Placing a glyceryl trinitrate patch distal to the cannula may improve the patency of the vessel in patients with small veins or in those whose veins are prone to collapse. Patients should be asked to report any pain or burning at the site of injection immediately.

Management of extravasation

If extravasation is suspected the infusion should be stopped immediately but the cannula should not be removed until after an attempt has been made to aspirate the area (through the cannula) in order to remove as much of the drug as possible. Aspiration is sometimes possible if the extravasation presents with a raised bleb or blister at the injection site and is surrounded by hardened tissue, but it is often unsuccessful if the tissue is soft or soggy. Corticosteroids are usually given to treat inflammation, although there is little evidence to support their use in extravasation.

Hydrocortisone or dexamethasone can be given either locally by subcutaneous injection or intravenously at a site distant from the injury. Antihistamines and analgesics may be required for symptom relief. The management of extravasation beyond these measures is not well standardised and calls for specialist advice. Treatment depends on the nature of the offending substance; one approach is to localise and neutralise the substance whereas another is to spread and dilute it. The first method

may be appropriate following extravasation of vesicant drugs and involves administration of an antidote (if available) and the application of cold compresses 3–4 times a day (consult specialist literature for details of specific antidotes). Spreading and diluting the offending substance
involves infiltrating the area with physiological saline, applying warm compresses, elevating the affected limb, and administering hyaluronidase A saline flush- out technique (involving flushing the subcutaneous tissue with physiological saline) may be effective but requires specialist advice. Hyaluronidase should not be administered following extravasation of vesicant drugs (unless it is either specifically indicated or used in the saline flush-out technique). Dexrazoxane is licensed for the treatment of anthracycline-induced extravasation.
Hepatic impairment: Monitor liver function
Renal impairment: Use with caution—risk of accumulation; manufacturer of Cardioxane advises reduce dose by 50% if creatinine clearance less than 40 ml/minute
Pregnancy: Avoid unless essential (toxicity in animal studies);
ensure effective contraception during and for at least 3 months after treatment in men and women
Breast-feeding: Discontinue breast-feeding
Contra-indications: -Hypersensitivity -Use in chemotherapy when an anthracycline is not being administered
Side Effects: Nausea, vomiting, dyspepsia, abdominal pain, diarrhoea, stomatitis, dry mouth, anorexia; dyspnea; dizziness, syncope, asthenia, paraesthesia, tremor, fatigue, drowsiness; pyrexia; vaginal haemorrhage; myalgia; blood disorders (including anaemia, leucopenia, neutropenia, thrombocytopenia, and increased myelosuppression); alopecia, pruritus; peripheral oedema, injection-site reactions including phlebitis; also reported secondary malignancies
Dose: Powder for injection •250mg 500mg
For adult:
Doxorubicin-Induced Cardiomyopathy, Prophylaxis (Zinecard/Generic):

10: 1 ratio of dexrazoxane to doxorubicin dose (500 mg/m² dexrazoxane **:** 50 mg/m² doxorubicin) slow IVP or rapid drip IV infusion
Give doxorubicin within 30 minutes of beginning of dexrazoxane infusion
Monitor cardiac function and discontinue combination therapy in patients who develop a decline in left ventricular
ejection fraction or develop clinical congestive failure.
Renal impairment: Moderate-to-severe**:** 5x doxorubicin dose
Anthracycline Extravasation (Totect):
Give first infusion within 6 hr after extravasation
Day 1**:** 1000 mg/m² IV; not to exceed 2000 mg
Day 2**:** 1000 mg/m² IV; not to exceed 2000 mg
Day 3**:** 500 mg/m² IV; not to exceed 1000 mg
Infuse IV over 1-2 hr; begin treatment within 6 hr of extravasation
Renal Impairment: CrCl <40 ml/min**:** Reduce dose by 50%. For pediatric: Safety and efficacy not established
Cardiomyopathy Prophylaxis (Orphan)
Orphan designation for prevention of anthracycline-induced cardiomyopathy in children and adolescents

- *Cardioxane Intravenous infusion, powder for reconstitution, 500-mg vial*

VINDESINE SULFATE

Indications: used to treat a variety of cancers including leukaemias, lymphomas, and some solid tumours (e.g. breast and lung cancer).
Cautions : neuromuscular disease (caution in handling).
Contraindicated: Hypersensitivity to vindesine, vinca alkaloids, or any component of the formulation; intrathecal administration (fatal); demyelinating form of Charcot-Marie-Tooth syndrome; severe granulocytopenia (<1500/mm^3) or severe thrombocytopenia; bacterial infection.
Hepatic impairment dose reduction may be necessary
Pregnancy avoid (teratogenic in animal studies);
Breast-feeding: discontinue breast-feeding
Side Effects: Many side effects of cytotoxic drugs often do not occur at the time of administration, but days or weeks later Most common: Central nervous system:

Pyrexia, malaise. Dermatologic: Alopecia. Gastrointestinal: Mild nausea and vomiting, constipation (related to the neurotoxicity) Hematologic: Leukopenia and thrombocytopenia, may be dose limiting; thrombocytosis. Nadir: 6-12 days Recovery: Days 14-18 Neuromuscular & skeletal: Paresthesia, loss of deep tendon reflexes, myalgia Less common: Dermatologic: Rashes Gastrointestinal: Loss of taste Hematologic: Anemia Local: Phlebitis Neuromuscular & skeletal: Facial paralysis rare (Limited to important or life-threatening): Acute chest pain, ECG changes, paralytic ileus, jaw pain, photophobia.

Doses of cytotoxic drugs are determined using a variety of different methods including body-surface area or body-weight. Alternatively, doses may be fixed. Doses may be further adjusted following consideration of a patient's neutrophil count, renal and hepatic function, and history of previous adverse effects to the cytotoxic drug. Doses may also differ depending on whether a drug is used alone or in combination

- *Eldisine Injection, powder for reconstitution 5-mg vial*

CYTOTOXIC ANTIBIOTICS

BLEOMYCIN (Systemic)

Bleomycin is a mixture of cytotoxic glycopeptide antibiotics isolated from a strain of Streptomyces verticillus.

Indications: squamous cell carcinoma, lymphomas (Hodgkin's disease, non-Hodgkin's lymphoma); testicular carcinoma.

Cautions: in patients with significant impairment of renal function or compromised pulmonary function. Because of the possibility of an anaphylactoid reaction (idiosyncratic reaction), lymphoma patients should be treated with 2 units or less for the first two doses. If no acute reaction occurs, then the regular dosage schedule may be followed.

Contra-indications: pregnancy & breast feeding

Side effect: Pulmonary toxicities in 10% of the treated patients (pneumonitis progresses to pulmonary fibrosis).

An idiosyncratic reaction in 1% of the lymphoma patients treated with bleomycin has been reported. It consists of hypotension, mental confusion, fever, chills and wheezing (anaphylactic reaction).

- *Bleomycin Injection 15000 Units/Vial*

CRISANTASPASE

Indications: Acute Lymphoblastic Leukemia (in combination with other chemotherapy) in patients with hypersensitivity to *E. coli*-derived asparagines.
Cautions: since its given intramuscularly, intravenously, or subcutaneously almost exclusively in acute lymphoblastic leukaemia. Facilities for the management of anaphylaxis should be available.
Contra-indications: History of serious hypersensitivity reactions, including anaphylaxis to asparaginase or any component of the formulation. history of serious pancreatitis, serious thrombosis, or serious hemorrhagic event with prior asparaginase treatment
Pregnancy: Most cytotoxic drugs are teratogenic and should not be administered during pregnancy, especially during the first trimester. Exclude pregnancy before treatment with cytotoxic drugs. Considerable caution is necessary if a pregnant woman presents with cancer requiring chemotherapy, and specialist advice should always be sought. (Use during pregnancy only if clearly needed).
Breast-feeding: discontinue breast-feeding
Renal Impairment: There are no dosage adjustments provided in the manufacturer's labeling.
Hepatic Impairment There are no dosage adjustments provided in the manufacturer's labeling.
Pancreatitis: Pancreatitis reported during clinical trials: Discontinue drug for severe or hemorrhagic pancreatitis manifested by abdominal pain >72 hr and amylase elevation 2.0 x ULN or more. Mild pancreatitis: hold drug until signs and symptoms subside, and amylase levels return to normal; after resolution, treatment may resume.
Side Effects: Most common: Hypersensitivity: Hypersensitivity reaction (includes anaphylaxis, urticaria) Less common: Cardiovascular: Thrombosis. Endocrine & metabolic: Decreased glucose tolerance,

hyperglycemia. Gastrointestinal: Pancreatitis, nausea, vomiting, abdominal pain, diarrhea. Hepatic: Abnormal transaminase, hyperbilirubinemia. Local: Injection site reaction. Miscellaneous: Fever. Rare: (Limited to important or life-threatening): Acute renal failure, anorexia, bone marrow depression (very rare), changes in serum lipids, disseminated intravascular coagulation, hemorrhage, hepatomegaly, hyperammonemia, increased alkaline phosphatase, malabsorption syndrome, seizure, transient ischemic attacks, weight loss.
Dose*:* Adult Acute lymphoblastic leukemia (ALL): IM: As a substitute for pegaspargase: 25, 000 units/m^2 3 times weekly (Mon, Wed, Fri) for 6 doses for each planned pegaspargase dose. As a substitute for asparaginase (E. coli): 25, 000 units/m^2 for each planned asparaginase (*E. coli*) dose ALL induction: Canadian labeling (not in the U.S. labeling): SubQ: 10, 000 units/m^2 days 1, 3, and 5 of week 4 and day 1 of week 5 (in combination with prednisolone, vincristine, mercaptopurine, and methotrexate) or 10, 000 units/m^2 3 times weekly (starting week 4) for 4 weeks (in combination with prednisolone, vincristine, and daunorubicin).
Acute lymphoblastic leukemia (ALL): IM: Refer to adult dosing. ALL induction: Canadian labeling (not in the U.S. labeling): Children <14 years: IM: 6000 units/m^2 3 times weekly for 9 doses beginning day 4 of week 1 (in combination with vincristine, prednisone, methotrexate, and daunorubicin). Children >14 years: SubQ: Refer to adult dosing

- *Erwinase Injection, powder for reconstitution 10000-unit vial*

DACTINOMYCIN (Actinomycin D))

This is a highly toxic antibiotic with antineoplastic properties.
Indications: Treatment of paediatric cancers.
Cautions: Caution in handling – irritant to tissues
Contra-indications: pregnancy***:*** & breast feeding
Side effect: nausea and vomiting, myelosuppression, supraventricular arrhythmias, alopecia and mucositis.

- *Cosmegen Lyovac 500- mcg Vial*

DAUNORUBICIN (Daunomycin; Rubidomycin)

This is an antineoplastic anthracycline antibiotic closely related to doxorubicin.
Indications: induce remission in acute leukaemia.
Cautions: caution in handling - irritant to tissues; renal impairment; hepatic impairment (dose adjustment is necessary).
Contra-indications: ***pregnancy*** & breast feeding.
Side effect: subcutaneous extravasation may cause severe local reaction like phlebitis; bone marrow depression; cardiotoxicity; gastrointestinal side-effect; loss of scalp hair.

- *Daunorubicin 20mg Vial For Injection.*

DOXORUBICIN HYDROCHLORIDE

This is an anthracycline antineoplastic antibiotic.
Indications: acute leukaemias, lymphomas, and a variety of solid tumours.
Cautions: caution in handling - irritant to tissues. Limit total doses administered to 450-550mg/m^2 body-surface area in one or more courses as symptomatic and potentially fatal heart failure occurs increasingly commonly above this level. Patients with pre-existing cardiac disease, the elderly, and those who have received myocardial irradiation should be treated cautiously. Cardiac functions should be monitored during treatment.
Contra-indications: Patients with heart diseases; It should be given with great care in reduced doses in patients with hepatic impairment; pregnancy***:*** & breast feeding
Side effect: rarely supraventricular tachycardia; cardiomyopathy with cumulative high doses; bone-marrow depression which may be dose-limiting.

- *Adriamycin Vials 10mg & 50mg Vials For Injection.*

EPIRUBICIN HYDROCHLORIDE

This is an anthracycline antibiotic with antineoplastic actions similar to those of doxorubicin (structurally – related to doxorubicin).

Indications: acute leukaemias, lymphomas, multiple myeloma, solid tumours including cancer of bladder, breast, cervix and gastrointestinal tract.
Cautions: reduce dose in hepatic impairment; irritant to tissues.
Contra-indications: ***pregnancy*** & breast feeding
Side effect: cardiotoxcity and myelotoxicity is more likely when the cumulative dose exceeds 0.9 to 1 g per m^2 body-surface.

- *Farmorubicin 10- & 50-mg Vials For Injection.*

IDARUBICIN HYDROCHLORIDE

This is an anthracycline antibiotic with antineoplastic actions similar to those of doxorubicin.
Indications: induction of remission in patients with acute myeloid leukaemias; acute lymphoblastic leukaemia (second-line treatment); advanced breast cancer.
Cautions: caution in handling – irritant to tissues; hepatic and renal impairment.
Contra-indications: ***pregnancy*** & breast feeding; severe renal and liver impairment; pregnancy and breast-feeding.
Side Effects: as for doxorubicin hydrochloride. Raised liver enzyme and bilirubin.

- *Zavedos 5- & 10-mg Vials For Injection*

MITOMYCIN

This is a highly cytotoxic antibiotic with antineoplastic properties.
Indications: IV for upper gastro-intestinal and breast cancers; and by bladder instillation for superficial bladder tumors.
Cautions: hepatic and renal impairment; caution in handling irritant to tissues; renal function should be tested before the beginning of treatment and after each course.
Contra-indications: Patients with impaired renal function or coagulation disorders; pregnancy & breast feeding.
Side effect: prolonged use may result in permanent marrow damage; renal damage and lung fibrosis; fatal haemolytic – uraemic syndrome.

- *Mitomycin C Kyowa 10mg, 20mg Vial For Injection.*

MITOXANTRONE

Indications:

1. is structurally related to doxorubicin; it is used for metastatic breast cancer. Mitoxantrone is also licensed for treatment of non- Hodgkin's lymphoma, adult acute non-lymphocytic leukaemia, and non- resectable primary hepatocellular carcinoma.

It is given intravenously and is well tolerated, but myelosuppression and dose-related cardiotoxicity occur; cardiac examinations are recommended after a cumulative dose of 160 mg/ m^2.

2.Secondary Progressive Multiple Sclerosis

3. Prostate Cancer

Cautions: The drug should be administered under the supervision of an experienced cancer chemotherapy physician in a facility equipped to manage complications Administer slowly into a freely flowing intravenous infusion and never administer IM, SC, or intra-arterially or intrathecally

Severe injury with permanent sequelae can result from intrathecal administration. Severe local tissue damage can occur if extravasation occurs during administration

Do not administer therapy to patients with baseline neutrophil counts <1, 500 cells/ mm^3. Perform peripheral blood cell counts to monitor the occurrence of bone marrow suppression, primarily neutropenia, that may be severe and result in infection

Cardiotoxicity

●Potentially fatal CHF may occur either during therapy or months to years after termination of therapy. The risk increases with cumulative doses and may occur whether or not cardiac risk factors are present. History of cardiovascular disease, radiotherapy to the mediastinal/ pericardial area, previous therapy with other anthracyclines or anthracenediones, or the use of other cardiotoxic drugs may increase the risk

●To mitigate the cardiotoxicity risk with this agent, prescribers should consider the following

●All patients should be assessed for cardiac signs and symptoms by history, physical examination, ECG prior to the start of therapy, and have a baseline evaluation of left ventricular ejection fraction (LVEF) using appropriate

methodology (eg, echocardiogram, multi-gated radionuclide angiography [MUGA])
●Patients with multiple sclerosis (MS) should be assessed for cardiac signs and symptoms by history, physical examination, and ECG prior to each dose. Patients with a baseline LVEF below the lower limit of normal should not be treated with mitoxantrone. Patients with MS should undergo quantitative reevaluation of LVEF prior to each dose using the same methodology that was used to assess baseline LVEF
●Additional doses of mitoxantrone should not be administered to patients with MS who have experienced either a drop in LVEF to below the lower limit of normal or a clinically significant
reduction in LVEF during mitoxantrone therapy. These patients should not receive a cumulative dose >140 mg/sq.meter and should undergo yearly quantitative LVEF evaluation after stopping mitoxantrone to monitor for late occurring cardiotoxicity Secondary acute myelogenous leukemia
●Secondary AML has been reported in patients with MS and cancer who treated with mitoxantrone. Also seen when patients are treated concurrently with anthracyclines. Mitoxantrone is an anthracenedione, a related drug
●The occurrence of refractory secondary leukemia is more common when anthracyclines are given in combination with DNA- damaging antineoplastic agents, when patients have been heavily pretreated with cytotoxic drugs, or when doses of anthracyclines have been escalated
-Not indicated for primary progressive MS
-Risk of cardiotoxicity & secondary AML
-If extravasation occurs, stop immediately & restart in another vein
Hepatic impairment: use with caution
Pregnancy: avoid manufacturer advises effective contraception during and for at least 6 months after treatment in men or women. Most cytotoxic drugs are teratogenic and should not be administered during pregnancy, especially during the first trimester. Exclude pregnancy***:*** before treatment with cytotoxic drugs. Considerable caution is necessary if a pregnant woman

presents with cancer requiring chemotherapy, and specialist advice should always be sought.Contraceptive advice should be given to men and women before cytotoxic therapy begins (and should cover the duration of contraception required after therapy has ended).Regimens that do not contain an alkylating drug or procarbazine may have less effect on fertility, but those with an alkylating drug or procarbazine carry the risk of causing permanent male sterility (there is no effect on potency). Pretreatment counselling and consideration of sperm storage may be appropriate. Women are less severely affected, though the span of reproductive life may be shortened by the onset of a premature menopause. No increase in fetal abnormalities or abortion rate has been recorded in patients who remain fertile after cytotoxic chemotherapy.

Breast-feeding: discontinue breast- feeding

Contra-indications: Hypersensitivity

Side Effects: Extravasation of intravenous drugs, Oral Tumour lysis syndrome, mucositis, Hyperuricaemia, Bone-marrow suppression, Thromboembolism, Nausea and vomiting, Upper respiratory infection, Alopecia Urinary tract infection, Amenorrhea, Diarrhea, Stomatitis, Constipation, Headache, Back pain, Frequency Not Defined, Decreased left ventricular ejection fraction, Cardiotoxicity, Myelosuppression, Hepatotoxicity, Abnormal LFT's

Dose: injectable solution 2mg/Ml For adult: Secondary Progressive Multiple Sclerosis 12 mg/m² short IV (5-15 minutes) infusion q3Months Not to exceed lifetime cumulative dose of 140 mg/m² Acute Nonlymphocytic Leukemia Induction

- 12 mg/m²/day IV on days 1-3 with cytarabine 100 mg/m²/day IV continuous infusion on days 1-7
- Second induction with same doses of mitoxantrone for 2 days & cytarabine for 5 days may be given if incomplete antileukemic response & no severe non hematologic toxicity in first induction
- Consolidation***:*** 12mg/m²/day for 2 days, repeat in 4 weeks For pediatric: <12 years old***:*** Safety and efficacy not established For Geriatric: Secondary progressive multiple sclerosis 12 mg/m² short IV (5-15 minutes) infusion q3Months Acute nonlymphocytic leukemia

Induction:
●12 mg/m²/day IV on days 1-3 with cytarabine 100 mg/m²/day IV continuous infusion on days 1-7
●Second induction with same doses of mitoxantrone for 2 days & cytarabine for 5 days may be given if incomplete antileukemic response & no severe non hematologic toxicity in first induction
Consolidation*:* 12 mg/m²/day for 2 days, repeat in 4 weeks Prostate cancer 12-14 mg/m² q21Days every 3 weeks in combination with corticosteroids

- *Onkotrone. Concentrate for intravenous infusion 2 mg/ml-*

OTHER ANTINEOPLASTIC DRUGS

PROTEASOME INHIBITOR

BORTEZOMIB

Indications: Mantle cell lymphoma*:* Treatment of mantle cell lymphoma in patients who have received at least 1 prior therapy Multiple myeloma*:* Treatment of multiple myeloma
Cautions: cardiovascular disease; pulmonary disease (chest x-ray recommended before treatment—discontinue if interstitial lung disease develops); consider antiviral prophylaxis for herpes zoster infection; risk factors for seizures; amyloidosis; history of syncope and concurrent use of medication which may cause hypotension; dehydration; risk of neuropathy—; monitor blood-glucose concentration in patients on oral antidiabetics; monitor for symptoms of progressive multifocal leucoencephalopathy (presenting as new or worsening neurological signs or symptoms)—discontinue treatment if diagnosed
Note*:* High alert medication:
This medication is in a class the Institute for Safe Medication Practices (ISMP) includes among its list of drug classes which have a heightened risk of causing significant patient harm when used in error.
Contra-indications: Hypersensitivity (excluding local reactions) to bortezomib, boron, mannitol, or any component of the formulation; administration via the intrathecal route.

Renal impairment: No dosage adjustment necessary. Dialysis may reduce bortezomib concentrations; administer post dialysis.
Hepatic impairment: Mild impairment (bilirubin ≤1 times ULN and AST >ULN or bilirubin >1-1.5 times ULN)***:*** No initial dose adjustment is necessary. Moderate (bilirubin >1.5-3 times ULN) and severe impairment (bilirubin >3 times ULN)***:*** Reduce initial dose to 0.7 mg/m^2 in the first cycle; based on patient tolerance, may consider dose escalation to 1 mg/m^2 (LoRusso, 2012) or further dose reduction to 0.5 mg/m^2 in subsequent cycles Obesity***:*** ASCO Guidelines for appropriate chemotherapy dosing in obese adults with cancer***:*** Utilize patient's actual body weight (full weight) for calculation of body surface area- or weight-based dosing, particularly when the intent of therapy is curative; manage regimen-related toxicities in the same manner as for nonobese patients; if a dose reduction is utilized due to toxicity, consider resumption of full weight-based dosing with subsequent cycles, especially if cause of toxicity (eg, hepatic or renal impairment) is resolved.
Side Effects: MOST COMMON***:*** Central nervous system***:*** Fatigue, peripheral neuropathy neuralgia, headache, paresthesia, dizziness (excludes vertigo) Dermatologic***:*** Skin rash. Gastrointestinal***:*** Diarrhea, nausea, constipation, vomiting, anorexia, abdominal pain, decreased appetite. Hematologic & oncologic***:*** Thrombocytopenia, neutropenia anemia, leukopenia. Neuromuscular & skeletal***:*** Weakness Respiratory***:*** Dyspnea. Miscellaneous***:*** Fever. LESS COMMON***:*** Cardiovascular***:*** Cardiac disease, hypotension, cardiac failure (includes acute pulmonary edema, cardiac failure, congestive cardiac failure, cardiogenic shock) Endocrine & metabolic***:*** Dehydration. Hematologic & oncologic***:*** Hemorrhage. Infection***:*** Herpes zoster. Local***:*** Irritation at injection site. Respiratory***:*** Pneumonia. Miscellaneous***:*** Herpes zoster. RARE (Limited to important or life-threatening)***:*** Acute ischemic stroke, adult respiratory distress syndrome, aggravated atrial fibrillation, amyloid heart disease, amyloidosis, anaphylaxis, angina pectoris, angioedema, arthralgia, ascites, aspergillosis, ataxia, atelectasis, atrial flutter, atrioventricular block, auditory impairment, back pain, bacteremia, blindness, blurred

vision, bone fracture, bradycardia, brain disease, bronchitis, cardiac arrest, cardiac tamponade, cardiorespiratory arrest, catheter infection, cerebral hemorrhage, cerebrovascular accident, chills, cholestasis, coma, confusion, conjunctival infection, conjunctival irritation, cranial nerve palsy, decreased left ventricular ejection fraction, deep vein thrombosis, diplopia, disseminated intravascular coagulation, duodenitis (hemorrhagic), dysarthria, dysautonomia, dysgeusia, dyspepsia, dysphagia, edema, embolism, epistaxis, febrile neutropenia, fecal impaction, gastritis (hemorrhagic), gastroenteritis, gastroesophageal reflux disease, glomerulonephritis, hematemesis, hematuria, hemoptysis, hemorrhagic cystitis, hemorrhagic stroke, hepatic failure, hepatic hemorrhage, hepatic injury, hepatitis, herpes meningoencephalitis, hyperbilirubinemia, hyperglycemia, hyperkalemia, hypernatremia, hypersensitivity, hypersensitivity angiitis, hyperuricemia, hypocalcemia, hypoglycemia, hypokalemia, hyponatremia, hypoxia, increased gamma-glutamyl transferase, increased serum alkaline phosphatase, increased serum transaminases, interstitial pneumonitis, intestinal obstruction, intestinal perforation, ischemic colitis, ischemic heart disease, laryngeal edema, limb pain, listeriosis, lymphocytopenia, malaise, melena, mental status changes, myalgia, myocardial infarction, nasopharyngitis, nephrolithiasis, ocular herpes simplex, optic neuritis, oral candidiasis, oral mucosal petechiae, ostealgia, pancreatitis, paralytic ileus, pericardial effusion, pericarditis, peritonitis, phlebitis, pleural effusion, pneumonitis, portal vein thrombosis, proliferative glomerulonephritis, prolonged Q-T interval on ECG, pruritus, psychosis, pulmonary embolism, pulmonary hypertension, pulmonary infiltrates (including diffuse), renal failure, respiratory failure, respiratory insufficiency, respiratory tract infection, reversible posterior leukoencephalopathy syndrome, seizure, sepsis, septic shock, SIADH, sinoatrial arrest, sinusitis, spinal cord compression, Stevens-Johnson syndrome, stomatitis, subarachnoid hemorrhage, subdural hematoma, suicidal ideation, Sweet's syndrome, syncope, tachycardia, torsades de pointes, toxic epidermal necrolysis, toxoplasmosis, transient ischemic attacks, tumor lysis syndrome, urinary incontinence, urinary

retention, urinary tract infection, urticaria, ventricular tachycardia, vertigo, weight loss.

Dose: Note*:* Consecutive doses should be separated by at least 72 hours. Multiple myeloma (first-line therapy; in combination with melphalan and prednisone)*:* IV, SubQ*:* 1.3 mg/m^2 days 1, 4, 8, 11, 22, 25, 29, and 32 of a 42-day treatment cycle for 4 cycles, followed by 1.3 mg/m^2 days 1, 8, 22, and 29 of a 42-day treatment cycle for 5 cycles. Retreatment may be considered for multiple myeloma patients who had previously responded to bortezomib (either as monotherapy or in combination) and who have relapsed at least 6 months after completing prior bortezomib therapy; initiate at the last tolerated dose.

Alternative first-line therapy (unlabeled dosing):

CyBorD regimen*:* IV*:* 1.5 mg/m^2 days 1, 8, 15, and 22 of a 28-day treatment cycle for 4 cycles (may continue beyond 4 cycles) in combination with cyclophosphamide and dexamethasone.

PAD regimen (IV Induction)*:* 1.3 mg/m^2 days 1, 4, 8, and 11 of a 28-day treatment cycle for 3 cycles (in combination with doxorubicin and dexamethasone), followed by conditioning/stem cell transplantation, and then maintenance bortezomib 1.3 mg/m^2 once every 2 weeks for 2 years.

VRd regimen (IV)*:* 1.3 mg/m^2 days 1, 4, 8, and 11 of a 21-day treatment cycle for 8 cycles (in combination with lenalidomide and dexamethasone).

Patients ≥65 years (IV)*:* 1.3 mg/m^2 days 1, 8, 15, and 22 of a 35-day treatment cycle, in combination with either melphalan and prednisone or melphalan, prednisone, and thalidomide.

Multiple myeloma (relapsed)*:* IV, SubQ*:* 1.3 mg/m^2 twice weekly for 2 weeks on days 1, 4, 8, and 11 of a 21-day treatment cycle. Therapy extending beyond 8 cycles may be administered by the standard schedule or may be given once weekly for 4 weeks (days 1, 8, 15, and 22), followed by a 13-day rest (days 23 through 35). Retreatment may be considered for multiple myeloma patients who had previously responded to bortezomib (either as monotherapy or in combination) and who have relapsed at least 6 months after completing prior bortezomib therapy; initiate at the last tolerated dose. Administer twice weekly for 2 weeks on days 1, 4, 8, and

11 of a 21-day treatment cycle (either as a single-agent or in combination with dexamethasone) for a max. of 8 cycles.
Alternative relapsed therapy (unlabeled dosing)*:* IV*:* 1.3 mg/m^2 days 1, 4, 8, and 11 of a 21-day treatment cycle for at least 8 cycles or until disease progression or unacceptable toxicity (in combination with liposomal doxorubicin).
Mantle cell lymphoma*:* IV, SubQ*:* 1.3 mg/m^2 twice weekly for 2 weeks on days 1, 4, 8, and 11 of a 21-day treatment cycle. Therapy extending beyond 8 cycles may be administered by the standard schedule or may be given once weekly for 4 weeks (days 1, 8, 15, and 22), followed by a 13-day rest (days 23 through 35).
Cutaneous or peripheral T-cell lymphoma, relapsed/refractory (unlabeled use)*:* IV*:* 1.3 mg/m^2 twice weekly for 2 weeks on days 1, 4, 8, and 11 of a 21-day treatment cycle (Zinzani, 2007); additional data may be necessary to further define the role of bortezomib in this condition.
Follicular lymphoma, relapsed/refractory (unlabeled use)*:* IV*:* 1.3 mg/m^2 days 1, 4, 8, and 11 of a 28-day treatment cycle, in combination with bendamustine and rituximab for 6 cycles (Friedberg, 2011) or 1.6 mg/m^2 days 1, 8, 15, and 22 of a 35-day treatment cycle, in combination with bendamustine and rituximab for 5 cycles (Fowler, 2011)
Systemic light-chain amyloidosis (unlabeled use)*:* IV*:* 1.3 mg/m^2 days 1, 4, 8, and 11 of a 21-day treatment cycle (with or without dexamethasone) (Kastritis, 2010

- *Velcade Injection, powder for reconstitution 3.5-mg vial*

CRISANTASPASE *(*Asparaginase)

Asparaginase contains the enzyme L-asparagine amidohydrolase which hydrolyses serum asparagine to nonfunctional aspartic acid and ammonia, depriving tumour cells of a required amino acid.
Indications: Acute lymphoblastic leukaemias (induction regimen in paediatric).
Cautions: Intradermal skin test should be performed prior to initial administration of this drug and repeated when at least 1 week separates doses (to avoid risk of anaphylaxis); monitor frequently serum amylase to detect

early evidence of pancreatitis. If pancreatitis occurs, discontinue therapy.
Contra-indications: Anaphylactic reactions to asparaginase; pancreatitis or a history of pancreatitis; pregnancy & breast feeding
Side Effects: anaphylaxis, nausea, vomiting, pancreatitis, CNS depression, and liver and blood lipid changes. Careful monitoring is, therefore, necessary and the urine should be tested for glucose because of a risk of hyperglycaemia.

- *Crisantaspase 10, 000 Unit For Injection.*

DACARBAZINE

Indications: metastatic melanoma and, in combination therapy, soft tissue sarcomas. It is also a component of a commonly used second line combination for Hodgkin's disease [ABVD-doxorubicin (Adriamycin), bleomycin, vinblastine and dacarbazine].
Cautions: caution in handling - irritant to skin and mucous membranes.
Contra-indications: pregnancy
Side effect: myelosuppression; very severe nausea and vomiting; rarely liver necrosis due to hepatic vein thrombosis; irritant to skin and tissues.

- *Dacarbazine 200mg Vial For Injection*

PROTEIN KINASE INHIBITORS

ERLOTINIB

Indications: a tyrosine kinase inhibitor, is used in combination with gemcitabine for the treatment of metastatic pancreatic cancer. It is also for the treatment of locally advanced or metastatic non-small cell lung cancer after failure of previous chemotherapy and as monotherapy for maintenance treatment of locally advanced or metastatic non-small cell lung cancer with stable disease after four cycles of platinum-based chemotherapy.
Cautions: pre-existing liver disease or concomitant use with hepatotoxic drugs—monitor liver function; dose adjustment may be necessary if smoking started or stopped during treatment; Epidermal Growth Factor

Receptor (EGFR) Inhibitors*:* Serious Cases of Keratitis and Ulcerative Keratitis;
Hepatic impairment: manufacturer advises caution in mild to moderate impairment; avoid in severe impairment
Renal impairment: manufacturer advises avoid in severe impairment
Pregnancy: manufacturer advises avoid—toxicity in animal studies; effective contraception required during and for at least 2 weeks after treatment;
Breast-feeding: manufacturer advises avoid—no information available
Side Effects: common to most cytotoxic drugs also diarrhoea, abdominal pain, dyspepsia, flatulence; anorexia, depression, neuropathy, headache; fatigue, rigor; conjunctivitis; pruritus, dry skin; less commonly gastro-intestinal perforation, interstitial lung disease—discontinue if unexplained symptoms such as dyspnea, cough or fever occur; eyelash changes; rarely hepatic failure; very rarely corneal perforation or ulceration, Stevens-Johnson syndrome, and toxic epidermal necrolysis
Dose: Non-small cell lung cancer, 150 mg once daily Pancreatic cancer, 100 mg once daily in combination with gemcitabine

- *Tarceva Tablets 100 mg, 150mg*

LAPATINIB

Indications*:* Breast cancer:
Treatment of human epidermal growth receptor type 2 (HER2) overexpressing advanced or metastatic breast cancer (in combination with capecitabine) in patients who have received prior therapy (with an anthracycline, a taxane, and trastuzumab)
HER2 overexpressing hormone receptor–positive metastatic breast cancer in postmenopausal women where hormone therapy is indicated (in combination with letrozole)
Limitations of use**:** Patients should have disease progression on trastuzumab prior to initiation of treatment with lapatinib in combination with capecitabine.
Cautions: low gastric pH (reduced absorption); susceptibility to QT-interval prolongation (including concomitant use of drugs that prolong QT-interval and

electrolyte disturbances); monitor left ventricular function; monitor for pulmonary toxicity; monitor liver function before treatment and at monthly intervals.
Note**:** This medication is in a class the Institute for Safe Medication Practices (ISMP) includes among its list of drug classes which have a heightened risk of causing significant patient harm when used in error.
Contra-indications: Hypersensitivity to lapatinib or any component of the formulation.
Hepatic impairment: caution in moderate to severe impairment (metabolism reduced).
Renal impairment: caution in severe impairment (no information available)
Pregnancy: avoid unless potential benefit outweighs risk (toxicity in *animal* studies).
Side Effects: anorexia, diarrhoea (treat promptly), decreased left ventricular ejection fraction, cardiac failure (fatal cases reported), malaise, rash, nail disorders, hyperbilirubinaemia, hepatotoxicity (discontinue permanently if severe). less commonly**:** interstitial lung disease; respiratory failure (including fatal cases) also reported
Dose**:** In combination with capecitabine;
ADULT over 18 years; 1.25 g once daily
In combination with an aromatase inhibitor.
ADULT over 18 years:, 1.5 g once daily
Always take at the same time in relation to food**:** either one hour before or one hour after food. Patients should report unexpected changes in bowel habit.

- *Tyverb Tablets, 250 mg*

EVEROLIMUS

Indications: Breast cancer, advanced**:**
Treatment of advanced hormone receptor-positive, HER2-negative breast cancer in postmenopausal women (in combination with exemestane and after letrozole or anastrozole failure)
Pancreatic neuroendocrine tumors**:**
Treatment of advanced, metastatic or unresectable pancreatic neuroendocrine tumors (PNET)
Limitations of use**:** Not indicated for the treatment of functional carcinoid tumors.

Renal angiomyolipoma with tuberous sclerosis complex
Treatment of renal angiomyolipoma with tuberous sclerosis complex (TSC) not requiring immediate surgery
Renal cell carcinoma, advanced (Afinitor only)**:**
Treatment of advanced renal cell cancer (RCC) after sunitinib or sorafenib failure
Subependymal giant cell astrocytoma Treatment of subependymal giant cell astrocytoma (SEGA) associated with TSC which requires intervention, but cannot be curatively resected.
Liver transplantation (Zortress only)**:**
Prophylaxis of organ rejection in liver transplantation (in combination with corticosteroids and reduced doses of tacrolimus).
Renal transplantation (Zortress only):
Prophylaxis of organ rejection in renal transplant patients at low to moderate immunologic risk (in combination with basiliximab induction and concurrent with corticosteroids and reduced doses of cyclosporine).
Cautions: monitor blood-glucose concentration, serum-triglycerides and serum-cholesterol before treatment and periodically thereafter.
concomitant use of drugs that increase risk of bleeding.
history of bleeding disorders.
monitor renal function before treatment and periodically thereafter.
reduce dose or discontinue if severe Side effects occur.
Contra-indications: Hypersensitivity to everolimus, sirolimus, other rapamycin derivatives, or any component of the formulation.
Renal Impairment: No dosage adjustment is necessary.
Hepatic Impairment: Mild impairment (Child-Pugh class A): Breast cancer, PNET, RCC, renal angiomyolipoma**:**
Reduce dose to 7.5 mg once daily
if not tolerated, may further reduce to 5 mg once daily.
Liver or renal transplantation**:**
Reduce initial dose by ~33% (individualize subsequent dosing based on therapeutic drug monitoring (target trough concentration**:** 3 to 8 ng/ml).
SEGA: U.S. labeling**:** Adjustment to initial dose may not be necessary subsequent dosing is based on therapeutic drug monitoring (monitor ~2 weeks after initiation, dosage

modifications, or after any change in hepatic status; target trough concentration: 5 to 15 ng/ml).
Canadian labeling:
Initial: Patients ≥18 years of age:
75% of usual dose based on calculated BSA (rounded to the nearest strength). Assess trough concentrations ~2 weeks after initiation, dosage modifications, or after any change in hepatic status.
Target trough concentration:
5 to 15 ng/ml (may increase dose within the target range to achieve higher concentrations as tolerated).
Patients <18 years of age: Use is not recommended.
Moderate impairment (Child-Pugh class B):
Breast cancer, PNET, RCC, renal angiomyolipoma:
Reduce dose to 5 mg once daily
if not tolerated, may further reduce to 2.5 mg once daily.
Liver or renal transplantation:
Reduce initial dose by ~50% (individualize subsequent dosing based on therapeutic drug monitoring) (target trough concentration: 3 to 8 ng/ml).
SEGA: U.S. labeling:
Adjustment to initial dose may not be necessary subsequent dosing is based on therapeutic drug monitoring (monitor ~2 weeks after initiation, dosage modifications, or after any change in hepatic status) (target trough concentration: 5 to 15 ng/ml).
Canadian labeling:
Initial: Patients ≥18 years of age: 50% of usual dose based on calculated BSA (rounded to the nearest strength). Assess trough concentrations ~2 weeks after initiation, dosage modifications, or after any change in hepatic status. Target trough concentration: 5 to 15 ng/ml (may increase dose within the target range to achieve higher concentrations as tolerated).
Patients <18 years of age: Use is not recommended.
Severe impairment (Child-Pugh class C):
Breast cancer, PNET, RCC, renal angiomyolipoma:
If potential benefit outweighs risks, a max. dose of 2.5 mg once daily may be used. Liver or renal transplantation:
Reduce initial dose by ~50% (individualize subsequent dosing based on therapeutic drug monitoring) (target trough concentration: 3 to 8 ng/ml).

SEGA: U.S. labeling**:** Reduce initial dose to 2.5 mg/m^2 once daily (or current dose by ~50%)
subsequent dosing is based on therapeutic drug monitoring (monitor ~2 weeks after initiation, dosage modifications, or after any change in hepatic status; target trough concentration**:** 5 to 15 ng/ml).
Pregnancy**:** manufacturer advises avoid (toxicity in animal studies)
effective contraception must be used during and for up to 8 weeks after treatment.
Breast-feeding**:** manufacturer advises avoid
Side Effects: Most common **:** diarrhoea, dry mouth, abdominal pain, dysphagia, anorexia, taste disturbance, chest pain, hypertension, hyperlipidaemia, hypercholesterolaemia, peripheral oedema, pneumonitis (including interstitial lung disease), asthenia, fatigue, headache, insomnia, convulsions, irritability, increased susceptibility to infections (including pneumonia, aspergillosis, and candidiasis), hyperglycaemia, hypoglycaemia, dehydration, renal failure, electrolyte disturbance, arthralgia, eyelid oedema, epistaxis, skin and nail disorders (including hand-foot syndrome).
less commonly:
congestive heart failure, flushing, agitation, aggression, rhabdomyolysis and impaired wound healing
hepatitis B reactivation and haemorrhage also reported
Dose**:** renal cell carcinoma, neuroendocrine tumours of pancreatic origin, hormone-receptor-positive breast cancer: ADULT over 18 years: 10 mg once daily.

- *Affinitor tablets 0.25mg, 0.5mg, 1mg 10mg.*

NILOTINIB

Indications: Chronic myeloid leukemia (CML)***:***
Treatment of newly-diagnosed Philadelphia chromosome-positive CML (Ph+ CML) in chronic phase treatment of chronic and accelerated phase Ph+ CML refractory or intolerant to prior therapy.
Cautions: history of pancreatitis susceptibility to QT-interval prolongation (including electrolyte disturbances concomitant use of drugs that prolong QT interval).
Contra-indications: Use in patients with hypokalemia, hypomagnesemia, or long QT syndrome

Canadian labeling*:* Additional contraindication (not in U.S. labeling)*:* Hypersensitivity to nilotinib or any component of the formulation (persistent QTc >480 msec).
Hepatic impairment: manufacturer advises caution
Renal impairment: nilotinib and its metabolites have minimal renal excretion (dosage adjustments for renal dysfunction may not be necessary).
Pregnancy: manufacturer advises avoid unless potential benefit outweighs risk (toxicity in animal studies) effective contraception required during treatment
Side Effects: Most common*:* abdominal pain, constipation, diarrhoea, dyspepsia, flatulence, anorexia, weight changes; palpitation, QT-interval prolongation, hypertension, oedema, flushing; dyspnea, cough, dysphonia; headache, fatigue, asthenia, dizziness, paraesthesia, insomnia, vertigo; hypomagnesaemia, hyperkalaemia, blood glucose changes; bone pain, arthralgia, muscle spasm; urticaria, erythema, hyperhidrosis, dry skin, rash, pruritus. less commonly*:* hepatitis, pancreatitis, dry mouth, chest pain, cardiac failure, arrhythmias, pericardial effusion, coronary artery disease, cardiomegaly, cardiac murmur, bradycardia, hypertensive crisis, haemorrhage, melaena, haematoma, pleural effusion, interstitial lung disease, migraine, hypoaesthesia, hyperaesthesia, depression, anxiety, tremor, influenza-like symptoms, hyperthyroidism, breast pain, gynaecomastia, erectile dysfunction, dysuria, urinary frequency, hypokalaemia, hyponatraemia, hypocalcaemia, hypophosphataemia, dehydration, decreased visual acuity, conjunctivitis, dry eyes, epistaxis, and ecchymosis.
Dose: Newly diagnosed chronic myeloid leukaemia, chronic phase*:* ADULT over 18 years*:* 300 mg twice daily Chronic and accelerated phase chronic myeloid leukaemia*:* ADULT over 18 years*:* 400 mg twice daily

- *Tasigna Capsules 200 mg.*

PAZOPANIB

Vascular Endothelial Growth Factor (VEGF) Inhibitor
Indications: Renal cell carcinoma*:* Treatment of advanced renal cell carcinoma Soft tissue sarcoma*:* Treatment of advanced soft tissue sarcoma (in patients

who have received prior chemotherapy) Limitations of use*:* The efficacy of pazopanib for the treatment of adipocytic soft tissue sarcoma or gastrointestinal stromal tumors has not been demonstrated.
Cautions: monitor liver function before treatment and at weeks 3, 5, 7, and 9, then at months 3 and 4, and periodically thereafter as clinically indicated if elevated liver enzymes observed control blood pressure before initiating and monitor blood pressure within 1 week of treatment initiation, then frequently throughout treatment (consider dose reduction or interruption if hypertension uncontrolled despite anti-hypertensive therapy. discontinue if blood pressure persistently elevated despite anti-hypertensive therapy and pazopanib dose reduction—)
susceptibility to QT-interval prolongation (including electrolyte disturbances, concomitant use of drugs that prolong QT-interval). patients at risk of thrombotic events including myocardial infarction, ischaemic stroke or transient ischaemic attack. cardiac disease (monitor for signs or symptoms of congestive heart failure—monitor left ventricular ejection fraction in patients at risk of heart failure before and during treatment) patients at increased risk of haemorrhage patients at increased risk of gastro-intestinal perforation or fistulas. discontinue treatment 7 days before elective surgery and restart only if adequate wound healing; monitor thyroid function. monitor for proteinuria increased risk of thrombotic microangiopathy—permanently discontinue if symptoms develop. monitor for signs and symptoms of posterior reversible encephalopathy syndrome (including headache, hypertension, seizure, lethargy, confusion, visual and neurological disturbances)—permanently discontinue treatment if symptoms occur.
Contra-indications: cerebral or clinically significant gastro-intestinal haemorrhage or haemoptysis in the past 6 months.
Hepatic impairment: use with caution in mild to moderate impairment (reduce dose to 200 mg once daily in moderate impairment).avoid in severe impairment.
Renal impairment: use with caution if creatinine clearance less than 30 ml/minute (no information available).

Pregnancy: avoid unless potential benefit outweighs risk (toxicity in animal studies) effective contraception advised during treatment.
Side Effects: Most commonly**:** abdominal pain, abdominal distension, dyspepsia, diarrhoea, weight loss, anorexia, dry mouth, taste disturbance, flatulence, hepatic dysfunction, hyperbilirubinaemia, hypertension, flushing, chest pain, oedema, venous thromboembolic events, dyspnea, cough, pneumothorax, hiccups, epistaxis, voice changes, headache, dizziness, malaise, paraesthesia, insomnia, hypothyroidism, proteinuria (discontinue if grade 4), blood disorders (including thrombocytopenia), hyperalbuminaemia, increased amylase, dehydration, muscle spasm, myalgia, blurred vision, sweating, skin reactions, dry skin, hair and skin discoloration, nail disorders. less commonly**:** hepatic failure, gastro-intestinal perforation, peritonitis, pancreatitis, fistula, cardiac dysfunction, transient ischaemic attack, stroke, myocardial infarction, myocardial ischaemia, bradycardia, haemorrhage, hypertensive crisis, QT-interval prolongation, pulmonary embolism, peripheral neuropathy, menstrual disturbances, hypomagnesaemia, arthralgia, oropharyngeal pain, photosensitivity reactions. rarely thrombotic microangiopathy.
Dose: adult over 18 years**:** 800 mg once daily adjust dose in steps of 200 mg according to tolerability (max. 800 mg daily).

- *Votrient Tablets 200 mg*

ANTINEOPLASTIC AGENT, BIOLOGICAL RESPONSE MODULATOR; VACCINE, LIVE (BACTERIAL).

TRABECTEDIN

Indications: Canadian labeling***:*** Ovarian cancer***:*** Treatment of relapsed platinum-sensitive ovarian cancer (in combination with doxorubicin liposomal)
Soft tissue sarcoma***:*** Treatment of metastatic soft tissue sarcoma (liposarcoma or leiomyosarcoma) after failure of prior anthracycline and ifosfamide chemotherapy.
Cautions: measure creatine kinase, renal function and hepatic function before starting, monitor haematological and hepatic parameters weekly during first 2 cycles and at

least once between treatments in subsequent cycles; concomitant use with hepatotoxic drugs (avoid alcohol). Note*:* High alert medication*:* This medication is in a class the Institute for Safe Medication Practices (ISMP) includes among its list of drug classes which have a heightened risk of causing significant patient harm when used in error.
Contra-indications: Hypersensitivity to trabectedin or any component of the formulation. concurrent active serious or uncontrolled infection breast-feeding
Hepatic impairment: manufacturer advises caution in impairment—consider dose reduction; avoid in patients with raised bilirubin
Renal impairment: avoid monotherapy if creatinine clearance less than 30 ml/minute; avoid combination regimens if creatinine clearance less than 60 ml/minute.
Pregnancy: effective contraception recommended during and for at least 3 months after treatment in women and during and for at least 5 months after treatment in men.
Breast-feeding: manufacturer advises avoid breast-feeding*:* during and for 3 months after treatment.
Side Effects: MOST COMMON*:* Central nervous system*:* Fatigue, fever, headache, paresthesia Dermatologic*:* Palmar-Plantar erythrodysesthesia, alopecia, skin rash Endocrine & metabolic*:* Hypokalemia, hypophosphatemia Gastrointestinal*:* Nausea, vomiting, anorexia, constipation, diarrhea, abdominal pain, stomatitis, weight gain, dyspepsia, mucosal inflammation. Hematologic*:* Anemia, leukopenia, neutropenia, thrombocytopenia, decreased neutrophils. Hepatic*:* Increased ALT, increased AST, increased alkaline phosphatase, hyperbilirubinemia. Local*:* Phlebitis, injection/catheter site reactions Neuromuscular & skeletal*:* Increased CPK, weakness, arthralgia. Renal*:* Increased serum creatinine Respiratory*:* Dyspnea, cough. LESS COMMON*:* Cardiovascular*:* Peripheral edema, palpitation, edema, syncope, chest pain, left ventricular dysfunction. Central nervous system*:* Insomnia, dizziness. Dermatologic*:* Hyperpigmentation. Endocrine & metabolic*:* Dehydration. Gastrointestinal*:* Decreased appetite, dysgeusia Hematologic*:* Bleeding complications, febrile

neutropenia, decreased white blood cell count, decreased hemoglobin, decreased platelet count, bone marrow failure, granulocytopenia, pancytopenia, neutropenic infection. Hepatic*:* Increased serum transaminases, hepatotoxicity. Hypersensitivity*:* Hypersensitivity. Local*:* Catheter site pain, catheter site erythema, catheter site inflammation. Neuromuscular & skeletal*:* Myalgia, peripheral neuropathy, musculoskeletal pain. Renal*:* Renal failure. Respiratory*:* Pulmonary embolism, pulmonary edema. Miscellaneous*:* Neutropenic sepsis. RARE (Limited to important or life-threatening)*:* Extravasation (with tissue necrosis, requiring debridement), prolonged QT interval on ECG, rhabdomyolysis.

Dose:

Note*:* Prior to each treatment cycle, ANC should be ≥1500/mm^3, platelets ≥100, 000/mm^3, hemoglobin ≥9 g/dL, bilirubin ≤ULN; alkaline phosphatase (nonosseous origin), ALT and AST ≤2.5 times ULN; albumin ≥25 g/L; creatinine clearance ≥30 ml/minute (single-agent therapy), serum creatinine ≤1.5 mg/dL or creatinine clearance ≥60 ml/minute (combination therapy with doxorubicin liposomal); and CPK ≤2.5 times ULN. Premedicate with dexamethasone IV 20 mg 30 minutes prior to infusion (for hepatoprotective and antiemetic effects); additional antiemetics may be administered.

- *Yondelis Injection, powder for reconstitution, 1 mg I.V.*

VINCA ALKALOIDS

VINBLASTINE SULFATE

This is an antineoplastic agent which apparently acts by binding to the microtubular proteins of the spindle and arresting mitosis at the metaphase.

Indications: Acute leukaemias; lymphomas and certain solid tumours (breast and lung cancer)

Cautions: avoid contact with eyes; caution in handling - irritant to tissues; hepatic impairment.

Contra-indications: pregnancy & breast feeding. Intra-thecal injection may cause neurotoxicity.

Side effect: Myeolosuppression is the dose-limiting side-effect of vinblastine and vinorelbine (vincristine causes

negligible myelosuppression); neurotoxicity, usually as peripheral or autonomic neuropathy, is a limiting side effect of vincristine (less often with vinblastine and vinorelbine); reversible alopecia.

- *Velbe 10mg Amp For Injection*

VINCRISTINE SULFATE

This is an antineoplastic agent which may act similarly to vinblastine.
Indications: acute leukaemias, particularly lymphoblastic leukaemia, lymphomas and certain solid tumours.
Cautions: see vinblastine
Contra-indications: see vinblastine
Side effect: See vinblastine.
Dose: Max. recommended dose, 2mg.

- *Oncovin 1mg Vial For Injection.*

ETOPOSIDE

This is a semi-synthetic derivative of podophyllotoxin with antimitotic and antineoplastic properties.
Indications: small cell carcinoma of the bronchus; lymphomas, and testicular cancer.
Cautions: renal impairment.
Contra-indications: Severe hepatic impairment; ***pregnancy*** & breast feeding.
Side effect: alopecia, myelosuppression (dose-related), nausea and vomiting.
Dose: Oral***:*** 120 – 140mg/m^2 daily for 5 days.

- *Vepesid 20mg/ml For Injection.*
- *Vepesid Capsules 50mg Po.*

HYDROXYCARBAMIDE:

HYDROXYUREA

This is an antineoplastic that may cause inhibition of DNA synthesis by acting as a ribonucleotide reductase inhibitor.
Indications: chronic myeloid leukaemia; myeloproliferative disorders; polycythemia vera; haemoglobinopathies (sickle-cells disease).

Cautions: impaired renal function; pre-existing anaemia should be corrected before beginning therapy with hydroxyurea.
Contra-indications: ***pregnancy*** & breast feeding.
Side effect: myelosuppression, nausea, and skin reactions.
Dose: 20-30mg/kg daily or 80mg/kg every third day.

- *Hydrea 500mg Capsule*

MONOCLONAL ANTIBODY:

NATALIZUMAB

A Selective Adhesion-Molecule Inhibitor.
Indications**:** Crohn disease**:** For inducing and maintaining clinical response and remission in adult patients with moderately to severely active Crohn disease with evidence of inflammation who have had an inadequate response to, or are unable to tolerate, conventional Crohn disease therapies and inhibitors of tumor necrosis factor-alpha (TNF-alpha).
Multiple sclerosis**:** As monotherapy for the treatment of patients with relapsing forms of multiple sclerosis (MS). Natalizumab increases the risk of PML. When initiating and continuing treatment with natalizumab, consider whether the expected benefit of natalizumab is sufficient to offset this risk.
Canada labeling**:** Treatment of relapsing forms of multiple
Cautions: Natalizumab is associated with an increased risk of opportunistic infection and progressive multifocal leucoencephalopathy (PML) caused by JC virus
Contra-indications: Hypersensitivity to natalizumab or any component of the formulation.
current or history of progressive multifocal leukoencephalopathy (PML)
Canada labeling**:** Additional contraindications (not in U.S. labeling)**:** Immunocompromised patients as a result of immunosuppressant or antineoplastic therapy, or immunodeficiencies (eg, HIV, leukemia, lymphoma.
Pregnancy: avoid unless essential (toxicity in animal studies).
Breast-feeding: Avoid (present in milk in animal studies

Renal impairment: No dosage adjustment provided in manufacturer's labeling (has not been studied).
Hepatic impairment: No dosage adjustment provided in manufacturer's labeling (has not been studied). Discontinue use with jaundice or signs/symptoms of hepatic injury
Side Effects: Most common**:** Central nervous system**:** Headache, fatigue, depression. Dermatologic**:** Rash. Gastrointestinal**:** Nausea, gastroenteritis, abdominal discomfort Genitourinary**:** Urinary tract infection. Neuromuscular & skeletal**:** Arthralgia, extremity pain, back pain Respiratory**:** Upper respiratory infection, lower respiratory infection. Miscellaneous**:** Infusion-related reaction, influenza, flu-like syndrome. Less common**:** Cardiovascular**:** Peripheral edema, chest discomfort. Central nervous system**:** Vertigo, dysesthesia, syncope somnolence. Dermatologic**:** Dermatitis, pruritus, urticarial, dry skin. Endocrine & metabolic**:** Dysmenorrhea, menstrual irregularities amenorrhea, ovarian cyst. Gastrointestinal**:** Diarrhea, dyspepsia, abdominal pain constipation, flatulence, aphthous stomatitis, weight changes cholelithiasis, gingival infection. Genitourinary**:** Vaginitis/vaginal infections, urinary frequency urinary incontinence. Hematologic**:** Hematoma. Hepatic**:** Transaminase increased. Local**:** Bleeding at injection site. Neuromuscular & skeletal**:** Muscle cramp, tremor rigors joint swelling. Respiratory**:** Sinusitis, cough, tonsillitis, pharyngolaryngeal pain epistaxis. Miscellaneous***:*** Antibody formation, tooth infection, herpes infection, viral infection, hypersensitivity reactions, toothache limb injury serious infection, laceration, thermal injury, night sweats. rare (Limited to important or life-threatening)***:*** Acne, agitation, anaphylaxis/anaphylactoid reactions, anemia, angina, appendicitis, bilirubin increased, bronchopulmonary aspergillosis, Burkholderia cepacia, Crohn's disease exacerbation, cryptosporidial gastroenteritis, cytomegalovirus hepatitis, dizziness, dyspnea, erythema. fever, flushing, hemoglobin decreased (mild, transient), hepatic failure, hepatotoxicity, herpes encephalitis, herpes meningitis, hypotension, IRIS, joint stiffness, lethargy, leukocytosis, nasopharyngitis, opportunistic infections (including progressive multifocal

leukoencephalopathy [PML], meningitis, and bronchopulmonary infections), muscle spasms, muscle weakness, onychorrhexis, paresis, pericarditis (case report), petechiae, pharyngitis, Pneumocystis jiroveci pneumonia, pneumonia, psychomotor hyperactivity, pulmonary Mycobacterium avium intracellulare, suicidal ideation, tachycardia, thrombocytopenia, thrombophlebitis, varicella pneumonia, vasodilatation
Dose: Multiple sclerosis***:*** IV***:*** 300 mg infused over 1 hour every 4 weeks Crohn disease***:*** IV***:*** 300 mg infused over 1 hour every 4 weeks; discontinue if therapeutic benefit is not observed within initial 12 weeks of therapy Concomitant use with corticosteroids***:*** For patients who begin treatment while on chronic oral corticosteroids, begin tapering oral steroids when the onset of natalizumab therapeutic benefit is observed; discontinue use if patient cannot be tapered off of oral corticosteroids within 6 months of therapy initiation. If additional concomitant corticosteroids are required and exceed 3 months/year (in addition to initial corticosteroid taper), consider discontinuing therapy

- *Tysabri concentrate for intravenous infusion, 20 mg/ml (300 mg) (*

TRASTUZUMAB

This is a monoclonal antibody directed against a cell surface protein produced by the human epidermal growth factor receptor 2 (HER_2) gene which is overexpressed in about one-third of all breast cancers.
Indications: As monotherapy for metastatic breast cancer or in combination with docetaxel or paclitaxel.
Cautions: Concomitant use of trastuzumab with anthracyclines is associated with cardiotoxicity. It has been advised that the use of anthracyclines even after stopping trastuzumab may carry a higher risk of cardiotoxicity and if possible should be avoided for up to 22 weeks. If anthracyclines need to be used, cardiac functions should be monitored.
Contra-indications: Severe dyspnea at rest; breast feeding
Side effect: Infusion-related side effects including chills, fever, hypersensitivity reactions such as anaphylaxis, urticaria and angioedema, pulmonary events (possibly

delayed onset); cardiotoxicity, gastrointestinal symptoms, asthenia, headache, chest pain, arthralgia, myalgia, hypotension.
Dose: 4mg/Kg initially, by intravenous infusion in 0.9% sodium chloride over 90 minutes. This may be followed by 2mg/Kg over 30 minutes at weekly intervals.

- *Herceptin 150mg Vial For Intravenous Infusion.*

PLATINUM COMPOUNDS

CARBOPLATIN

This is a platinum-containing complex which may act similarly to the alkylating agents.
Indications: Advanced ovarian cancer and lung cancer (particularly the small cell type)
Cautions: transfusional support may be needed particularly after prolonged therapy, since anaemia is cumulative; concurrent use of nephrotoxic compounds; renal impairment.
Contra-indications: severe renal impairment; severe myelosuppression; bleeding tumoural localizations; pregnancy & breast feeding.
Side Effects: Myelosuppression (more than cisplatin); nausea, vomiting, nephrotoxicity, neurotoxicity and ototoxicity (less than cisplatin); anaphylactic-like reactions may occur within a minute of administration.
Dose: needles or aluminium parts that may come in contact with the drug should not be used due to precipitate formation upon contact and loss of potency. Adults with normal kidney function and previously untreated***:*** 400mg/m^2 as single iv dose as short infusion (15– 60 minutes)

- *Paraplatin 10mg/ml; 45ml For IV Infusion (450mg)*

CISPLATIN

This is a platinum-containing complex with action similar to alkylating agents.
Indications: metastatic testicular or ovarian tumours; advanced bladder cancer.
Cautions: reduce dose in renal impairment.
Contra-indications: ***pregnancy*** & breast feeding.

Side Effects: severe nausea, vomiting, nephrotoxicity (pretreatment hydration recommended and the creatinine clearance should be closely monitored), myelo-toxicity, ototoxicity (high tone hearing loss and tinnitus), peripheral neuropathy, and hypomagnesaemia.

- *Cisplatin 10mg/20ml Vial For Injection.*
- *Cisplatin 50mg/50ml Vial For Injection.*

OXALIPLATIN

This is a platinum-containing complex similar to cisplatin.

Indications: metastatic colorectal cancer in combination with fluorouracil and folinic acid; colon cancer.

Cautions: Monitor WBC with differential, Hb, platelet count, and blood chemistries (ALT, AST, bilirubin and creatinine) before each cycle.

Contra-indications: patients with pre-existing sensory neuropathies or to those with severe renal impairment; pregnancy & breast feeding.

Side Effects: similar to those of cisplatin but nausea and vomiting, and nephrotoxicity, seem to be less marked. Peripheral neuropathy occurs in, of patients; pain, functional impairment and loss of tendon reflexes may develop.

- *Eloxatin 50m, 100mg Vial.*

TAXANES

DOCETAXEL

This is a semisynthetic taxane similar to paclitaxel; manufactured from a taxane precursors obtained from the needles of European yew tree Taxus baccata.

Indications: advance r metastatic breast cancer and non-small cell lung cancer resistant to other cytotoxic drugs; hormone-resistant prostate cancer.

Cautions: Premedication with oral dexamethasone for five days starting on the day before each course of docetaxel is recommended for reducing fluid retention and hypersensitivity reactions; hepatic impairment.

Contra-indications: pregnancy and breast-feeding; sever allergy; neutropenia; severe hepatic impairment; patients

hypersensitive to polysorbate-80, which is contained in the formulation.
Side effect: persistent fluid retention commonly seen as leg oedema which worsens during treatment and can be resistant to treatment; hypersensitivity reactions also occurs; ascites, pleural and pericardial effusion and weight gain is common and may be cumulative.

- *Taxotere 20mg, 80mg Vial For Injection*

PACLITAXEL

This is a taxane originally derived from the bark of the Pacific yew tree; now obtained semi synthetically from a taxane precursor derived from the needles of the European yew.
Indications: Primary treatment of advanced ovarian cancer in combination with cisplatin or carboplatin, primary adjuvant or second-line therapy of breast cancer and in combination with cisplatin or carboplatin, primary treatment of advanced non-small cell lung cancer; second-line treatment of AIDS-related Kaposi's sarcoma.
Cautions: Premedication with corticosteroids and antihistamines and a histamine H_2 receptor antagonist is recommended to reduce hypersensitivity reactions; continuous cardiac monitoring should be performed in patients who have experienced previous significant conduction abnormality while receiving pacitaxel.
Contra-indications: severe hepatic impairment; patients hypersensitive to polyethoxylated castor oil which is contained in formulation.
Side effect: myelosuppression; peripheral neuropathy; cardiac conduction defects, arrhythmias; hypersensitivity reactions.

- *Taxol 30mg/5ml, 16.7ml Vial For Injection.*

TOPOISOMERASE I INHIBITORS

IRINOTECAN HYDROCHLORIDE

This is a topoisomerase I inhibitor which inhibits nucleic acid synthesis by interfering with the coiling and uncoiling of DNA during replication.

Indications: metastatic colorectal cancer in combination with fluorouracil and folinic acid or where treatment containing fluorouracil has failed.
Cautions: raised plasma bilirubin concentration.
Contra-indications: chronic inflammatory bowel disease, bowel obstruction; high plasma bilirubin level; female patient should avoid conception for at least 3 months after cessation of treatment.
Side effect: acute cholinergic syndrome (with early diarrhoea) and delayed diarrhoea.

- *Campto 100mg/5ml Vial For Injection*

ANTIPROLIFERATIVE IMMUNOSUPPRESSANTS

AZATHIOPRINE

This a cytotoxic immunosuppressant with similar actions to those of mercaptopurine, to which it is converted in the body.
Indications: transplant recipient and also in a number of autoimmune conditions, usually when corticosteroid therapy alone has provided inadequate control.
Cautions: reduce dose in renal failure and when allopurinol is given concurrently; blood picture monitoring is necessary; hepatic and renal impairment; pregnancy.
Contra-indications: hypersensitivity to azathioprine or mercaptopurine.
Side effect: bone marrow depression (dose-related); hepatic toxicity, hyper-sensitivity reactions; hair loss; increased susceptibility to infections and colitis.
Dose: by mouth, autoimmune conditions, 1-3mg/kg daily. Suppression of transplant rejection, initially up to 5mg/kg then 1-4mg/kg daily according to response.

- *Imuran 50mg Tablet*

MYCOPHENOLATE

Indications: prophylaxis of acute renal, cardiac, or hepatic transplant rejection (in combination with cyclosporine and corticosteroids) under specialist supervision.
***Cautions*:** monitor full blood count every week for 4 weeks then twice a month for 2 months then every month

in the first year (consider interrupting treatment if neutropenia develops) exclude pregnancy**:** before starting treatment. elderly (increased risk of infection, gastro-intestinal haemorrhage and pulmonary oedema). children (higher incidence of side effects**:** may call for temporary reduction of dose or interruption). active serious gastro-intestinal disease (risk of haemorrhage, ulceration and perforation). delayed graft function. increased susceptibility to skin cancer (avoid exposure to strong sunlight. Bone marrow suppression: Patients should be warned to report immediately any signs or symptoms of bone marrow suppression e.g. infection or inexplicable bruising or bleeding.

Contra-indications: Hypersensitivity to mycophenolate mofetil, mycophenolic acid, mycophenolate sodium, or any component of the formulation.

Renal impairment: no data available in cardiac or hepatic transplant patients with renal impairment.

Pregnancy: Avoid (congenital malformations reported): effective contraception required before treatment, during treatment, and for 6 weeks after discontinuation of treatment. manufacturer of Myfortic also advise that men should use condoms during treatment and for 13 weeks after last dose.

Breast-feeding: Avoid (present in milk in animal studies)

Side Effects: taste disturbance, gingival hyperplasia, nausea, constipation, flatulence, anorexia, weight loss, vomiting, abdominal pain, gastro-intestinal inflammation, ulceration, and bleeding, hepatitis, jaundice, pancreatitis, stomatitis, oedema, tachycardia, hypertension, hypotension, vasodilatation, cough, dyspnea, insomnia, agitation, confusion, depression, anxiety, convulsions, paraesthesia, myasthenic syndrome, tremor, dizziness, headache, influenza-like syndrome, infections, hyperglycaemia, renal impairment, malignancy (particularly of the skin), blood disorders (including leucopenia, anaemia, thrombocytopenia, pancytopenia, and red cell aplasia, disturbances of electrolytes and blood lipids, arthralgia, alopecia, acne, skin hypertrophy, and rash also reported intestinal villous atrophy, progressive multifocal leucoencephalopathy, interstitial lung disease, pulmonary fibrosis.

Dose: Renal transplantation,

by mouth, 1 g twice daily starting within 72 hours of transplantation Or by intravenous infusion, 1 g twice daily starting within 24 hours of transplantation for max. 14 days (then transfer to oral therapy).
child and adolescent 2–18 years, by mouth 600 mg/m^2 twice daily (max. 2 g daily)
Note: Tablets and capsules not appropriate for dose titration in children with body surface area less than 1.25m^2 Cardiac transplantation: by mouth: ADULT over 18 years 1.5 g twice daily starting within 5 days of transplantation.Hepatic transplantation: by intravenous infusion ADULT over 18 years 1 g twice daily starting within 24 hours of transplantation for 4 days (up to max. 14 days) then by mouth, 1.5 g twice daily as soon as is tolerated

- *Mycophenolate 250mg, 500 mg.*

CORTICOSTEROIDS AND OTHER IMMUNOSUPPRESSANTS

BASILIXIMAB

is a monoclonal antibody
Indications: used for prophylaxis of acute rejection in allogeneic renal transplantation. It is given with cyclosporine and corticosteroid immunosuppression regimens.
Contraindicated: hypersensitivity to basiliximab or any other component of the formulation
Cautions: off-label use in cardiac transplantation (increased risk of serious cardiac side effects including cardiac arrest, atrial flutter, and palpitations).
Pregnancy Avoid (no information available)
adequate contraception must be used during treatment and for 16 weeks after last dose
Breast-feeding Avoid (no information available).
Side-effects severe hypersensitivity reactions and cytokine release syndrome have been reported
Dose By intravenous injection or by intravenous infusion: 20 mg within 2 hours before transplant surgery and 20 mg 4 days after surgery. withhold second dose if severe hypersensitivity or graft loss occurs. CHILD and ADOLESCENT 1–17 years: body-weight under 35 kg,

10 mg within 2 hours before transplant surgery and 10 mg 4 days after surgery; body-weight over 35 kg, adult dose

- *Simulect Injection, powder for reconstitution, 20-mg vial*

CICLOSPORIN (Cyclosporin)

This is a powerful immunosuppressant which appears to act specifically on lymphocyte, mainly helper T-cells. It has little effect on bone marrow but marked nephrotoxicity.

Indications: prevention of graft rejection following bone marrow, kidney, liver, pancreas, heart, and heart-lung transplantation, and for prophylaxis and treatment of graft-versus-host disease. Because of risk of anaphylaxis, IV infusion should only be used where oral ingestion is not feasible in immediate post-operative period or where gastro-intestinal absorption is impaired. Such patients should be switched to oral therapy as soon as possible.

Cautions: increased susceptibility to infections and lymphomas especially when administered with the immunosuppressive agents due to over suppression; avoid during pregnancy, breast-feeding***:*** or with systemic nephrotoxic antibiotics; avoid other immunosuppressant except cortico-steroids; monitor liver and kidney functions.

Contra-indications: uncontrolled hypertension; uncontrolled infections, and malignancy; renal impairment.

Side effect: hepatic and renal impairment; tremor, gastrointestinal disturbances, hypertrichosis; gum hyperplasia; hyperkalaemia; occasionally facial oedema, hypertension, fluid retention, and convulsion; serum creatinine, bilirubin, and liver enzymes may be increased; burning sensation in hands and feet during first week of oral administration.

Dose: Orally should be given 4-12 hours prior to transplantation as a single dose of 15mg/kg. By IV injection it should be given 4-12 hours prior to transplantation as a single IV dose of 5-6mg/kg/day. This daily single dose is continued postoperatively until the patient can tolerate the soft gelatin capsules or oral solution.

- *Neoral 25mg-, 50mg-, 100mg Capsules*

- *Neoral 100mg/ml susp 50ml*
- *Sandimmune 50mg/ml For Intravenous Infusion*

PREDNISOLONE

Indications: Acute lymphoblastic leukemia, Hodgkin's disease and non-Hodgkin lymphomas, hormone-sensitive breast cancer, palliation of symptomatic end stage malignant disease when it may produce a sense of well-being, prevention of organ transplant rejection; in high doses it is used to treat rejection episodes, systemic lupus erythematosus, chronic active hepatitis, rheumatoid arthritis and acute immune hemolytic anemia.
Dose: the dose used depends on the disease, its severity and the clinical response expected. Divided dosage is usually employed. Short term treatment, 20-30mg daily for few days then reduced by 2.5-5mg every 2-5 days depending on response. Rheumatoid arthritis, 20-30mg daily.
Maintenance, lowest effective dose. Most other conditions, 10-100mg daily for 1-3 weeks then reduced to most effective dose.

- *Precortisyl 1mg, 5mg, 20mg-Tablets.*
- *Prednisolone 15mg/5ml syrup.*
- *Prednisolone 0.2% Retention Enema.*

SIROLIMUS

This is a macrolide compound obtained from Streptomyces hygroscopicus with potent immunosuppressant properties.
Indications: prophylaxis of organ rejection in patients receiving renal transplants.
Cautions: monitor kidney function when given with cyclosporine; hepatic impairment, renal impairment.
Contra-indications: pregnancy; breastfeeding.
Side effect: gastrointestinal disturbances, tremor, acne, impaired renal function, hyperlipidaemia, peripheral oedema, headache, pain, asthenia and hypertension.
Dose: initial 6mg after surgery, then 2mg once daily.

- *Sirolimus "Rapamune"1mg Tablet*

TACROLIMUS

This is a potent macrolide immunosuppressant derived from *Streptomyces tsukabaensis*, and has actions similar to those of cyclosporine.

Indications: prophylaxis organ rejection in patients receiving allogenic liver or kidney transplants. Used in conjunction with adrenal corticosteroids.

Cautions: Cardiomyopathy has been reported in children given tacrolimus after transplantation. Patients should be monitored carefully by echocardiography for hypertrophic changes; dose reduction or discontinuation should be considered if these occur. Monitor visual status, blood glucose, hematological and neurological parameters.

Contra-indications: hypersensitivity to macrolides; hypersensitivity (risk of anaphylaxis) to polyoxyl 60 hydrogenated castor oil, which is present in the injection; avoid concurrent use with cyclosporine (additive nephrotoxicity).

Side Effects: include gastrointestinal disturbances like dyspepsia, and inflammatory & ulcerative disorders; hepatic dysfunction, jaundice, bile duct and gall bladder abnormalities; hypertension; cardimyopathy.

Dose: 100 – 300 mcg/kg daily in 2 divided doses orally; or by IV infusion over 24 hrs. 10 – 50 mcg/kg.

- *Tarcolimus 0, 5mg & 1mg Tablets.*
- *Prograf 0, 5mg & 1mg Tablets.*

OTHER IMMUNOMODULATING DRUGS

FINGOLIMOD

Sphingosine 1-Phosphate (S1P) Receptor Modulator.

Indications: Multiple sclerosis**:** Treatment of relapsing forms of multiple sclerosis (MS) to reduce the frequency of clinical exacerbations and to delay the accumulation of physical disability.

Cautions*:* susceptibility to QT-interval prolongation (including electrolyte disturbances, concomitant use of drugs that prolong QT interval).

severe respiratory disease

pulmonary fibrosis.

chronic obstructive pulmonary disease.

risk of macular oedema—eye examination recommended 3–4 months after initiation of treatment (and before initiation of treatment in patients with diabetes or history of uveitis)
monitor hepatic transaminases before treatment, then every 3 months for 1 year, then periodically thereafter.
monitor full blood count before treatment, at 3 months, then at least yearly thereafter and if signs of infection—interrupt treatment if lymphocyte count reduced—.
monitor for signs and symptoms of haemophagocytic syndrome (including pyrexia, asthenia, hepato-splenomegaly and adenopathy—may be associated with hepatic failure and respiratory distress
also progressive cytopenia, elevated serum-ferritin concentrations, hypertriglyceridaemia, hypofibrinogenaemia, coagulopathy, hepatic cytolysis, hyponatraemia)—initiate treatment immediately; check varicella zoster virus status— for further information.
Contra-indications: immunosuppression; active infection; active malignancies (except cutaneous basal cell carcinoma). Hepatic impairment: use with caution in mild to moderate impairment and avoid in severe impairment.
Pregnancy: avoid (toxicity in animal studies)**:** exclude pregnancy**:** before treatment and ensure effective contraception during and for at least 2 months after treatment.
Breast-feeding: avoid
Side Effects: Most common**:** Central nervous system**:** Headache. Gastrointestinal**:** Diarrhea. Hepatic**:** Increased ALT, increased AST. Neuromuscular & skeletal**:** Back pain Miscellaneous**:** Flu-like syndrome. Less common**:** Cardiovascular**:** Hypertension, bradycardia. Central nervous system**:** Depression, dizziness, migraine. Dermatologic**:** Alopecia, eczema, pruritus. Endocrine & metabolic**:** Increased triglycerides. Gastrointestinal**:** Gastroenteritis, weight loss. Hematologic**:** Lymphopenia, leukopenia. Hepatic**:** Increased GGT. Neuromuscular & skeletal**:** Paresthesia, weakness. Ocular**:** Blurred vision, eye pain. Respiratory**:** Cough, bronchitis, dyspnea, sinusitis. Miscellaneous**:** Herpes infection, tinea infection. Rare**: (**Limited to important or life-threatening)**:** Asystole, AV block, death, lymphoma, macular edema

(incidence increased in patients with uveitis or diabetes mellitus), QT prolongation, syncope.
Dose: ADULT over 18 years**:** 500 micrograms once daily.

- *Gilenya Capsules 500 micrograms*

GLATIRAMER ACETATE

Indications: for treating initial symptoms in patients at high risk of developing multiple sclerosis, and also for reducing the frequency of relapses in ambulatory patients with relapsing-remitting multiple sclerosis who have had at least 2 clinical relapses in the past 2 years.
Cautions: cardiac disorders
Renal impairment: no information available—manufacturer advises caution
Pregnancy: manufacturer advises avoid—no information available
Breast-feeding: manufacturer advises caution—no information available
Side Effects: hypersensitivity reactions; flushing, chest pain, palpitation, tachycardia, and dyspnea may occur within minutes of injection; nausea, constipation, dyspepsia; syncope, anxiety, asthenia, depression, headache, tremor, sweating; oedema, lymphadenopathy; hypertonia, back pain, arthralgia, influenza-like symptoms; injection-site reactions, rash; *rarely* seizures
Dose: By subcutaneous injection, ADULT over 18 years, 20 mg daily

- *Copaxone 20 mg/ml, 1-ml prefilled syringe*

INTERFERON BETA

Interferon beta-1a & beta-1b have antiviral and immunomodulating activities; mainly used in the management of multiple sclerosis
Indications: interferon beta–1a is used in relapsing remitting multiple sclerosis whereas interferon beta-1b is used in both relapsing – remitting and in secondary progressive multiple sclerosis.
Contra-indications: consult product/specialist literature
Side effect: The most frequently reported side effects include irritation at injection site (inflammation, hypersensitivity and necrosis), influenza-like symptoms, nausea, and vomiting. Other side effects include

hypersensitivity reactions (anaphylaxis and urticaria), blood disorders, menstrual disorders, mood and convulsions, alopecia, hepatitis, and thyroid dysfunction.

- *Avonex (Interferon Beta-1a) 30 mcg (6MIU) & 60 mcg (12MIU) Prefilled Syringe For IM Injection.*
- *Betaferon (Interferon Beta-1b) 300 mcg (9.6MIU) Vial With Diluent) For Subcutaneous Injection.*

PEGINTERFERON ALFA

Peginterferon Alfa-2a and Alfa-2b are polyethylene glycol conjugated 'pegylated' derivatives of interferon alfa. Pegylation increases the persistence of the interferon in the blood.

Indications: combined with ribavirin for chronic hepatitis C, as monotherapy if ribavirin is not tolerated or contraindicated.

Cautions: interferon alfa for either monotherapy or combined therapy should be used only if neutropenia and thrombocytopenia are a particular risk.

Contra-indications: consult product/specialist literature.

Side Effects: side effects are dose-related, but commonly include anorexia, nausea, influenza-like symptoms, and lethargy. Ocular side effects, depression (including suicidal behaviour), myelosuppression, cardiovascular problems, nephrotoxicity and hepatotoxicity have been reported. Hypertriglyceridaemia, sometimes severe, has been observed. Other side effects include hypersensitivity reactions, thyroid abnormalities, hyperglycaemia, alopecia, psoriasiform rash, confusion, coma and seizures.

- *Pegasys (Peginterferon Alfa – 2a) 180 mcg Prefilled Syringe, For Subcutaneous Injection.*
- *Peginferon (Peginterferon Alfa – 2b) 120 mcg & 150 mcg Vial, For Subcutaneous Injection.*

SEX HORMONES AND HORMONE ANTAGONISTS IN MALIGNANT DISEASE

ANTIANDROGEN

ABIRATERONE ACETATE

Indications: Prostate cancer***:*** Treatment of metastatic, castration-resistant prostate cancer (in combination with prednisone).
Cautions: monitor blood pressure, serum potassium concentration, and fluid balance before treatment, and at least monthly during treatment— for management of hypertension, hypokalaemia and oedema; history of cardiovascular disease—correct hypertension and hypokalaemia before treatment (if significant risk of congestive heart failure, such as history of cardiac failure, uncontrolled hypertension or cardiac events, for management and increased monitoring); diabetes (increased risk of hyperglycaemia—monitor blood sugar frequently); concurrent chemotherapy—safety and efficacy not established; increased risk of myopathy and rhabdomyolysis with possible renal failure (caution with concomitant use of drugs known to be associated with myopathy or rhabdomyolysis) monitor liver function before treatment, then every 2 weeks for the first 3 months of treatment, then monthly thereafter—interrupt treatment if serum alanine aminotransferase or aspartate aminotransferase greater than 5 times the upper limit (for details of restarting treatment at a lower dose) and discontinue permanently if 20 times the upper limit.
Contra-indications: Women who are or may become pregnant
Canadian labeling***:*** Additional contraindication (not in U.S. labeling)***:*** Hypersensitivity to abiraterone acetate or any component of the formulation or container.
Renal impairment: No dosage adjustment necessary.
Hepatic Impairment hepatic impairment prior to treatment initiation:
Mild (Child-Pugh class A)***:*** No dosage adjustment necessary. Moderate (Child-Pugh class B)***:*** 250 mg once daily. Permanently discontinue if ALT and/or AST >5 times the upper limit of normal (ULN) or total bilirubin

>3 times ULN during treatment.Severe (Child-Pugh class C)*:* Avoid use Hepatotoxicity during treatment: ALT and/or AST >5 times ULN or total bilirubin >3 times ULN*:* Withhold treatment until liver function tests return to baseline or ALT and AST ≤2.5 times ULN and total bilirubin ≤1.5 times ULN, then reinitiate at 750 mg once daily.
Recurrent hepatotoxicity on 750 mg/day*:* Withhold treatment until liver function tests return to baseline or ALT and AST ≤2.5 times ULN and total bilirubin ≤1.5 times ULN, then reinitiate at 500 mg once daily.
Recurrent hepatotoxicity on 500 mg once daily*:* Discontinue treatment
Side Effects: Note*:* Adverse reactions reported for use in combination with prednisone. MOST COMMON*:* Cardiovascular*:* Edema, hypertension. Central nervous system*:* Fatigue, insomnia. Dermatologic*:* Bruise. Endocrine & metabolic*:* Hypertriglyceridemia, hyperglycemia, hypernatremia, hypokalemia, hypophosphatemia, hot flash. Gastrointestinal*:* Constipation, diarrhea, dyspepsia. Genitourinary*:* Urinary tract infection. Hematologic & oncologic*:* Lymphocytopenia. Hepatic*:* Increased serum ALT, increased serum AST. Neuromuscular & skeletal*:* Joint swelling (including joint discomfort), myalgia. Respiratory*:* Cough, upper respiratory infection, dyspnea, nasopharyngitis. MOST COMMON*:* Cardiovascular*:* Cardiac arrhythmia, chest pain (including chest discomfort), cardiac failure. Central nervous system*:* Falling. Dermatologic*:* Skin rash. Genitourinary*:* Hematuria, groin pain, polyuria, nocturia. Hepatic*:* Increased serum bilirubin. Neuromuscular & skeletal*:* Bone fracture. Miscellaneous*:* Fever. RARE*:* (Limited to important or Life threatening)*:* Adrenocortical insufficiency, hypersensitivity pneumonitis, noninfectious
Dose: Prostate cancer, metastatic, castration-resistant*:* Oral*:* 1000 mg once daily (in combination with prednisone) Dosage adjustment for concomitant strong CYP3A4 inducers*:* Avoid concomitant strong CYP3A4 inducers; if a strong CYP3A4 inducer must be administered concurrently, increase the abiraterone frequency to twice daily (eg, from 1000 mg once daily to

1000 mg twice daily). Upon discontinuation of the strong CYP3A4 inducer, reduce abiraterone back to the prior dose and frequency.

- *Zytiga Tablets 250 mg* .

BICALUTAMIDE

Indications: Treatment of metastatic prostate cancer (in combination with an LHRH agonist).
Cautions: consider periodic liver function tests
Contra-indications: Hypersensitivity to bicalutamide or any component of the formulation; use in women, especially women who are or may become pregnant.
Side Effects: nausea, diarrhoea, cholestasis, jaundice; asthenia, weight gain; gynaecomastia, breast tenderness, hot flushes, impotence, decreased libido; anaemia; alopecia, dry skin, hirsutism, pruritus; less commonly vomiting, abdominal pain, dyspepsia, interstitial lung disease, pulmonary fibrosis, depression, haematuria, thrombocytopenia, hypersensitivity reactions including angioneurotic oedema and urticaria; rarely cardiovascular disorders (including angina, heart failure, and arrhythmias), and hepatic failure.
Dose: Locally advanced prostate cancer at high risk of disease progression***:*** 150 mg once daily locally advanced, non-metastatic prostate cancer when surgical castration or other medical intervention inappropriate***:*** 150 mg once daily. Advanced prostate cancer***:*** in combination with gonadorelin analogue or surgical castration, 50 mg once daily

- *Casodex Tablets 50 mg*

BREAST CANCER

FULVESTRANT

Estrogen Receptor Antagonist
Indications: treatment of oestrogen-receptor-positive metastatic or locally advanced breast cancer in postmenopausal women in whom disease progresses or relapses while on, or after, other anti-oestrogen therapy
Cautions: Bleeding disorders***:*** Use with caution in patients with a history of bleeding disorders (including thrombocytopenia) and/or patients on anticoagulant

therapy; bleeding/hematoma may occur from IM administration.
Hepatic impairment: Use with caution in patients with hepatic impairment; dosage adjustment is recommended in patients with moderate impairment. Safety and efficacy have not been established in severe impairment.
Special handling:
Hazardous agent***:*** Use appropriate precautions for handling and disposal
Contra-indications: Hypersensitivity to fulvestrant or any component of the formulation
Hepatic impairment: manufacturer advises caution in mild to moderate impairment (avoid in severe impairment).
Renal impairment: manufacturer advises caution if creatinine clearance less than 30 ml/minute—no information available
Pregnancy: manufacturer advises avoid—increased incidence of fetal abnormalities and death in animal studies
Breast-feeding: manufacturer advises avoid—present in milk in animal studies
Side Effects: nausea, vomiting, diarrhoea; venous thromboembolism; anorexia, headache, asthenia; urinary-tract infections; hot flushes; back pain; rash, injection-site reactions, hypersensitivity reactions.
Less commonly***:*** vaginal haemorrhage, vaginal candidiasis, and leucorrhoea.
Dose: By deep intramuscular injection into buttock, 500 mg every 2 weeks for the first 3 doses, then 500 mg every month
Note 500 mg dose should be administered as one 250-mg injection (slowly over 1–2 minutes) into each buttock
Maintenance,

- *Faslodex 250mg prefilled syringe inj.*

AROMATASE INHIBITOR

ANASTROZOLE

Indications: Breast cancer***:*** First-line treatment of locally-advanced or metastatic breast cancer (hormone receptor-positive or unknown) in postmenopausal women

Adjuvant treatment of early hormone receptor-positive breast cancer in postmenopausal women. Treatment of advanced breast cancer in postmenopausal women with disease progression following tamoxifen therapy
Contra-indications: not for premenopausal women
Hepatic impairment: avoid in moderate to severe impairment
Renal impairment: avoid if creatinine clearance less than 20 ml/minute
Pregnancy; avoid
Breast-feeding; avoid
Side Effects: hot flushes, vaginal dryness, vaginal bleeding, hair thinning, anorexia, nausea, vomiting, diarrhoea, headache, arthralgia, arthritis, bone fractures, bone pain, rash (including Stevens-Johnson syndrome), cutaneous vasculitis; asthenia and drowsiness—may initially affect ability to drive or operate machinery; slight increases in total cholesterol levels reported; very rarely allergic reactions including angioedema and anaphylaxis.
Dose: 1 mg daily

- *Arimidex Tablets1mg.*

LETROZOLE

This is a nonsteroidal inhibitor of the aromatase (oestrogen synthetase) system.
Indications: advanced breast cancer in postmenopausal women (including those in whom other anti-oestrogen therapy has failed); early invasive breast cancer in postmenopausal women after standard adjuvant Tamoxifen therapy; pre-operative therapy to those with localized hormone receptor positive disease, to allow subsequent breast conserving surgery.
Cautions: severe renal impairment
Contra-indications: severe hepatic impairment; not indicated for pre-menopausal women, pregnancy & breast feeding.
Side Effects: hot flushes, nausea, vomiting, fatigue, headache, dyspepsia, constipation, diarrhoea, depression, anorexia, appetite increase, hypercholesterolemia, alopecia, increased sweating, rash, peripheral oedema, musculoskeletal pain, osteoporosis, bone fracture etc.
Dose: Po 2.5mg daily, (for 3 years after tamoxifen), discontinue if tumour progression occurs.

- *Femera 2.5mg Tablet.*

PROSTATE CANCER

ALPHA-ADRENOCEPTOR BLOCKING DRUGS

ALFUZOSIN HYDROCHLORIDE

Indications: relax smooth muscle in benign prostatic hyperplasia producing an increase in urinary flow-rate and an improvement in obstructive symptoms.
Cautions: Since alpha1-selective alpha blockers reduce blood pressure, patients receiving antihypertensive treatment may require reduced dosage and specialist supervision. Caution is required in the elderly and in patients undergoing cataract surgery (risk of intra-operative floppy iris syndrome).
Contra-indications: Alpha-blockers should be avoided in patients with a history of postural hypotension and micturition syncope.
Hepatic impairment: initial dose 2.5mg once daily, adjusted according to response to 2.5mg twice daily in mild to moderate impairment—avoid if severe; avoid modified-release preparations
Renal impairment: initial dose 2.5mg twice daily and adjust according to response; manufacturers advise avoid use of modified-release preparations if eGFR less than 30 ml/minute/1.73m^2 as limited experience
Side Effects: Side Effects: of alpha1-selective alpha blockers include drowsiness, hypotension (notably postural hypotension), syncope, asthenia, dizziness, depression, headache, dry mouth, gastro-intestinal disturbances, oedema, blurred vision, intra-operative floppy iris syndrome (most strongly associated with tamsulosin), rhinitis, erectile disorders (including priapism), tachycardia, and palpitations. Hypersensitivity reactions including rash, pruritus and angioedema have also been reported.
Dose: benign prostatic hyperplasia 10 mg once daily Acute urinary retention associated with benign prostatic hyperplasia in men over 65 years, 10 mg once daily for 2–3 days during catheterisation and for one day after removal; max. 4 days First dose effect First dose may

cause collapse due to hypotensive effect (therefore should be taken on retiring to bed). Patient should be warned to lie down if symptoms such as dizziness, fatigue or sweating develop, and to remain lying down until they abate completely

- *Xatral XL 10 mg Tablets*

TAMSULOSIN HYDROCHLORIDE

Indications: relax smooth muscle in benign prostatic hyperplasia producing an increase in urinary flow-rate and an improvement in obstructive symptoms
Cautions: see alfuzosin
Contra-indications: Alpha-blockers should be avoided in patients with a history of postural hypotension and micturition syncope
Side Effects: Side Effects: of alpha1-selective alpha blockers include drowsiness, hypotension (notably postural hypotension), syncope, asthenia, dizziness, depression, headache, dry mouth, gastro-intestinal disturbances, oedema, blurred vision, intra-operative floppy iris syndrome (most strongly associated with tamsulosin), rhinitis, erectile disorders (including priapism), tachycardia, and palpitations. Hypersensitivity reactions including rash, pruritus and angioedema have also been reported.
Dose: 400 micrograms daily

- *Astellas 400 micrograms Tablets*

PROSTATE CANCER & GONADORELLIN ANALOGUES

GOSERELIN

This is an analogue of gonadorelin with similar properties.
Indications: prostate cancer; advanced breast cancer in pre- and peri- menopausal women and in the management of endometriosis and uterine fibroids.
Cautions: patients with metabolic bone disease (decrease in bone mineral density may occur); injection site should be rotated.
Side effect: hot flushes, decreased libido, breast swelling and tenderness; skin rashes.

Dose: advanced breast cancer and prostate cancer by SC injection into anterior abdominal wall, 3.6mg every 28 days.

- *Zoladex 3.6mg for Injection*

TRIPTORELIN

This is a synthetic analogue of gonadotropin-releasing hormone (GnRH) that acts as a potent inhibitor of gonadotropin.
Indications: advanced prostate cancer; endometriosis; precocious puberty, reduction in size of uterine fibrosis
Cautions: Men at risk of tumour 'flare' should be monitored closely during first month of therapy. In patients with bone disease because reduction in bone mineral density can occur. The injection site should be rotated.
Side effect: Transient hypertension, dry mouth, paraesthesia, increased dysuria, gynaecomastia.
Dose: advanced prostate cancer***:*** 3mg every 4 weeks. Endometriosis and reduction in uterine fibroids***:*** 3mg every 4 weeks starting during first 5 days of menstrual cycle. Max. duration of treatment – 6 months.

- *Decapeptyl SR 3mg Vial For IM Injection.*
- *Gonapeptyl Depot 3.75-mg prefilled syringe (with prefilled syringe of vehicle*

SOMATOSTATIN ANALOGUES

OCTREOTIDE ACETATE

This is an octapeptide analogue of somatostatin with similar properties but a longer duration of action.
Indications: symptomatic treatment of diarrhoea associated with carcinoid tumour, treatment of profuse diarrhoea associated with vasoactive intestinal peptide tumours (VIPoma); reduce blood levels of growth hormone in acromegaly.
Cautions: monitored for signs of tumour expansion (visual field defects), ultrasound of gall bladder is recommended before and at intervals of 6-12 months during treatment.hepatic impairment; pregnancy; breast feeding. Monitor thyroid functions on long term therapy.

Side effect: gastrointestinal disturbances including anorexia, nausea, vomiting, abdominal pain, bloating, flatulence, diarrhoea, and steatorrhoea may occur. Postprandial glucose tolerance may be impaired and persistent hyperglycaemia occurs with chronic administration (rare). Gallstones have been reported after long-term treatment. Pain and irritation may occur at the injection site.

- *Sandostatin Lar 20mg Vial (Depot Preparation) For Injection.*

BONE MODULATING DRUGS

ZOLEDRONIC ACID

This is an aminobisphosphonate which is a potent inhibitor of bone resorption.
Indications: reduction of bone damage in advanced malignancies involving bone; hypercalcaemia of malignancy.
Cautions: monitor serum electrolytes, calcium, phosphate and magnesium; assess renal function before each dose; ensure adequate hydration; renal impairment; cardiac disease (avoid fluid overload).
Side Effects: hypophosphotaemia, anaemia, influenza-like symptoms; gastrointestinal disturbances, headache, conjunctivitis; renal impairment. Osteonecrosis of the jaw reported in cancer patients being treated with bisphosphonate; consider dental examination and preventive treatment before initiating bisphosphonate; avoid invasive dental procedures during treatment.
Dose: IV infusion of 4mg every 3-4 weeks (reduction of bone damage in advanced malignancies) and 4mg as a single dose (hypercalcaemia of malignancy)

- *Zometa 4mcg/ml (4mg, 5mg Vial) For IV Infusion.*

ANTIMETABOLITES AND RELATED THERAPY

CALCIUM FOLINATE (CALCIUM LEUCOVORIN))

Indications: High dose methotrexate therapy (folate rescue); inadvertent overdose of methotrexate; with

fluorouracil in the palliative treatment of advanced colorectal cancer.
Cautions: not indicated for pernicious anaemia or other megaloblastic anaemias due to vitamin B_{12} deficiency; pregnancy; breastfeeding.
Contra-indications: intrathecal injection is contraindicated.
Side effect: allergic reactions; pyrexia after parenteral administration

- *Folinic Acid 10mg/ml, 30ml vial, For IM, IV* or *Infusion.*

PEMETREXED

Indications: Mesothelioma**:** Treatment of unresectable malignant pleural mesothelioma (in combination with cisplatin) Nonsmall cell lung cancer (NSCLC), nonsquamous**:** Treatment of locally advanced or metastatic nonsquamous NSCLC (as initial treatment in combination with cisplatin, as single-agent maintenance treatment after 4 cycles of initial platinum-based double therapy, and single-agent treatment after prior chemotherapy). Limitation of use**:** Not indicated for the treatment of squamous cell NSCLC.
Cautions: history of cardiovascular disease; diabetes; prophylactic folic acid and vitamin B12 supplementation required, concomitant nephrotoxic drugs including non-steroidal anti-inflammatory drugs.
Contra-indications: Severe hypersensitivity to pemetrexed or any component of the formulation. Canadian labeling (additional contraindications; not in U.S. labeling)**:** Concomitant yellow fever vaccine
Obesity**:** ASCO Guidelines for appropriate chemotherapy dosing in obese adults with cancer**:**
Utilize patient's actual body weight (full weight) for calculation of body surface area- or weight-based dosing, particularly when the intent of therapy is curative.
manage regimen-related toxicities in the same manner as for nonobese patients.
if a dose reduction is utilized due to toxicity, consider resumption of full weight-based dosing with subsequent cycles, especially if cause of toxicity (eg, hepatic or renal impairment) is resolved.

Renal impairment: CrCl ≥45 ml/minute**:** No dosage adjustment necessary.
CrCl <45 ml/minute**:** Use is not recommended (an insufficient number of patients have been studied for dosage recommendations).
Concomitant NSAID use with renal dysfunction:
CrCl ≥80 ml/minute**:** No dosage adjustment necessary.
CrCl 45 to 79 ml/minute and NSAIDs with short half-lives (eg, ibuprofen, indometacin, ketoprofen, ketorolac)**:** Avoid NSAID for 2 days before, the day of, and for 2 days following a dose of pemetrexed.
Any creatinine clearance and NSAIDs with long half-lives (eg, nabumetone, naproxen, oxaprozin, piroxicam)**:** Avoid NSAID for 5 days before, the day of, and 2 days following a dose of pemetrexed.
Hepatic impairment: Grade 3 (5.1 to 20 times ULN) or 4 (>20 times ULN) transaminase elevation during treatment**:** Reduce pemetrexed dose to 75% of previous dose (and cisplatin).
Side Effects: gastro-intestinal disturbances; oedema; neuropathy; dehydration; conjunctivitis, increased lacrimation; skin disorders; less commonly colitis, arrhythmias, and interstitial pneumonitis; rarely hepatitis; peripheral ischaemia, acute renal failure, Stevens-Johnson syndrome and toxic epidermal necrolysis also reported.
Dose: Adult**:** Note**:** Start vitamin supplements 1 week before initial pemetrexed dose Folic acid 400 to 1000 mcg daily orally (begin 7 days prior to treatment initiation; continue daily during treatment and for 21 days after last pemetrexed dose) and vitamin B_{12} 1000 mcg IM 7 days prior to treatment initiation and then every 3 cycles. Give dexamethasone 4 mg orally twice daily for 3 days, beginning the day before treatment to minimize cutaneous reactions. New treatment cycles should not begin unless ANC ≥1500/mm^3, platelets ≥100, 000/mm^3, and Cl_{cr} ≥45 ml/minute.
Malignant pleural mesothelioma (IV)**:** 500 mg/m^2 on day 1 of each 21-day cycle (in combination with cisplatin) or (unlabeled) in combination with carboplatin 2006) or (unlabeled) as single-agent therapy.
Nonsmall cell lung cancer, nonsquamous (IV)**:**
Initial treatment**:** 500 mg/m^2 on day 1 of each 21-day cycle (in combination with cisplatin)

Maintenance or second-line treatment**:** 500 mg/m^2 on day 1 of each 21-day cycle (as a single-agent)
Bladder cancer, metastatic (unlabeled use)**:** IV**:** 500 mg/m^2 on day 1 of each 21-day cycle until disease progression or unacceptable toxicity.
Cervical cancer, persistent or recurrent (unlabeled use)**:** IV**:** 500 mg/m^2 on day 1 of each 21-day cycle until disease progression or unacceptable toxicity occurs (Lorusso, 2010) or 900 mg/m^2 on day 1 of each 21-day cycle (Miller, 2008)
Ovarian cancer, platinum-resistant (unlabeled use) (IV)**:** 500 mg/m^2 on day 1 of each 21-day cycle (Vergote, 2009)
Thymic malignancies, metastatic (unlabeled use) (IV)**:** 500 mg/m^2 on day 1 of each 21-day cycle for 6 cycles or until disease progression or unacceptable toxicity occurs.

- *Alimta injection, powder for reconstitution 500 mg vial*

DRUGS USED IN NETUROPENIA

LENOGRASTIM

This is a glycosylated recombinant human granulocyte-colony stimulating factor (rhG-CSF).
Indications: to treat or prevent neutropenia in patients receiving myelosuppressive cancer chemotherapy and to reduce the period of neutropenia in patients undergoing bone marrow transplantation.
Cautions: pre-malignant myeloid conditions; reduced myeloid precursors; sickle cell disease; monitor spleen size (risk of splenic rapture).

- *Granocyte 33.6 Million Unit (263 mcg) -Vial For Injection.*

DRUGS USED IN UROTHELIAL TOXICITY

MESNA

Indications: urothelial toxicity associated with the use of cyclophosphamide or ifosfamide. (urothelial toxicity is manifested by haemorrhagic cystitis and is caused by the metabolite acrolein).
Contra-indications: hypersensitivity to thiol-containing compounds.

Side effect: above max. therapeutic doses, gastro-intestinal disturbances, fatigue, headache, limb pains, depression, irritability, hypotension and tachycardia, and skin rash.
Dose: given simultaneously with cyclophosphamide or ifosfamide, and further doses are given orally or intravenously 4 and 8 hours after treatment. For oral administration, the contents of ampoule are taken in fruit juice.

- *Uromitexan 100mg/ml In 4-ml & 10-ml Ampoules For Injection*

9 - NUTRITION AND BLOOD

NUTRITIOANL AGENT AND VITAMINS

ALFACALCIDOL 1-ALPHA-HYDROXY-CHOLECALCIFEROL

Indications: renal osteodystrophy, hyperparathyroidism with bone disease, hypoparathyroidism; neonatal hypocalcaemia; nutritional and malabsorption rickets and osteomalacia; pseudo-deficiency (D-dependent) rickets and osteomalacia; hypophosphataemic vit-D resistant rickets and osteomalacia.
Cautions: high systemic doses may cause hypercalcaemia in infant.
Contra-indications: hypercalcaemia; metastatic calcification; breast-feeding.
Side Effects: symptoms of overdosage include anorexia, lassitude, nausea and vomiting, diarrhoea, weight loss, polyuria, sweating, headache, thirst, vertigo, and raised concentrations of calcium and phosphate in plasma and urine.
Dose: adult and children over 20 kg, initially 1 mcg daily, adjusted according to response.
Child under 20 kg, 0.05 mcg/kg/day.
Maintenance, 0.25-1 mcg daily.
Note: 1mg = 40, 000 units

- *One-Alpha Drops 2 mcg/ml (0.1 mcg/Drop)*

CALCITRIOL (1, 25-Dihydroxycholecalciferol)

Indications: vitamin D deficiency. management of postmenopausal osteoporosis.
Cautions: monitor plasma calcium, phosphate, and creatinine during dosage titration
Note: All patients receiving pharmacological doses of vitamin D should have their plasma-calcium concentration checked at intervals (initially once or twice weekly) and whenever nausea or vomiting occur
Contra-indications: hypercalcaemia; metastatic calcification
Side Effects: symptoms of overdosage include anorexia, lassitude, nausea and vomiting, diarrhoea, constipation,

weight loss, polyuria, sweating, headache, thirst, vertigo, and raised concentrations of calcium and phosphate in plasma and urine

Dose: By mouth, renal osteodystrophy, initially 250 nanograms daily, or on alternate days (in patients with normal or only slightly reduced plasma-calcium concentration), increased if necessary in steps of 250 nanograms at intervals of 2–4 weeks; usual dose 0.5–1 microgram daily

- *Rocaltrol Capsules, 250 nanograms, 500 nanograms*

AMINO ACIDS

Indications: prophylaxis and therapy of protein deficiency, i.e. in pre- and post-perative as well as post-traumatic situations like burns, tetanus, osteomyelitis, malabsorption, maldigestion, intoxications, nephrosis, under dialysis treatments

Cautions: the compatibility of any additive to this solution should be checked before use.

Contra-indications: advanced liver disease, disturbed protein metabolism, manifest cardiac insufficiency, renal insufficiency with increased rest nitrogen values, acidosis, hyperhydration.

Dose: IV, up to 30ml/kg body weight/day at a drop rate of 40-60 drops/minute or 120-180ml/hour.

- *Aminoplasmal 5% E, -10% E*

ARGININE HYDROCHLORIDE

L-arginine is naturally occurring amino acid

Indications*:* as an intravenous stimulant to the pituitary for the release of human growth hormoe in patients where the measurmemet of pituitary reserve for HGH can be used of diagnostic. Used as a diagnostic aid in such conditions

Cautions**:** is hypertonic and acidic solution can cause irritating and damage to tissues.

Contra-indications: hypersensitivity

Side Effects: non specific effects are nausea, vomiting, headache, flushing numbness and local venous irritation.

Dose: Adult dose 30g by intravenous infusion over 30 minutes. Total dose should not exceed 30g Child; from

59kg or less base on weight from 60kg or more recommended dose is 30g.

- *R-Gene 10 Injection for intravenous*

SODIUM BENZOATE

Indications: maintenance treatment of hyperammonemia in patients with urea cycle disorders involving deficiencies of the following enzymes; carbamoyl phosphate synthetase, ornitihine trascarbamylase, argininosuccinic acid synthetase, arginosuccinase, arginase, N-acetyglutamate synthetase

Contra-indications: hypersensitivity, risk of kernicterus metabolic acidosis

Side Effects: Nausea and vomiting overdose may include anorexia, irritability lethargy renal tubular dysfunction hypokalemia, hypocalcaemia, coma and metabolic acidosis.

Dose: Neonate – adult: 50mg-150mg /kg 3-4 times daily.

Maintenance,

- *Amzoate 500mg/ 5ml oral liquid*

CYANOCOBALAMIN (Vitamin B_{12}))

Indications: addisonian pernicious anemia, subacute combined degeneration of the spinal cord, other causes of vitamin B_{12} deficiency.

Contra-indications: Sensitivity to cobalt and/or vitamin B***12***.

Side Effects: Mild diarrhea, itching, temporary feeling of warmth and pain at the injection site may occur.

Dose: Avoid using the intravenous route

- *Cyanocobalamin 1000 mcg/ml Injection, USP*

DEXTROSE (Glucose))

Indications: energy and liquid supply, hypertonic dehydration, carbohydrate therapy/high-caloric alimentation, vehicle solution for supplementary medication, hypoglycaemia.

Cautions: the compatibility of any additive to this solution should be checked before use. These products should not be administered through the same infusion equipment, simultaneously, before, or after an

administration of blood, because of the possibility of pseudo-agglutination. Electrolytes have to be administered as required, and patient should be monitored for hyperglycemia and glucosuria.
Contra-indications: hyperglycaemia, diabetes mellitus, hypotonic dehydration; if electrolytes lacking do not administer simultaneously; hyperhydration, hypokalemia, hyperosmolar coma.
Side Effects: exceeding the specified dosage may lead to enhanced values of serum bilirubin and serum lactate.
Dose: according to individual requirements, 1.5-3.0 g dextrose/kg body weight/day or up to 0.5 g dextrose/kg body weight/hour.

- *Dextrose Intravenous Fluid 5%, 10%, 20%, 25%, 50%.*

MINERALES

FERROUS GLUCONATE

Indications: iron-deficiency anemia
Cautions: interactions with iron salts
Dose: ferrous iron, therapeutic, 100-200mg daily in divided
doses; Prophylactic, 60mg daily;
Child up to 1 year, therapeutic, daily in divided doses, 36mg 1-5 years, 72mg.
6-12 years, 120mg.

- *Ferrous Gluconate 300mg Tablets It Contains 35mg Elemental Iron/Tablet*

FERROUS SULFATE

Indications: nutritional iron-deficiency anemia
Side Effects: temporary discoloration of teeth or dentures (can be minimized by thorough brushing).
Dose therapeutic, 375mg (75mg elemental iron) daily in divided doses.
Preventive, 40-75mg (8-15mg elemental iron) daily in water or in juice.

- *Kdiron Drops (15mg Elemental Iron/0.6ml)*
- *Kdiron Syrup (30mg Elemental Iron/5ml)*
- *Fefol Spansules (47mg Elemental Iron With 500mcg folic Acid/Spansule)*

FOLIC ACID

Indications: megaloblastic anemia due to folic acid deficiency; pregnancy vitamin supplement.
Cautions: should never be given alone in the treatment of Addisonian pernicious anemia and other vitamin B12 deficiency states because it may precipitate the onset of subacute degeneration of the spinal cord. Do not use in malignant disease unless megaloblastic anemia due to folate deficiency is an important complication (some malignant tumours are folate- dependent).
Dose: initially, 15mg daily for 4 months or until a haematopoietic response has been obtained. Maintenance, 5mg every 1-7 days, depending on underlying disease. Child up to 1 year, 500 mcg/kg daily. Child over 1 year, same as adult dose.

- *Folic Acid 5mg Tablets*

IRON-SORBITOL

Indications: iron-deficiency anemia
Cautions: 24 hours should elapse between iron administered orally and start of therapy with iron sorbitol injection. When another injectable iron preparation has been used, a week should elapse between the last injection and the start of therapy with iron sorbitol.
Contra-indications: liver disease, kidney disease (particularly pyelonephritis), untreated urinary tract infections, cardiac abnormalities like angina or arrhythmia.
Dose: by deep IM injection, adults and children over 3 kg, 1.5mg iron/kg to a max. of 100mg iron, repeated daily or, in patients with low tolerance to IM iron injection, on alternate days.

- *Jectofer 5% (50mg/ml) Injection. It Contains Of Iron.*

PHOSPHATE

Indications: Oral phosphate supplements may be required in addition to vitamin D in a small minority of patients with hypophosphataemic vitamin D-resistant rickets.
Side Effects: Diarrhoea is a common

Dose: vitamin D-resistant hypophosphataemic osteomalacia, 4–6 tablets daily; CHILD under 5 years 2–3 tablets daily

MAGNESIUM OXIDE

Indications: an oral supplements of Magnesium for bone mineralization, in muscle contractions and nerve impulses.
Dose: 250mg Once daily with meal.

- *Magnesium oxide caplets 250mg*

SODIUM CHLORIDE

Indications: treatment and deficiency of Sodium Chloride.
Cautions: Crohn's disease, diverticulitis, fluid retention hypertension,
Contra-indications: hypersensitivity
Dose: deficiency, Adult***:*** 4-8 tablets daily in divided doses. Severe salt loss***:*** upto 20 tablets per day. Muscle cramps during heamodialsis 10-16 tables

- *Slow Sodium Tables 600mg*

LIPIDS

Indications: coverage of caloric and essential fatty acid requirements in parenteral nutrition as in postoperative catabolism malabsorption, maldigestion, consuming disease, renal insufficiency and during convalescence.
Cautions: the emulsion should be perfectly homogenous
Contra-indications: disturbances in fat metabolism, hyperlipidaemia and fasting lipaemia, pregnancy, shock conditions, advanced liver insufficiency, cerebral affections, disturbances in blood coagulation; cardiac infarction, pulmonary high pressure, acute and life threatening situations like sepsis, acute embolism, hepatic and diabetic coma.
Dose: by IV infusion, 1-2 g of fat/kg body weight/day. Drop rate, start with 15-20 drops/minute and eventually increase to max. 45 drops/minute after 10-15 minutes

- *Intralipid 20% - 100 & 500ml*

MULTIVITAMINS

Indications: deficiency states; neurological disorders influenced by B-complex vitamin deficiency.

- *Megavit Drops (Multivitamin)*
- *Mixavit Tablets (Multivitamin)*
- *Multivitamin Tab (Minerals & Trace elemental Iron)*
- *Mixavit Syrup (Multivitamin)*
- *Neurobion Injection (Vitamin B_1 Vitamin B_6, Vitamin B_{12})*

PHYTOMENADIONE (Vitamin K1))

Indications: Vitamin-K deficiency in neonates; haemorrhage associated with over-dosage of anti-coagulants; hypoprothrombinemia due to anti-coagulants without haemorrhage.

Cautions: IV injection should be given very slowly.

Dose: neonate, by IM injection, 1mg.

Alternatively, by mouth, 2 doses of the colloidal (mixed micelle MM) preparation 2mg should be given in the first week. For breast-fed babies a third dose of 2mg is given at 1 month of age. The third dose is omitted in formula-fed babies because formula feeds contain vitamin K.

Haemorrhage due to anti-coagulant overdosage, 2.5mg to 20mg by slow IV injection.

- *Konakion MM Injection 10mg/ml For IV Injection Only.*
- *Konakion MM Paediatric Injection 2mg/0.2ml For IM, IV*
- *Konakion Tablets 10mg*

PYRIDOXINE HYDROCHLORIDE (Vitamin B_6))

Indications: Pyridoxine deficiency, including inadequate diet, drug-induced causes (e.g. isoniazid, hydralazine, oral contraceptives) or inborn errors of metabolism; Idiopathic sideroblastic anaemia; parenteral use is indicated when oral therapy is not feasible.

Dose: neuritis and deficiency states, 20-50mg up to 3 times daily. Isoniazid neuropathy prophylaxis, 10mg daily. Idiopathic sideroblastic anaemia, 100-400mg daily in divided doses.

- *Vitamin B_6 Tablets 50mg*

THIAMINE HYDROCHLORIDE (Vitamin B_1))

Indications: thiamine deficiency
Cautions: Anaphylactic shock may occasionally follow injection; breast feeding.
Dose: by mouth or by IM injection, 10-100mg daily, up to 600mg daily in acute deficiency

- *Vitamin B_1 Tablets 100mg*

HYPERCALCAEMIA AND HYPERCALCIURIA

CINACALCET

Indications: for the treatment of secondary hyperparathyroidism in dialysis patients with end-stage renal disease. For primary hyperparathyroidism in patients where parathyroidectomy is inappropriate,. Treatment of hypercalcaemia in parathyroid carcinoma. Cinacalcet reduces parathyroid hormone which leads to a decrease in serum calcium concentrations.
Cautions: treatment should not be initiated in patients with hypocalcaemia dose adjustment may be necessary if smoking started or stopped during treatment caution in moderate to severe impairment—monitor closely especially when increasing dose
Note: All patients receiving pharmacological doses of vitamin D should have their plasma-calcium concentration checked at intervals (initially once or twice weekly) and whenever nausea or vomiting occur
Side Effects: nausea, vomiting, anorexia; dizziness, paraesthesia, asthenia; reduced testosterone concentrations; myalgia; rash
Dose: Secondary hyperparathyroidism in patients with end-stage renal disease on dialysis, ADULT over 18 years, initially 30 mg once daily, adjusted every 2–4 weeks to max. 180 mg daily. Hypercalcaemia of primary hyperparathyroidism or parathyroid carcinoma, ADULT over 18 years, initially 30 mg twice daily, adjusted every 2–4 weeks according to response up to max. 90 mg 4 times daily

- *Mimpara Tablets 30 mg*

PHOSPHATE BINDING AGENT

SEVELAMER

Indications: hyperphosphataemia in patients on haemodialysis or peritoneal dialysis
Cautions: gastro-intestinal disorders
Contra-indications: bowel obstruction
Side Effects: nausea, vomiting, abdominal pain, constipation, diarrhoea, dyspepsia, flatulence; very rarely intestinal obstruction; *also reported* intestinal perforation, ileus, diverticulitis, pruritus, rash
Dose: ADULT over 18 years, initially 2.4–4.8 g daily in 3 divided doses with meals, adjusted according to serum-phosphate concentration (usual dose range 2.4–12 g daily in 3 divided doses)

- *Renagel Tablets, sevelamer hydrochloride 800 mg*

ELECTROLYTES

CALCIUM SALTS

Indications: calcium deficiency; hyperphosphataemia; cardiac resuscitation
Cautions: renal impairment; sarcoidosis; history of nephrolithiasis; avoid calcium chloride in respiratory acidosis or respiratory failure;
Contra-indications: conditions associated with hypercalcaemia and hypercalciuria (e.g. some forms of malignant disease)
Side Effects: gastro-intestinal disturbances; bradycardia, arrhythmias; *with injection*, peripheral vasodilatation, fall in blood pressure, injection-site reactions
Dose according to the requirements of the patient.
By slow intravenous injection, acute hypocalcaemia, calcium gluconate 1–2 g (Ca^{2+} 2.25–4.5 mmol);
CHILD obtain paediatric advice

- *Calcium chloride 75mg/ml Injection (as calcium chloride dihydrate 10%) (calcium 27.3mg* or *Ca^{2+} 80 micromol/ml).)*
- *Calcium gluconate 10% Injection (calcium 8.9mg* or *Ca^{2+} 220 micromol/ml)*
- *Calcium carbonate Chewable tablets, 1.5 g (calcium 600mg* or *Ca^{2+} 15 mmol*

POTASSIUM SALTS

Indications: potassium depletion as in diarrhoea; patients on digoxin and antiarrhythmic drugs; conditions in which secondary hyperaldosteronism occurs like nephrotic syndrome and liver cirrhosis; hypokalaemia.
Cautions: intestinal stricture, hiatus hernia (for sustained release tablets). For IV infusion, the concentration should not exceed 3.2 g (43 mmole) /liter; the solution must not be injected undiluted.
Contra-indications: renal failure, plasma potassium concentration above 5 mmole/ litre. Rapid injection may be toxic to heart.
Side Effects: nausea and vomiting (severe symptoms may indicate obstruction), oesophageal or small bowel ulcers.
Dose: by mouth, prophylactic administration, 25-50 mmole of K+ daily for established potassium depletion, 135-200 mmole daily may be needed.
By parenteral route, the max. dosage is 20 mmole potassium per hour. It is recommended not to exceed 2-3 mmole potassium per kg bodyweight in 24 hours.
The injectable solution should be diluted as additive to large
volume intravenous infusion i.e. 10ml diluted with not less than 500ml of a suitable diluent such as NaCl 0.9% fluid.

- *Slow-K Tablets 600mg (8 mmole Of K^+ & Cl^- /Tab)*
- *Potassium Chloride Syrup (5 mmole K^+ & Cl^- /5ml)*
- *Potassium Chloride Injection 10% (2 mmole Of K^+ & Cl^- /1ml)*

SODIUM BICARBONATE

Indications: chronic acidotic conditions; for severe metabolic acidosis use the IV route; emergency treatment of hyperkalemia.
Contra-indications: respiratory and metabolic alkalosis, hypoventilation, hyper-natraemia and in all situations where supply of sodium is contraindicated like cardiac insufficiency, oedema, hypertension and eclampsia.

Dose: by mouth, 4.8 g daily (57 mmole of Na^+ and HCO_3).
By IV route; the quantity of sodium bicarbonate injection to be infused is determined by the blood gas values and is calculated according to the following formula*:*
ml of 8.4% sodium bicarbonate injection = negative base excess x kg body weight x 0.3
Correction of metabolic acidosis should be effected too rapidly It is advisable to start administering only half of the calculated dose and make a continuation of the therapy conditional on further blood gas analysis. Drop rate, approximately 40 drops/minute = 120ml/hour.

- *Sodium Bicarbonate Injection 8.4% - 20ml (1 mmole of $NaHCO_3^-$/1ml)*
- *Sodium bicarbonate 8.4% Minijet).*
- *Sodium Bicarbonate (slow) 500mg Cap..*
- *Sodium Bicarbonate 600mg Tab.*

SODIUM CHLORIDE

Indications: electrolyte imbalance, plasma isotonic fluid replacement, sodium and chloride depletion, hypochloremic alkalosis, vehicle solution for supplementary medication, externally for wound irrigation and moistening of wound dressings.
The hypertonic sodium chloride solution is used for reversal of refractory hypovolaemic shock.
Cautions: restrict intake in impaired renal function, cardiac failure, hypertension, peripheral and pulmonary oedema, toxemia of pregnancy.
Contra-indications: hyperhydration, hypernatremia, hypokalaemia, acidotic situations, hypertension.
Dose: By IV infusion, average dose, 1000ml/day
Drop rate, 120-180 drops/minute corresponding to 360-540ml/hour.
By mouth, prophylaxis of sodium chloride deficiency, 2.4-4.8 g (40-80 mmole) daily with water.
Chronic renal salt wasting, up to 12 g daily with appropriate fluid intake.
Oral rehydration therapy (ORS)
(with glucose and potassium chloride)

- *Sodium Chloride 300mg Tablets*
- *0.9% Sodium Chloride (Normal Saline))*
- *0.45% Sodium Chloride (Half Normal Saline))*

- *3% Sodium Chloride (Hypertonic Sodium Chloride Solution))*
- *0.45% Sodium Chloride & 5% Dextrose (Half Normal Saline With Dextrose)*

SODIUM LACTATE

Indications: replacement of extra cellular fluid loss (isotonic dehydration), salt depletion, light metabolic acidosis, electrolyte substitution in burns.
Contra-indications: hypertonic and hypotonic dehydration,
hyper hydration, oedema, alkalosis, hypokalemia, hypernatremia, hyperlactatemia, renal insufficiency, hypertension.
Dose: by IV infusion, average dose 2000ml/day.
Drop rate, 120-180 drops/minute corresponding to 360-540ml/hour.

- *Compound Sodium Lactate Injection;*
- *Hartmann's Solution*
- *Ringer Lactate Solution*

It provides 131 mmole of Na^+ /liter, 5 mmole of K^+ /liter, 2 mmole of Ca/liter, 111 mmole of Cl /liter and 29 mmole of bicarbonate (as lactate)/liter

BLOOD PRODUCTS AND PLASMA EXPANDERS

ALBUMIN (Human Albumin solution)

Indications: concentrated solutions are used for substitution therapy in hypo proteinemia, particularly hypo albuminaemia associated with low plasma volume and as an adjunct in the treatment of hyperbilirubinaemia by exchange transfusion in the newborn. Isotonic solutions may be used in acute or sub acute loss of plasma volume and in plasma exchange.
Cautions: hypervolaemia, acute cardiac insufficiency, pulmonary edema, renal insufficiency, known intolerance to proteins; increased cardiovascular overload; conditions where capillary integrity is affected. Correct dehydration when using concentrated solutions.

- *Human Albumin 20% Solution 50ml & 100ml*

DEXTRAN 40%

Indications: conditions associated with peripheral local slowing of the blood flow; To expand and maintain blood volume in conditions like shock, burns, fat embolism; peripheral and cerebral circulatory disturbances; prophylaxis of post surgical thromboembolic disease.
Cautions: the compatibility of any additive to this solution should be checked before use. Special care is to be taken in case of a combined dextran therapy with conventional anti-coagulants because of the risk of bleeding.
Contra-indications: Cardiac decompensation, pulmonary oedema, cerebral haemorrhage, renal failure, haemorrhagic diseases, extra cellular fluid deficit, hypersensitivity to dextran.
Side Effects: anaphylactoid reactions may develop after administration of colloid volume replacement fluids. Normally these reactions manifest themselves on the skin, but in exceptional cases, more serious situations may develop ranging from flush to a sudden fall in blood pressure and possibly even to an immediate circulatory standstill.
Dose: by IV infusion, according to indication, up to 500ml/ infusion.
Max. dose for adults, 2 g dextran /kg body weight/day.
Drop rate, 40-80 drops/minute or 120-240ml/hour
Child, up to 15ml/kg body weight/day.

- *Dextran 40 Intravenous Infusion In 0.9% Sodium Chloride Intravenous Infusion.*

DARBEPOETIN ALFA

Indications: Anaemia associated with chronic renal failure; Anaemia in adults with non-myeloid malignancies receiving chemotherapy.
Cautions: poorly treated or inadequately controlled blood pressure; sickle cell disease; exclude other causes of anaemia; ischemic vascular disease; thrombocytosis; epilepsy; malignant disease; chronic liver failure; pregnancy; breast feeding.
ContraIndications; pure red cell aplasia; uncontrolled hypertension; patients unable to receive

thromboprophylaxis; avoid injection containing benzyl alcohol in neonates.
Side Effects: dose dependent increase in blood pressure or aggravation of hypertension; in isolated patients with normal or controlled blood pressure, hypertensive crisis with encephalopathy like symptoms and generalized tonic clonic convulsions requiring urgent medical attention; headache; dose dependent increase in platelet count; influenza like symptoms; thromboembolic events; peripheral oedema; injection site pain; isolated reports of pure red cell aplasia. antagonism of hypotensive effect and increased risk of hyperkalaemia when given with ACE inhibitors or angiotensin-II receptor antagonists.
Dose Anaemia associated with chronic renal failure in patients on dialysis***:*** ADULT and CHILD over 11 years, by subcutaneous or intravenous injection, initially 450 nanograms/kg once weekly, adjusted according to response by approx. 25% of initial dose at intervals of at least 4 weeks; maintenance dose (when haemoglobin concentration of 11 g/100ml achieved), given once weekly or once every 2 weeks.
Anaemia associated with chronic renal failure in patients not on dialysis***:*** ADULT and CHILD over 11 years, by subcutaneous or intravenous injection, initially 450 nanograms/kg once weekly or by subcutaneous injection, initially 750 nanograms/kg once every 2 weeks; adjusted according to response by approx. 25% of initial dose at intervals of at least 4 weeks; maintenance dose (when haemoglobin concentration of at least 11 g/100ml achieved), given once weekly or once every 2 weeks or once every month.
Note: Reduce dose by 25–50% if haemoglobin rise exceeds 2.5 g/100ml per month; suspend if haemoglobin exceeds 14 g/100ml until it falls below 13 g/100ml and then restart with dose at 25% below previous dose. When changing route give same dose then adjust according to weekly or fortnightly haemoglobin measurements. Adjust doses at 2-week intervals during maintenance treatment.
Anaemia in adults with non-myeloid malignancies receiving chemotherapy***:*** by subcutaneous injection, initially 6.75 mcg/kg once every 3 weeks (if response inadequate after 9 weeks further treatment may not be effective) or 2.25 mcg/kg once weekly (if appropriate rise

in haemoglobin not achieved after 4 weeks, double initial dose; if response remains inadequate after 4 weeks at higher dose further treatment may not be effective); haemoglobin should not exceed 13 g/100ml; if adequate response obtained or if rise in haemoglobin greater than 2 g/100ml in 4 weeks, reduce dose by 25–50%; continue for approx. 4 weeks after chemotherapy

- *Aranesp 10 mcg/0.4ml, 20 mcg/0.5ml, 60mcg/0.3ml, 300mcg/0.6ml Prefilled Syringe*

ERYTHROPOIETIN (EPOETIN ALPHA & BETA)

(Recombinant human erythropoietins)
Indications: correction of anemia associated with end-stage renal disease in patients maintained on haemodialysis; anemia in adults receiving platinum-containing cancer chemotherapy.
Cautions: same as Darbepoetin alpha
ContraIndications same as Darbepoetin alpha
Side Effects: same as Darbepoetin alpha
Dose: in hemodialysis patients, initially by IV injection, 50 units/kg three times per week increased by 25 u/kg at intervals of 4 weeks according to response.
Max. dose, 200 u/kg three times a week
If hemoglobin level increased at a rate exceeding 2 g/dL/month at 50 u/kg three times a week, a reduction of the dose is done by omitting one of the weekly doses.

- *Recombinate 30000 Unit Injection*

HUMAN PROTHRMBIN COMPLEX

Factor II, VII, IX, X, Protein C
Indications*:* for the therapy and prophylaxis of blood coagulating disorder caused by an acquired or hereditary deficiency of vitamin dependent factors II, VII, I and X
Contra-indications: Disseminated itrvascular coagulating or hyperfirinolsis, hypersensitivity
Side Effects: Circulating inhibitors, dyspnea, Nausea, vomiting, fever, hypersensitivity reactions, urticarial, hypotension, shock thromboembolic events
Pregnancy and Breast feeding: May be administered to only if clearly indicated and the benefit weights the risk.
Dose: The dosage and duration of the substitution therapy depend on the severity of disorder of the

haemostatic function, on the location and extent of the bleeding and on the clinical condition
Maintenance,

- *Prothromplex Total powder and solvent for solution for injection 600IU*

FACTOR IX

Dried factor IX fraction is prepared from human plasma by a suitable fractionation technique. It may also contain clotting factors II, VII and X.
Indications: congenital factor IX deficiency (haemophilia B).
Cautions: risk of thrombosis – principally with prior low purity products; liver disease.
Contra-indications: disseminated intravascular coagulation without prior treatment with heparin.
Side Effects: allergic reactions, including chills and fever.

- *Factor IX Complex 500 IU For IV Injection.*

CHELATORS AND ANTOGONISTS

DESFERRIOXAMINE MESILATE

(Deferoxamine Mesilate)
Indications: chronic iron overload; iron poisoning; aluminium overload in dialysis patients.
Cautions: renal impairment; eye and ear examinations before treatment and at 3-month intervals during treatment; monitor body-weight and height in children at 3-month intervals—risk of growth retardation with excessive doses; aluminium-related encephalopathy
Side Effects: hypotension (especially when given too rapidly by intravenous injection), disturbances of hearing and vision (including lens opacity and retinopathy); injection-site reactions, gastro-intestinal disturbances, asthma, fever, headache, arthralgia and myalgia; very rarely anaphylaxis, acute respiratory distress syndrome, neurological disturbances (including dizziness, neuropathy and paraesthesia), Yersinia and mucormycosis infections, rash, renal impairment, and blood dyscrasias

Dose: by slow SC infusion, by means of a portable pump, over a
period of 8-12 hours, 20-60mg/kg, 4-7 times a week depending on the degree of iron overload.
IM injections are less effective.
IV infusions of deferoxamine can be administered during blood transfusion.
Continuous IV infusion could be used in patients incapable of tolerating SC infusions or who have cardiac problem secondary to iron overload.
Pregnancy: Teratogenic in *animal* studies; use only if potential benefit outweighs risk.
Breast Feeding Manufacturer advises use only if potential benefit outweighs risk.

- *Desferal 500mg, Powder For Reconstitution*

DEFERASIROX

It acts by binding to iron and removes it from the blood stream
Indications iron overload caused by blood transfusions in adults and children at least 2 years old.
Cautions: Serum ferritin should be measured monthly to assess response to therapy and to evaluate for the possibility of over chelation of iron. If the serum ferritin falls consistently below 500 mcg/L, consideration should be given to temporarily interrupting therapy
Contra-indications: Known sensitivity or allergy; kidney or liver disease;
vision or hearing problems; or a weak immune system caused by disease (such as cancer, HIV)
Side effect: signs of an allergic reaction***:*** hives; difficulty breathing; swelling of your face, lips, tongue, or throat. Severe skin rash; problems with vision or hearing; urinating less than usual or not at all; easy bruising or bleeding, unusual weakness; fever, chills, body aches, flu symptoms; drowsiness, confusion, mood changes; swelling or numbness in your hands or feet; or nausea, stomach pain, loss of appetite, itching, dark urine, clay-colored stools, jaundice (yellowing of the skin or eyes). Less serious side effects may include***:*** mild stomach pain, diarrhea, nausea or vomiting; fever; mild skin rash; or headache, cough, sinus pain, runny or stuffy nose.

Dose: 20mg/kg body weight. It should be taken once daily on an empty stomach at least 30 minutes before food, preferably at the same time each day. Tablets should not be chewed or swallowed whole. It should not be taken with aluminum-containing antacid products.
Doses (mg/kg per day) should be calculated to the nearest whole tablet. Tablets should be completely dispersed by stirring in water, orange juice, or apple juice until a fine suspension is obtained. doses of < 1 g should be dispersed in 3.5 ounces of liquid and doses of ≥ 1 g in 7.0 ounces of liquid. After swallowing the suspension, any residue should be resuspended in a small volume of liquid and swallowed.

- *Exjade Tablet 125, 250, 500mg*

CHOLINERGIC, TOXICITY ANTIDOTES

PRALIDOXIME CHLORIDE

Indications: adjunct to atropine in the treatment of poisoning by organ phosphorus insecticide or nerve gases (e.g. tabun, sarin, soman)
Cautions: myasthenia gravis
Contra-indication: poisoning with carbamates or with organ phosphorus compounds without anticholinesterase activity.
Renal impairment : use with caution
Side Effects: drowsiness, dizziness, disturbances of vision, nausea, tachycardia, headache, hyperventilation, and muscular weakness.
Dose: By intravenous infusion: adult and child: initially 30 mg/kg over 20 minutes, followed by 8 mg/kg/hour; usual max. 12 g in 24 hours.
Note: The loading dose may be administered by intravenous injection (diluted to a concentration of 50 mg/ml with water for injections) over at least 5 minutes if pulmonary oedema is present or if it is not practical to administer an intravenous infusion; pralidoxime chloride doses in BNF may differ from those in product literature

- *Pralidoxime chloride Injection, powder for reconstitution, 1 g/ vial*

ORAL NUTRITION

FOODS FOR SPECIAL DIETS

SAPROPTERIN DIHYDROCHLORIDE

Indications: Phenylketonuria. Tetrahydrobiopterin deficiency

Cautions: monitor blood-phenylalanine concentration before and after first week of treatment—if unsatisfactory response increase dose at weekly intervals to max. dose and monitor blood-phenylalanine concentration weekly; discontinue treatment if unsatisfactory response after 1 month; monitor blood-phenylalanine and tyrosine concentrations 1–2 weeks after dose adjustment and during treatment; history of convulsions

Side Effects: diarrhoea, vomiting, abdominal pain, nasal congestion, cough, pharyngolaryngeal pain, headache; also reported hypersensitivity reactions

Dose: Phenylketonuria (specialist use only), by mouth, ADULT and CHILD over 4 years, initially 10 mg/kg once daily, preferably in the morning, adjusted according to response; usual dose 5–20 mg/kg daily.
Tetrahydrobiopterin deficiency (specialist use only), by mouth, ADULT and CHILD initially 2–5 mg/kg once daily, preferably in the morning, adjusted according to response; max. 20 mg/kg daily; total daily dose may alternatively be given in 2–3 divided doses.

- *Kuva sapropterin dihydrochloride 100 mg*

DRUGS USED IN METABOLIC DISORDERS

CARGLUMIC ACID

Indications: hyperammonaemia due to N-acetylglutamate synthase deficiency and organic acidaemia under specialist supervision

Side Effects: sweating; less commonly diarrhoea, vomiting, bradycardia, pyrexia

Dose: Hyperammonaemia due to N-acetylglutamate synthase deficiency, ADULT and CHILD initially 100–250 mg/kg daily in 2–4 divided doses immediately before food, adjusted according to plasma–ammonia

concentration; maintenance 10–100 mg/kg daily in 2–4 divided doses.
Hyperammonaemia due to organic acidaemia, ADULT and CHILD initially 100–250 mg/kg daily in 2–4 divided doses immediately before food, adjusted according to plasma-ammonia concentration

- *Carbaglu Dispersible tablets 200 mg*

10 - MUSCULOSKELETAL AND JOINT DISEASES

ANTI-INFLAMMATORY DRUGS (NSAIDS)

CELECOXIB

Indications: pain and inflammation in osteoarthritis, rheumatoid arthritis, and ankylosing spondylitis
Cautions: monitor blood pressure before and during treatment
Note: Discontinue if no improvement after 2 weeks on max. dose
Contra-indications: sulfonamide sensitivity; inflammatory bowel disease
Side Effects: dyspnea, influenza-like symptoms
Dose: Osteoarthritis, 200 mg daily in 1–2 divided doses, increased if necessary to max. 200 mg twice daily; CHILD not recommended.
Rheumatoid arthritis, 100 mg twice daily, increased if necessary to 200 mg twice daily; CHILD not recommended.
Ankylosing spondylitis, 200 mg daily in 1–2 divided doses, increased if necessary to max. 400 mg daily in 1–2 divided doses; CHILD not recommended

- *Celebrex 200 mg Capsules*

DICLOFENAC SODIUM

Indications: Pain and inflammation in rheumatic disease (including Still's disease) and other musculoskeletal disorders; acute gout; post-operative pain.
Cautions: breast-feeding**.**
Contra-indications: porphyria; Intravenous use. Additional contra-indications include concomitant NSAID or anticoagulant use (including low-dose heparin), history of haemorrhagic diathesis, history of confirmed or suspected cerebrovascular bleeding, operations with high risk of haemorrhage, history of asthma, moderate or severe renal impairment, hypovolaemia, dehydration
Side Effects: diarrhea, constipation, gas or bloating, headache**,** dizziness, ringing in the ears**,** unexplained weight gain**,** excessive tiredness, lack of energy**,** upset

stomach**,** loss of appetite, itching**,** pain in the upper right part of the stomach**,** yellowing of the skin or eyes, flu-like symptoms, fever, blisters, rash, hives, swelling of the eyes, face, tongue, lips, throat, arms, hands, feet, ankles, or lower legs, difficulty breathing or swallowing, hoarseness pale skin, fast heartbeat, cloudy, discolored, or bloody urine back pain**,** difficult or painful urination; suppositories may cause rectal irritation; injection site reactions

Dose: By mouth, 75–150mg daily in 2–3 divided doses
By deep intramuscular injection into the gluteal muscle, acute exacerbations of pain and postoperative pain, 75mg once daily (twice daily in severe cases) for max. of 2 days
Ureteric colic, 75mg then a further 75mg after 30 minutes if necessary.
By intravenous infusion (in hospital setting), 75mg repeated if necessary after 4–6 hours for max. 2 days.
Prevention of postoperative pain, initially after surgery 25–50mg over 15–60 minutes then 5mg/hour for max. 2 days.
By rectum in suppositories, 75–150mg daily in divided doses
Max. total daily dose by any route 150mg.
child 1–12 years, juvenile arthritis, by mouth or by rectum, 1–3mg/kg daily in divided doses (25mg e/c tablets, 12.5mg and 25mg suppositories only)
child 6–12 years, postoperative pain, by rectum, 1–2mg/kg daily in divided doses (12.5mg and 25mg suppositories only) for max. 4 days

- *Voltaren-R Tablets 100mg*
- *Votrex Injection 75mg/3ml*
- *Diclogesic Suppositories 12.5mg, 50mg & 100mg*

IBUPROFEN

It is a Non steroidal anti inflammatory drug.
Indications pain and inflammation in rheumatic disease (including juvenile arthritis) and other musculoskeletal disorders; mild to moderate pain including dysmenorrhoea; post-operative analgesia; migraine; fever and pain in children; post immunization pyrexia.
Cautions: Elderly; allergic disorders; renal, hepatic or cardiac impairment.

Contra-indications: Known hypersensitivity to aspirin and other Non steroidal anti inflammatory drugs pregnancy***:*** & breast feeding.
Side effect: Same as for other Non steroidal anti inflammatory drugs.
Dose: Adults***:*** 1.2 to 1.8 g daily divided in 3-4 doses preferably after food. Max. 2.4 g daily. Maintenance***:*** 0.6 -1.2g daily.
Juvenile rheumatoid arthritis – Child over 5kg body weight 30 – 40mg/kg daily in3-4 divided doses.
Fever and pain***:*** Child over 5kg body weight 20-30mg/kg daily in3-4 divided doses. OR
3 – 6 months (over 5 kg)***:*** 50mg 3 times daily.6 months to 1 year***:*** 50mg 3-4 times daily; 1-3 years***:*** 100mg 3 times daily; 4-6 years***:*** 150mg 3 times daily; 7-9 years***:*** 200mg 3 times daily; 10-12 years***:*** 300mg 3 times daily.

- *Ibuprofen 400mg Tablets*
- *Ibuprofen 600mg Sachets*
- *Ibuprofen 100mg/5ml suspension*
- *Ibuprofen 5mg/ml Injection*

INDOMETACIN

(Indomethacin)
Indications: pain and moderate to severe inflammation in rheumatic disease and other acute musculoskeletal disorders; acute gout; dysmenorrhoea; closure of ductus arteriosus.
Cautions: may impair the ability to drive or operate machinery; allergic disease, particularly asthma; hepatic and renal impairment, pregnancy, epilepsy, parkinsonism, psychiatric disturbances, elderly patients. During prolonged therapy ophthalmic and blood examinations are advisable. Avoid rectal administration in proctitis and haemorrhoids.
Contra-indications: peptic ulceration, salicylate hypersensitivity.
Side Effects: frequently gastro-intestinal disturbances (including diarrhoea), headache, dizziness, and light-headedness; gastro-intestinal ulceration and bleeding; rarely, drowsiness, confusion, insomnia, convulsions, psychiatric disturbances, depression, syncope, blood disorders (particularly thrombocytopenia), hypertension, hyperglycaemia, blurred vision, corneal deposits,

peripheral neuropathy, and intestinal strictures; suppositories may cause rectal irritation and occasional bleeding

Drug Interactions: Refer to table below.

Dose: by mouth, 50-200mg daily in divided doses with food. By rectum in suppositories, 100mg at night, repeated in the morning if required.

If rectal and oral treatments are to be combined, max. total daily dose 150-200mg.

- *Indocid Capsules 25mg;*
- *Indomin 100mg Suppositories*

NAPROXEN

Indications: pain and inflammation in rheumatic disease (including Still's disease) and other musculoskeletal disorders; acute gout; dysmenorrhoea.

Cautions: In patients with renal, cardiac, or hepatic impairment caution is required since NSAIDs may impair renal function

Contra-indications: patient with hypersensitivity to Aspirin or other NSAIDs, pregnancy**,** breast feeding and patients with coagulase defects, severe heart failure

Side Effects: Gastro-intestinal discomfort, nausea, diarrhoea, and occasionally bleeding and ulceration occur; hypersensitivity reactions (particularly rashes, angioedema, and bronchospasm; Renal failure may be provoked by NSAIDs especially in patients with renal impairment; Hepatic damage, alveolitis, pulmonary eosinophilia, pancreatitis, eye changes, Stevens-Johnson syndrome and toxic epidermal necrolysis are other rare side effects.

Dose: by mouth, 0.5-1 g daily in 2 divided doses; Child (over 5 years), Still's disease, 10mg/kg daily in 2 divided doses.

Acute musculoskeletal disorders and dysmenorrhoea, 500mg initially, then 250mg every 6-8 hours as required.

Acute gout, 750mg initially, then 250mg every 8 hours until attack has passed.

- *Nopain Tablets 250mg*
- *Naproxen 125mg/5ml syrup*

DRUG INTERACTIONS FOR ANALGESICS:

NSAIDs belongs to Analgesics and has the following interaction information:

ACE Inhibitors	Increased risk of renal impairment when NSAIDS given with ACE inhibitors, also hypotensive effect antagonised	
Adrenergic Neurone Blockers	NSAIDS antagonise hypotensive effect of adrenergic neurone blockers	
Alpha-blockers	NSAIDS antagonise hypotensive effect of alpha-blockers	
Angiotensin-II Receptor Antagonists	Increased risk of renal impairment when NSAIDS given with angiotensin-II receptor antagonists, also hypotensive effect antagonised	
Antidepressants, SSRI	Increased risk of bleeding when NSAIDS given with SSRIS	
Aspirin	Avoid concomitant use of NSAIDS with aspirin (increased side effects)	
Baclofen	NSAIDS possibly reduce excretion of baclofen (increased risk of toxicity)	
Beta-blockers	NSAIDS antagonise hypotensive effect of beta-blockers	Since systemic absorption may follow topical application of beta-blockers to the eye the possibility of interactions, in particular, with drugs such as verapamil should be borne in mind
Calcium-channel Blockers	NSAIDS antagonise hypotensive effect of calcium-channel blockers	Dihydropyridine calcium-channel blockers include amlodipine, felodipine, isradipine, lacidipine, lercanidipine, nicardipine, nifedipine, nimodipine, and nisoldipine

Cardiac Glycosides	NSAIDS possibly increase plasma concentration of cardiac glycosides, also possible exacerbation of heart failure and reduction of renal function	
Cyclosporine	Increased risk of nephrotoxicity when NSAIDS given with cyclosporine	
Clonidine	NSAIDS antagonise hypotensive effect of clonidine	
Clopidogrel	Increased risk of bleeding when NSAIDS given with clopidogrel	
Corticosteroids	Increased risk of gastro-intestinal bleeding and ulceration when NSAIDS given with corticosteroids	Interactions do not generally apply to corticosteroids used for topical action (including inhalation) unless specified
Coumarins	NSAIDS possibly enhance anticoagulant effect of coumarins	Change in patient's clinical condition, particularly associated with liver disease, intercurrent illness, or drug administration, necessitates more frequent testing. Major changes in diet (especially involving salads and vegetables) and in alcohol consumption may also affect anticoagulant control
Diazoxide	NSAIDS antagonise hypotensive effect of diazoxide	
Diuretics	Risk of nephrotoxicity of NSAIDS increased by diuretics, also antagonism of diuretic effect	
Diuretics Potassium-sparing and Aldosterone Antagonists	Possibly increased risk of hyperkalaemia when NSAIDS given with potassium-sparing diuretics and	

	aldosterone antagonists	
Drospirenone	Risk of hyperkalaemia when NSAIDS given with drospirenone (monitor serum potassium during first cycle)	
Erlotinib	Increased risk of bleeding when NSAIDS given with Erlotinib	
Heparins	Possible increased risk of bleeding when NSAIDS given with heparins	
Hydralazine	NSAIDS antagonise hypotensive effect of hydralazine	
Iloprost	Increased risk of bleeding when NSAIDS given with iloprost	
Ketorolac	Avoid concomitant use of NSAIDS with ketorolac (increased ***Side Effects:*** and haemorrhage)	
Lithium	NSAIDS probably reduce excretion of lithium (increased risk of toxicity)	
Methotrexate	NSAIDS probably reduce excretion of methotrexate (increased risk of toxicity)—but for concomitant use in rheumatic disease	
Methyldopa	NSAIDS antagonise hypotensive effect of methyldopa	
Mifepristone	Avoidance of NSAIDS advised by manufacturer of mifepristone	
Minoxidil	NSAIDS antagonise hypotensive effect of Minoxidil	

Moxonidine	NSAIDS antagonise hypotensive effect of Moxonidine	
Nitrates	NSAIDS antagonise hypotensive effect of nitrates	
Nitroprusside	NSAIDS antagonise hypotensive effect of Nitroprusside	
NSAIDs	Avoid concomitant use of NSAIDS with other NSAIDS (increased side effects)	Interactions do not generally apply to topical NSAIDs
Penicillamine	Possible increased risk of nephrotoxicity when NSAIDS given with Penicillamine	
Pentoxifylline (oxpentifylline)	Possible increased risk of bleeding when NSAIDS given with Pentoxifylline (oxpentifylline)	
Phenindione	NSAIDS possibly enhance anticoagulant effect of Phenindione	Change in patient's clinical condition particularly associated with liver disease, intercurrent illness, or drug administration, necessitates more frequent testing. Major changes in diet (especially involving salads and vegetables) and in alcohol consumption may also affect anticoagulant control
Phenytoin	NSAIDS possibly enhance effects of phenytoin	
Quinolones	Possible increased risk of convulsions when NSAIDS given with quinolones	
Ritonavir	Plasma concentration of NSAIDS possibly increased by ritonavir	
Sibutramine	Increased risk of bleeding when NSAIDS given with Sibutramine	
Sulphonylureas	NSAIDS possibly	

	enhance effects of Sulphonylureas	
Tacrolimus	Possible increased risk of nephrotoxicity when NSAIDS given with Tacrolimus	Interactions do not generally apply to Tacrolimus used topically; risk of facial flushing and skin irritation with alcohol consumption does not apply to Tacrolimus taken systemically
Venlafaxine	Increased risk of bleeding when NSAIDS given with venlafaxine	
Zidovudine	Increased risk of haematological toxicity when NSAIDS given with Zidovudine	Increased risk of toxicity with nephrotoxic and myelosuppressive drugs - for further details

DICLOFENAC BELONGS TO ANALGESICS AND HAS THE FOLLOWING INTERACTION INFORMATION:

Cyclosporine	plasma concentration of diclofenac increased by Cyclosporine (halve dose of diclofenac)	
Coumarins	diclofenac possibly enhances anticoagulant effect of coumarins**,** also increased risk of haemorrhage with intravenous diclofenac (avoid concomitant use)	Change in patient's clinical condition, particularly associated with liver disease, intercurrent illness, or drug administration, necessitates more frequent testing. Major changes in diet (especially involving salads and vegetables) and in alcohol consumption may also affect anticoagulant control
Heparins	increased risk of haemorrhage when intravenous diclofenac given with heparins (avoid concomitant use, including low-dose heparin)	
Lithium	Diclofenac reduces excretion of lithium (increased risk of toxicity)	
Methotrexate	Diclofenac reduces excretion of methotrexate	

	(increased risk of toxicity)—but for concomitant use in rheumatic disease see Methotrexate .	
Phenindione	Diclofenac enhances anticoagulant effect of phenindione, also increased risk of haemorrhage with intravenous diclofenac (avoid concomitant use)	Change in patient's clinical condition particularly associated with liver disease, intercurrent illness, or drug administration, necessitates more frequent testing. Major changes in diet (especially involving salads and vegetables) and in alcohol consumption may also affect anticoagulant control

DIFLUNISAL BELONGS TO ANALGESICS AND HAS THE FOLLOWING INTERACTION INFORMATION:

Antacids	absorption of diflunisal reduced by antacids	Antacids should preferably not be taken at the same time as other drugs since they may impair absorption
Coumarins	diflunisal possibly enhances anticoagulant effect of coumarins	Change in patient's clinical condition, particularly associated with liver disease, intercurrent illness, or drug administration, necessitates more frequent testing. Major changes in diet (especially involving salads and vegetables) and in alcohol consumption may also affect anticoagulant control

ETODOLAC BELONGS TO ANALGESICS AND HAS THE FOLLOWING INTERACTION INFORMATION:

Coumarins	etodolac possibly enhances anticoagulant effect of coumarins	Change in patient's clinical condition, particularly associated with liver disease, intercurrent illness, or drug administration, necessitates more frequent testing. Major changes in diet (especially involving salads and vegetables) and in alcohol consumption may also affect anticoagulant control

STEROIDAL DRUGS

TRIAMCINOLONE ACETONIDE

Indications: local inflammation of joints and tissues
Cautions: active infection in or near joints; pregnancy; children under 6 years; patients with myasthenia gravis,

infection, diabetes and other conditions where corticosteroid therapy should be avoided or contra-indicated.
Dose: by intra-articular injection, 2.5-40mg according to joint size, to a max. of 80mg in multiple injections.
By deep IM injection, 40mg into the upper and outer quadrant of the gluteal muscle.

- *Adcortyl Intra-Articular/Intradermal Injection (Aqueous Suspension) 10mg/ml*
- *Kenalog Intra-Articular/Intramuscular Injection (Aqueous Suspension) 40mg/ml*

DRUGS SUPPRESSIG THE RHEUMATIC DISEASE PROCESS

ANAKINRA

Indications: inhibits the activity of interleukin-1. Anakinra (in combination with methotrexate) is for the treatment of rheumatoid arthritis which has not responded to methotrexate alone; it is not, however, recommended for routine management of rheumatoid arthritis.
Cautions: predisposition to infection; history of asthma
Contra-indications: neutropenia, renal impairment caution if eGFR 30–50 ml/minute/1.73 m^2; avoid if eGFR less than 30 ml/minute/1.73 m^2,
Pregnancy & ***Breast-feeding:*** avoid
Side Effects: injection-site reactions; headache; infections, neutropenia (see also cautions), and antibody formation; also reported malignancy
Dose: By subcutaneous injection, ADULT over 18 years, 100 mg once daily

- *Anakinra Injection 100 mg prefilled syringe*

CHLOROQUINE

Indications: active rheumatoid arthritis, systemic lupus erythematosus; malaria.
Cautions: renal and hepatic impairment, pregnancy, porphyria, psoriasis, glucose-6-phosphate dehydorgenase deficiency; elderly patients, children; regular ophthalmic examinations required.
Contra-indications: pre-existing maculoretinopathy; concurrent therapy with hepatotoxic drugs.

Side Effects: gastro-intestinal disturbances, headache, visual disturbances, irreversible retinal damage, corneal opacities, depigmentation or loss of hair, skin reactions that could be severe to mandate discontinuation of treatment; can rarely lead to deafness; neuromyopathy, sensitization and blood disorders such as thrombocytopenia.
Dose: administered on expert advice, chloroquine (base) 150mg daily after food.
Max. 2.5mg/kg daily. Child, 3mg/kg daily
Note: 200mg of chloroquine sulfate
= 250mg chloroquine phosphate
= 150mg chloroquine.

- *Nivaquine tablets 200mg*

CICLOSPORIN

Cyclosporine
Indications: severe active rheumatoid arthritis when conventional second-line therapy inappropriate or ineffective; graft-versus-host disease; atopic dermatitis and psoriasis.
Cautions: serum creatinine level should be monitored especially if dose increased or concomitant NSAIDs introduced or increased
Contra-indications: in abnormal renal function, uncontrolled hypertension, uncontrolled infections, and malignancy. Measure serum creatinine at least twice before treatment and monitor every 2 weeks for first 3 months, then every 4 weeks (or more frequently if dose increased or concomitant NSAIDs introduced or increased; reduce dose if serum creatinine increases more than 30% above baseline in more than 1 measurement; if above 50%, reduce dose by 50% (even if within normal range) and discontinue if reduction not successful within 1 month; monitor blood pressure (discontinue if hypertension develops that cannot be controlled by antihypertensive therapy); monitor hepatic function if concomitant NSAIDs given.
Side Effects: tremors**,** Overgrowth of the gums**,** Unusual bleeding or bruising**,** Chills**,** Yellowing of the skin or eyes**,** Seizures**,** Decreased urination**,** Swelling (feet, ankles, lower legs, and hands)**,** Weight gain**,** headache
Drug Interactions: Several potential drug interactions.

Dose: by mouth, initially 2.5mg/kg daily in 2 divided doses, if necessary increased gradually after 6 weeks. Max. 4mg/kg daily. Discontinue if response is insufficient after 3 months.child and under 18 years, not recommended

- *Neoral Capsules 25, 50, 100mg;*
- *Neoral Oral Solution 100mg/ml*

HYDROXYCHLOROQUINE SULPHATE

Indications: active rheumatoid arthritis (including Still's disease), systemic and discoid lupus erythematosus.
Cautions: hepatic impairment, renal impairment, regular ophthalmological examinations are recommended; pregnancy, breast-feeding; neurological disorders; psoriasis; porphyria
Contra-indications: psoriatic arthritis; concurrent use of hepatotoxic drugs.
Side Effects: gastro-intestinal disturbances, headache, and skin reactions; ECG changes, convulsions and visual changes; blood disorders, mental changes, myopathy; Stevens-Johnson Syndrome
Dose: administered on expert advice, initially 400mg daily in divided doses.
Maintenance, 200-400mg daily; max. 6.5mg/kg daily (but not exceeding 400mg daily).
Child, up to 6.5mg/kg daily (dosage form not suitable for children under 3 years of age).

- *Plaquanil Tablets 200mg*

LEFLUNOMIDE

Indications: moderate to severe active rheumatoid arthritis; active psoriatic arthritis
Cautions: impaired bone-marrow function including anaemia, leucopenia or thrombocytopenia recent treatment with other hepatotoxic or myelotoxic disease-modifying antirheumatic drugs; washout procedures recommended for serious adverse effects or before switching to other disease-modifying antirheumatic drugs history of tuberculosis; exclude pregnancy before treatment; effective contraception essential during treatment and for at least 2 years after treatment in women and at least 3 months after treatment in men

Contra-indications: severe immunodeficiency; severe hypoproteinaemia; serious infection
Side Effects: diarrhoea, nausea, vomiting, anorexia, oral mucosal disorders, abdominal pain; increased blood pressure; headache, dizziness, asthenia, paraesthesia; leucopenia; tenosynovitis; alopecia, rash, dry skin, pruritus
Dose: Rheumatoid arthritis, ADULT over 18 years, initially 100 mg once daily for 3 days, then 10–20 mg once daily
Psoriatic arthritis, ADULT over 18 years, initially 100 mg once daily for 3 days, then 20 mg once daily

- *Arava Tablets leflunomide 20 mg*

PENICILLAMINE

Indications: severe active or progressive rheumatoid arthritis, Still's disease; Wilson's disease; copper and lead poisoning.
Cautions: patients should be warned not to expect improvement for at least 6 to 12 weeks after initiation of treatment. Blood counts, including platelets, and urine examinations should be carried out every 1 or 2 weeks for the first 2 months then every 4 weeks to detect blood disorders and proteinuria. A reduction in platelet count indicates that treatment must be stopped and later re-introduced at a lower dosage level and then increased gradually, if possible; renal impairment; pregnancy and portal hypertension; avoid concurrent gold, chloroquine, hydroxychloroquine or immunosuppressive treatment.
Contra-indications: lupus erythematosus; moderate to severe renal impairment
Side Effects: hypersensitivity reactions (may necessitate discontinuation of treatment), nausea, anorexia, taste loss, mouth ulcers, muscle weakness, skin reactions, oedema, proteinuria, agranulocytosis or severe thrombocytopenia which could be fatal; rarely myasthenia gravis, febrile reactions, lupus erythematosus.
Dose: rheumatoid arthritis, administered on expert advice, adults initial dose of 125-250mg daily before food for 1 month increased by this amount every 4 to 12 weeks until remission occurs.
Usual maintenance dose, 500-750mg daily but up to 1.5 g may rarely be given.

If remission has been sustained for 6 months, reduction of dosage by 125-250mg every 12 weeks may be attempted.
Child, initial dose, 50mg daily before food for 1 month, increased at 4 weeks intervals to a maintenance dose of 15-20mg/kg daily.
Toxic metal poisoning (lead and copper), 1-2 g daily in divided doses before food until urinary lead is stabilized at less than 500mcg/day.
Child 20mg/kg daily.

- *Distamine 125mg Tablets*

SODIUM AUROTHIOMALATE

Indications: severe active or progressive rheumatoid arthritis; palindromic rheumatism, juvenile chronic arthritis (Still's disease).
Cautions: patients should report any untoward symptoms (fever, buccal ulceration, purpura, epistaxis, bleeding gums, menorrhagia diarrhoea, metallic taste, sore throat, malaise, bruising). cautions in renal and hepatic impairment, elderly patients, eczema, colitis breast-feeding; treatment with drugs which can cause blood disorders; annual chest x-ray recommended.
Contra-indications: severe renal and hepatic disease; history of blood disorders or bone marrow aplasia, exfoliative dermatitis, systemic lupus erythematosus, necrotizing enterocolitis, pulmonary fibrosis; pregnancy; porphyria.
Side Effects: Severe reactions, which could be fatal, mouth ulcers skin reactions, oedema, proteinuria, blood disorders; rarely colitis peripheral neuritis, pulmonary fibrosis, hepatotoxicity with cholestatic jaundice.
Dose: administered on expert advice, adults, dose must be given by deep IM. injection and the area gently massaged. It is usual to begin treatment with test dose of 10mg followed by doses of 50mg at weekly intervals until remission occurs or a total of 1 g has been given.
Benefit is not to be expected until about 8 doses (300-500mg) have been given. The interval between injections is then gradually increased to 2 and then to 4 weeks but intervals of 6 weeks may be suitable in some patients and treatment is continued for 5 years after complete remission. If relapse occurs, dosage may be immediately increased to 50mg weekly and then reduced if control is obtained. It is

important to avoid complete relapse since second courses of gold are not usually effective. Child, 1mg/kg weekly to a max. of 50mg weekly, the interval being gradually increased to 4 weeks according to response; an initial test dose is given which is equivalent to 1/10-1/5 of the calculated dose.

- *Myocrisin Injection 10mg*

BOTULINUM TOXIN TYPE A

Indications: focal spasticity, including arm symptoms in conjunction with physiotherapy, dynamic equinus foot deformity caused by spasticity in ambulant paediatric cerebral palsy patients over 2 years, and hand and wrist disability associated with stroke; blepharospasm; hemifacial spasm; spasmodic torticollis; severe hyperhidrosis of axillae

Cautions: history of dysphagia; pregnancy; breast-feeding;

Special cautions for blepharospasm or hemifacial spasm.

Cautions: if risk of angle-closure glaucoma; reduced blinking can lead to corneal exposure, persistent epithelial defect and corneal ulceration (especially in those with VII nerve disorders) careful testing of corneal sensation in previously operated eyes, avoidance of injection in lower lid area to avoid ectropion, and vigorous treatment of epithelial defect needed

Contra-indications: generalised disorders of muscle activity (e.g. myasthenia gravis)

Side Effects: increased electrophysiologic jitter in some distant muscles; misplaced injections may paralyse nearby muscle groups and excessive doses may paralyse distant muscles; influenza-like symptoms; rarely arrhythmias, myocardial infarction, seizures, hypersensitivity reactions including rash, pruritus and anaphylaxis, antibody formation (substantial deterioration in response), and injection-site reactions

Specific side effects: for blepharospasm or hemifacial spasm***:*** Ptosis; keratitis, lagophthalmos, dry eye, irritation, photophobia, lacrimation; facial oedema; less commonly facial weakness (including drooping), dizziness, tiredness, ectropion, entropion, diplopia, visual disturbances; rarely eyelid bruising and swelling (minimised by applying gentle pressure at injection site

immediately after injection); very rarely angle-closure glaucoma, corneal ulceration
Special side effects in paediatric cerebral palsy*:* Drowsiness, paraesthesia, urinary incontinence, myalgia
Special side effects in torticollis*:* Dysphagia and pooling of saliva (occurs most frequently after injection into sternomastoid muscle), nausea, dry mouth, rhinitis, drowsiness, headache, dizziness, hypertonia, stiffness; less commonly dyspnea, voice alteration, diplopia, and ptosis; rarely respiratory difficulties (associated with high doses); CSM has warned of persistent dysphagia and sequelae (including death)—important
Special side effects in axillary hyperhidrosis*:* Non-axillary sweating, hot flushes; less commonly myalgia and joint pain
Specific side effects: in focal upper-limb spasticity associated with stroke Dysphagia; hypertonia; less commonly arthralgia and bursitis
Dose: specific to each individual preparation

- *Botox 100 IU/ml IM Inj.*

ETANERCEPT

Indications: severe, active and progressive rheumatoid arthritis in patients not previously treated with methotrexate; psoriasis
Cautions: predisposition to infection; significant exposure to herpes zoster virus—interrupt treatment and consider varicella–zoster immunoglobulin; heart failure (risk of exacerbation); demyelinating CNS disorders (risk of exacerbation); history of blood disorders; Tuberculosis
Contra-indications: pregnancy; breast-feeding; active infection
Side Effects: vomiting, oesophagitis, cholecystitis, pancreatitis, gastro-intestinal haemorrhage, myocardial or cerebral ischaemia, venous thromboembolism, hypotension, hypertension, dyspnea, demyelinating disorders, seizures, bone fracture, renal impairment, polymyositis, bursitis, lymphadenopathy
Dose: By subcutaneous injection, rheumatoid arthritis, adult over 18 years, 25mg twice weekly or 50mg once weekly
Psoriatic arthritis, ankylosing spondylitis, adult over 18 years, 25mg twice weekly

Polyarticular-course juvenile idiopathic arthritis, child and adolescent 4–17 years, 400 mcg/kg twice weekly (max. 25mg twice weekly)
Psoriasis, adult over 18 years, initially 25–50mg twice weekly for up to 12 weeks then reduce to 25mg twice weekly; max. treatment duration 24 weeks; discontinue if no response after 12 weeks

- *Enbrel 25mg & 50mg Inj.*
- *Enbrel 50mg Injectable Pen.*

INFLIXIMAB

Indications: severe, active and progressive rheumatoid arthritis in patients not previously treated with methotrexate; psoriasis; inflammatory bowel disease.
Cautions: hepatic impairment; renal impairment; monitor for infections before, during, and for 6 months after treatment; heart failure (discontinue if symptoms develop or worsen; avoid in moderate or severe heart failure); demyelinating CNS disorders (risk of exacerbation); Hypersensitivity reactions
Contra-indications: pregnancy; breast-feeding; severe infections
Side Effects: dyspepsia, diarrhoea, constipation, hepatitis, cholecystitis, diverticulitis, gastro-intestinal haemorrhage, flushing, bradycardia, arrhythmias, palpitation, syncope, vasospasm, peripheral ischaemia, ecchymosis, haematoma, interstitial pneumonitis or fibrosis, fatigue, anxiety, drowsiness, dizziness, insomnia, confusion, agitation, amnesia, seizures, demyelinating disorders, vaginitis, myalgia, arthralgia, endophthalmitis, rash, sweating, hyperkeratosis, skin pigmentation, alopecia
Dose: By intravenous infusion, rheumatoid arthritis (in combination with methotrexate), adult over 18 years, 3mg/kg, repeated 2 weeks and 6 weeks after initial infusion, then every 8 weeks; discontinue if no response by 12 weeks of initial infusion
Ankylosing spondylitis, adult over 18 years, 5mg/kg, repeated 2 weeks and 6 weeks after initial infusion, then every 6–8 weeks; discontinue if no response by 6 weeks of initial infusion

Psoriatic arthritis (in combination with methotrexate), adult over 18 years, 5mg/kg, repeated 2 weeks and 6 weeks after initial infusion, then every 8 weeks
Psoriasis, adult over 18 years, 5mg/kg, repeated 2 weeks and 6 weeks after initial infusion, then every 8 weeks; discontinue if no response by 14 weeks of initial infusion

- *Remicade 100mg Injection*

CYTOKINE MODULATORS

are monoclonal antibodies which inhibit the pro-inflammatory cytokine, tumour necrosis factor alpha.

CERTOLIZUMAB PEGOL

Indications: with moderate to severe active rheumatoid arthritis when response to disease-modifying antirheumatic drugs (including methotrexate) has been inadequate can be used in combination with methotrexate, or as a monotherapy if methotrexate is not tolerated or is contra-indicated. also licensed for : the treatment of severe active *ankylosing spondylitis* in patients who have had an inadequate response to, or are intolerant of NSAIDs. It is also licensed for the treatment of severe active axial spondyloarthritis, without radiographic evidence of ankylosing spondylitis but with objective signs of inflammation, in patients who have had an inadequate response to, or are intolerant of NSAIDs
Cautions: predisposition to infection: monitor for infection before, during, and for 5 months after treatment. Do not initiate until active infections are controlled: discontinue if new serious infection develops until infection controlled. hepatitis B virus: monitor for active infection. Mild heart failure (discontinue if symptoms develop or worsen (avoid in moderate to severe heart failure). demyelinating CNS disorders (risk of exacerbation). History or development of malignancy; Tuberculosis Patients should be evaluated for tuberculosis before treatment. Active tuberculosis should be treated with standard treatment for at least 2 months before starting certolizumab pegol. Patients who have previously received adequate treatment for tuberculosis can start certolizumab pegol but should be monitored every 3 months for possible recurrence. In patients without active

tuberculosis but who were previously not treated adequately, chemoprophylaxis should ideally be completed before starting certolizumab pegol. In patients at high risk of tuberculosis who cannot be assessed by tuberculin skin test, chemoprophylaxis can be given concurrently with certolizumab pegol. Patients should be advised to seek medical attention if symptoms suggestive of tuberculosis (e.g. persistent cough, weight loss, and fever) develop

Blood disorders Patients should be advised to seek medical attention if symptoms suggestive of blood disorders (such as fever, sore throat, bruising, or bleeding) develop

***Contra-indications**:* severe active infection

Pregnancy: avoid (manufacturer advises adequate contraception during treatment and for at least 5 months after last dose)

Breast-feeding; manufacturer advises use only if potential benefit outweighs risk (no information available).

***Side Effects**:* hypertension, sensory abnormalities, rash; *less commonly* ascites, cholestasis, gastro-intestinal disorders (including perforation and ulcer), hepatic disorders, appetite disorders, cardiomyopathies (including heart failure), dyslipidaemia, syncope, oedema, dizziness, ischaemic coronary artery disorders, arrhythmias, asthma, pleural effusion, cough, peripheral neuropathy, tremor, anxiety, mood disorders, influenza-like illness, menstrual disorders, renal impairment, haematuria, malignancy (including solid tumours, lymphoma, and leukaemia), skin cancer, benign tumours, haemorrhage, electrolyte disorders, muscle disorders, visual disturbance, ocular inflammation, tinnitus, ecchymosis, impaired healing, alopecia, photosensitivity, acne, skin discoloration, nail disorders, new onset or worsening psoriasis, dermatitis; *rarely* cholelithiasis, splenomegaly, atrioventricular block, cerebrovascular accident, Raynaud's phenomenon, interstitial lung disease, impaired coordination, trigeminal neuralgia, seizures, thyroid disorders, sexual dysfunction, nephropathy. *also reported* multiple sclerosis

Dose: By subcutaneous injection, rheumatoid arthritis, ADULT over 18 years: 400 mg, repeated 2 weeks and 4 weeks after initial injection, then 200 mg every 2 weeks

(review treatment if no response within 12 weeks) Severe ankylosing spondylitis: severe axial spondyloarthritis, ADULT over 18 years: 400 mg, repeated 2 weeks and 4 weeks after initial injection, then 200 mg every 2 weeks *or* 400 mg every 4 weeks. review treatment if no response within 12 weeks

- *Cimzia Injection, 200-mg prefilled syringe*

TOCILIZUMAB

Indications: Tocilizumab is licensed for use in patients with moderate to severe active rheumatoid arthritis when response to at least one disease-modifying antirheumatic drug or tumour necrosis factor inhibitor has been inadequate, or in those who are intolerant of these drugs. Tocilizumab can be used in juvenile idiopathic arthritis.
Cautions: predisposition to infection or history of recurrent or chronic infection; interrupt treatment if serious infection occurs; history of intestinal ulceration or diverticulitis; monitor hepatic transaminases every 4–8 weeks for first 6 months, then every 12 weeks; monitor neutrophil and platelet counts 4–8 weeks after starting treatment and then as indicated; low platelet or absolute neutrophil count (discontinue if absolute neutrophil count less than 0.5×10^9/litre or platelet count less than 50×10^3/microlitre); monitor lipid profile 4–8 weeks after starting treatment and then as indicated; monitor for demyelinating disorders tuberculosis: Patients should be evaluated for tuberculosis before treatment. Patients with latent tuberculosis should be treated with standard therapy before starting tocilizumab
Contra-indications: severe active infection, do not initiate if absolute neutrophil count less than 2×10^9/litre.
Hepatic impairment manufacturer advises caution.
Renal impairment manufacturer advises monitor renal function closely in moderate or severe impairment
Pregnancy manufacturer advises avoid unless essential (toxicity in animal studies); effective contraception required during and for 3 months after treatment
Breast-feeding manufacturer advises use only if potential benefit outweighs risk —no information available
Side Effects: abdominal pain, mouth ulceration, gastritis, raised hepatic transaminases; dizziness, peripheral oedema, hypertension, hypercholesterolaemia; headache;

infection (including upper respiratory-tract infection); antibody formation, hypersensitivity, leucopenia, neutropenia; rash, pruritus.
less commonly: gastric ulcer, gastro-intestinal perforation, hypertriglyceridaemia, hypothyroidism, nephrolithiasis, infusion related reactions, anaphylaxis, and thrombocytopenia also reported.
Dose: Rheumatoid arthritis, by intravenous infusion: adult over 18 years, 8 mg/kg (max. 800 mg) once every 4 weeks; for details of dose adjustment in patients with liver enzyme abnormalities, or low absolute neutrophil or platelet count,

- *RoActemra Concentrate for intravenous infusion, tocilizumab 20 mg/ml, 10 ml (200-mg) vial, 20 ml (400-mg) vial*

DRUGS USED IN THE TREATMENT OF GOUT

ALLOPURINOL

Indications: gout prophylaxis, hyperuricaemia
Cautions: administer prophylactic colchicine or NSAID (not aspirin or salicylate) until at least 1 month after hyperuricaemia corrected; ensure adequate fluid intake (2 liters/day); render urine alkaline if uric acid overload is high; caution in hepatic disease; reduce dose in renal impairment (in renal failure adjustment of dosage is necessary during dialysis). In neoplastic conditions, treatment with allopurinol (if required) should be commenced before cytotoxic drugs are given; pregnancy and breast-feeding
Contra-indications: not a treatment for acute gout; if patient is receiving allopurinol when attack occurs continue as normal and treat attack separately.
Side Effects: rashes, fever (withdraw therapy). If the rash is mild the drug can be re-introduced with caution and discontinued immediately if rash recur; malaise, vertigo, headache, symptomless xanthine deposits in muscle, alopecia, hepatotoxicity.
Drug Interactions: Anticoagulants—Allopurinol may increase the chance of bleeding; Azathioprine or Mercaptopurine Allopurinol may cause higher blood levels of azathioprine or mercaptopurine.

Dose: initially, 100mg daily as a single dose, after meals gradually increased over 1-3 weeks according to the plasma or urinary uric acid concentration, to about 300mg daily.
Usual maintenance dose, 200-600mg, rarely 900mg daily, divided into doses of not more than 300mg.
Child, (in neoplastic conditions, enzyme disorders), 10-20mg/kg daily.
Breast feeding: Allopurinol passes into the breast milk

- *Zyloric 100 & 300mg Tablets*

BENZBROMARONE

Indications: is a uricosuric drug that reduces plasma concentrations of uric acid by blocking renal tubular reabsorption. It has been suggested that benzbromarone may also increase the intestinal elimination of uric acid. It has been used to treat hyperuricaemia including that associated with chronic gout
***Cautions:*.** administer prophylactic colchicine or NSAID (not aspirin or salicylate)
Contra-indications: not used to treat acute attacks of gout
Side Effects: rashes, fever (withdraw therapy). If the rash is mild the drug can be re-introduced with caution and discontinued immediately if rash recur; malaise, vertigo, headache, symptomless xanthine deposits in muscle, alopecia, hepatotoxicity.
Dose: 50 to 200 mg daily.
An NSAID or colchicine should be given initially to reduce the risk of precipitating acute gout. An adequate fluid intake should be maintained.
Lower doses of benzbromarone (20 mg) have also been used in the form of a combination product with allopurinol.

- *Benzbromarone Tablets100mg*

COLCHICINE

Indications: acute gout; short-term prophylaxis during initial therapy with allopurinol and uricosuric drugs; prophylaxis of familial Mediterranean fever (recurrent polyserositis)

Cautions: elderly; gastro-intestinal disease; cardiac disease
Contra-indications: blood disorders, pregnancy (teratogenicity)
Side Effects: nausea, vomiting, and abdominal pain; excessive doses may cause profuse diarrhoea, gastro-intestinal haemorrhage, rash, renal and hepatic damage dry mouth, nausea, gastro-intestinal disturbance, altered liver enzymes, hypotension, drowsiness, fatigue, dizziness
Dose: Acute gout, 500 micrograms 2–4 times daily until symptoms relieved, max. 6 mg per course; course not to be repeated within 3 days Prevention of gout attacks during initial treatment with allopurinol or uricosuric drugs, 500 micrograms twice daily. Prophylaxis of familial Mediterranean fever [unlicensed], 0.5–2 mg once daily

- *Colchicine, 500 micrograms Tablets*

HYPERURICAEMIA ASSOCIATED WITH CYTOTOXIC DRUGS

RASBURICASE

is for the prophylaxis and treatment of acute hyperuricaemia, before and during initiation of chemotherapy, in patients with haematological malignancy and a high tumour burden at risk of rapid lysis.
Indications: prophylaxis and treatment of acute hyperuricaemia with initial chemotherapy for haematological malignancy
Cautions: monitor closely for hypersensitivity; atopic allergies; may interfere with test for uric acid—
Contra-indications: G6PD deficiency,
Pregnancy: & Breast-feeding: Avoid
Side Effects: fever; less commonly nausea, vomiting, diarrhoea, headache, hypersensitivity reactions (including rash, bronchospasm and anaphylaxis); haemolytic anaemia, methaemoglobinaemia
Dose: By intravenous infusion, 200 micrograms/kg once daily for up to 7 days according to plasma-uric acid concentration

- *Fasturtec Intravenous infusion, powder for reconstitution, 1.5-mg vial (with solvent*

DRUGS USED IN NEUROMUSCULAR DISORDRS

DANTROLENE

Indications: chronic severe spasticity of voluntary muscle; malignant hyperthermia
Cautions: impaired cardiac and pulmonary function; therapeutic effect may take a few weeks to develop—discontinue if no response within 6–8 weeks
Note: Drowsiness may affect performance of skilled tasks (e.g. driving); effects of alcohol enhanced
Contra-indications: acute muscle spasm; avoid when spasticity is useful, for example, locomotion
Side Effects: Hepatotoxicity. Potentially life-threatening hepatotoxicity reported, usually if doses greater than 400 mg daily used, in females, patients over 30 years, if history of liver disorders, or concomitant use of hepatotoxic drugs; test liver function before and at intervals during therapy—discontinue if abnormal liver function tests or symptoms of liver disorder diarrhoea (withdraw if severe, discontinue treatment if recurs on re-introduction), nausea, vomiting, anorexia abdominal pain; pericarditis; pleural effusion, respiratory depression; headache, drowsiness, dizziness, asthenia, fatigue, seizures, fever, chills; speech and visual disturbances
Dose: Initially 25 mg daily, may be increased at weekly intervals to max. 100 mg 4 times daily; usual dose 75 mg 3 times daily

- *Dantrium 25 mg Capsules*

BACLOFEN

This is a skeletal muscle relaxant.
Indications: chronic severe spasticity resulting from disorders such as multiple sclerosis or traumatic partial section of spinal cord
Cautions: psychiatric illness, Parkinson's disease, cerebrovascular disease, elderly; respiratory impairment; epilepsy; history of peptic ulcer (avoid oral route in active peptic ulceration); diabetes; hypertonic bladder sphincter; avoid abrupt withdrawal (risk of hyperactive state, may

exacerbate spasticity, and precipitate autonomic dysfunction including hyperthermia, psychiatric reactions and convulsions)

Contra-indications: Specific contra-indications for intrathecal treatment local or systemic infection

Renal impairment: risk of toxicity—use smaller doses (e.g. 5 mg daily by mouth) and if necessary increase dosage interval; if eGFR less than 15 ml/minute/1.73m^2 manufacturer advises use by mouth only if potential benefit outweighs risk; excreted by kidney.

Pregnancy: manufacturer advises use only if potential benefit outweighs risk (toxicity in animal studies)

Breast-feeding: present in milk—amount probably too small to be harmful

Side Effects: gastro-intestinal disturbances, dry mouth; hypotension, respiratory or cardiovascular depression; sedation, drowsiness, confusion, dizziness, ataxia, hallucinations, nightmares, headache, euphoria, insomnia, depression, anxiety, agitation, tremor; seizure; urinary disturbances; myalgia; visual disorders; rash, hyperhidrosis; *rarely* taste disturbances, abdominal pain, changes in hepatic function, paraesthesia, erectile dysfunction, dysarthria; very rarely hypothermia

Dose: By mouth, ADULT over 18 years, initially 5 mg 3 times daily, gradually increased; usual maintenance dose up to 60 mg daily in divided doses (max. 100 mg daily); CHILD under 18 years, initially 300 micrograms/kg daily in 4 divided doses, increased gradually at weekly intervals until satisfactory response; usual maintenance dose 0.75–2 mg/kg daily in divided doses; CHILD up to 8 years, max. total daily dose 40 mg/day; CHILD 8–18 years, max. total daily dose 60 mg/day

Note : Review treatment if no benefit within 6 weeks of achieving max. dose

By intrathecal injection, specialist use only, severe chronic spasticity unresponsive to oral antispastic drugs (or where side effects; of oral therapy unacceptable) or as alternative to ablative neurosurgical procedures, ADULT over 18 years, initial test dose 25–50 micrograms over at least 1 minute via catheter or lumbar puncture, increased in 25-microgram steps (not more often than every 24 hours) to max. 100 micrograms to determine appropriate dose, then dose-titration phase, most often using infusion

pump (implanted into chest wall or abdominal wall tissues) to establish maintenance dose (ranging from 12 micrograms to 2 mg daily for spasticity of spinal origin or 22 micrograms to 1.4 mg daily for spasticity of cerebral origin) retaining some spasticity to avoid sensation of paralysis; CHILD 4–18 years (spasticity of cerebral or spinal origin only), initial test dose 25–50 micrograms then titrated as for ADULT, initial maintenance dose 25–200 micrograms daily, adjusted according to response

- *Lioresal Tablets 10mg*

PYRIDOSTIGMINE BROMIDE

This is an anticholinesterase drug.
Indications myasthenia gravis
Cautions: weaker muscarinic action, asthma, bradycardia, recent myocardial infarction epilepsy, hypotension, parkinsonism, peptic ulcer, renal impairment; pregnancy and breast-feeding.
Contra-indications: intestinal or urinary obstruction.
Side Effects: nausea, vomiting, increased salivation, abdominal cramps, bronchial secretions, sweating, weakness, hypotension and agitation.
Dose: by mouth, 30-120mg at suitable intervals throughout the day. Total daily dose, 0.3-1.2 g
Neonates, 5-10mg every 4 hours, 1/2-1 hour before feed.
Child up to 6 years, 30mg initially.
6-12 years, initially 60mg.
Usual total daily dose 30-360mg.

- *Mestinon Tablets 60mg*

QUININE

Indications: nocturnal leg cramps; malaria
Cautions: atrial fibrillation, conduction defects, heart block, pregnancy (not in malaria); monitor blood glucose levels during parenteral administration; G6PD deficiency.
Contra-indications: haemoglobinuria; optic neuritis.
Side Effects: cinchonism, including tinnitus, headache, hot and flushed skin, nausea, abdominal pain, rashes, visual disturbances, temporary blindness, confusion; hypersensitivity reactions including angioedema and blood disorders

Dose: quinine (anhydrous base) 100mg =quinine bisulfate 169mg = quinine dihydrochloride 122mg = quinine hydrochloride 122mg = quinine sulfate 121mg.
Leg cramps***:*** as salts, 200-300mg at bed time.

- *Quinine Sulfate Tablets 300mg*

TIZANIDINE

Indications: spasticity associated with multiple sclerosis or spinal cord injury or disease
Cautions: elderly; monitor liver function monthly for first 4 months and in those who develop unexplained nausea, anorexia or fatigue; concomitant administration of drugs that prolong QT interval; avoid abrupt withdrawal (risk of rebound hypertension and tachycardia
Contra-indications: pregnancy, breast feeding
Side Effects: dry mouth, nausea, gastro-intestinal disturbance, altered liver enzymes, hypotension, drowsiness, fatigue, dizziness
Dose: ADULT over 18 years, initially 2 mg daily as a single dose increased according to response at intervals of at least 3–4 days in steps of 2 mg daily (and given in divided doses) usually up to 24 mg daily in 3–4 divided doses; max. 36 mg daily

- *Tizanidine 4mgTablets, (as hydrochloride)*

ENZYMES

HYALURONIDASE

This is an enzyme used to render the tissues more easily permeable to injected fluids as in SC infusions.
Indications: enhance permeation of SC or IM injections, local anesthetics and SC infusions; promote resorption of excess fluids and blood.
Cautions: infants and elderly
Contra-indications: do not apply direct to cornea; sites of infection or malignancy; swelling sites of bites or stings; not for IV use.
Side Effects: occasional severe allergy.
Dose: With subcutaneous or intramuscular injection, 1500 units dissolved directly in solution to be injected (ensure compatibility)

With local anaesthetics, 1500 units mixed with local anaesthetic solution (ophthalmology, 15 units/ml)
Hypodermoclysis, 1500 units dissolved in 1ml water for injections or 0.9% sodium chloride injection, administered before start of 500–1000ml infusion fluid;
Extravasation or haematoma, 1500 units dissolved in 1ml water for injections or 0.9% sodium chloride injection, infiltrated into affected area (as soon as possible after extravasation)

- *Hyalase Injection 1500 Units*

11 - EYE

ANTI-INFECTIVE DRUGS

ACYCLOVIR

Indications: local treatment of herpes simplex infections
Side Effects: local irritation and inflammation reported; very rarely hypersensitivity reactions including angioedema.
Dose: Apply 5 times daily (continue for at least 3 days after complete healing)

- *Zovirax Eye Ointment 3%*

GANCICLOVIR

Indications: life-threatening or sight-threatening cytomegalovirus infections in immunocompromised patients only; prevention of cytomegalovirus disease during immunosuppressive therapy following organ transplantation; local treatment of CMV retinitis
Cautions: close monitoring of full blood count (severe deterioration may require correction and possibly treatment interruption); history of cytopenia; potential carcinogen and teratogen; radiotherapy; ensure adequate hydration during intravenous administration; vesicant—infuse into vein with adequate flow preferably using plastic cannula; children (possible risk of long-term carcinogenic or reproductive toxicity);
Contra-indications: hypersensitivity to valganciclovir, ganciclovir, acyclovir, or valaciclovir; abnormally low hemoglobin, neutrophil, or platelet counts
Renal impairment: reduce dose if eGFR less than 70 ml/minute/1.73 m^2.
Hepatic Impairment: No dosage adjustment provided in manufacturer's labeling. However, dosage adjustment unlikely due to low systemic absorption
Pregnancy avoid—teratogenic risk; ensure effective contraception during treatment and barrier contraception for men during and for at least 90 days after treatment
Breast-feeding avoid—no information available
Side Effects: diarrhoea, nausea, vomiting, dyspepsia, abdominal pain, constipation, flatulence, dysphagia, taste

disturbance, hepatic dysfunction; dyspnea, chest pain, cough; headache, insomnia, convulsions, dizziness, peripheral neuropathy, depression, anxiety, confusion, abnormal thinking, fatigue, weight loss, anorexia; infection, pyrexia, night sweats; anemia, leucopenia, thrombocytopenia, pancytopenia, renal impairment; myalgia, arthralgia; macular oedema, retinal detachment, vitreous floaters, eye pain; ear pain; dermatitis, pruritus; injection-site reactions; less commonly mouth ulcers, pancreatitis, arrhythmias, hypotension, anaphylactic reactions, psychosis,
tremor, male infertility, hematuria, disturbances in hearing and vision, and alopecia Sepsis
Dose: By intravenous infusion initially (induction) 5 mg/kg every 12 hours for 14–21 days for treatment or for 7–14 days for prevention.
maintenance (for patients at risk of relapse of retinitis): 6 mg/kg daily on 5 days per week *or* 5 mg/kg daily until adequate recovery of immunity (if retinitis progresses initial induction treatment may be repeated)

- *Cymevene Intravenous infusion, powder for reconstitution, 500-mg*

CHLORAMPHENICOL

Indications: It has broad spectrum of activity and is the drug of choice for superficial eye infections.
Contra-indications: history of hypersensitivity to chloramphenicol, myelosuppression during previous exposure to chloramphenicol and in patients with a family history of blood dyscrasias including aplastic anaemia.
Side Effects: transient stinging
Dose: apply eye drops or eye ointment every 3 hours.

- *Phenicol Eye Drops 0.5%;*
- *Phenicol Eye Ointment 1%*

FUSIDIC ACID

Contains 1% w/w fusidic acid anhydrous (as the hemihydrate).
Indications: bacterial infections of the eye caused by susceptible organisms.

Cautions: Prolonged use of an anti-infective may result in the development of super infection due to organisms, including fungi, resistant to that anti-infective
Contra-indications: hypersensitivity; Use when contact lenses are worn.
Side Effects: None Known
Dose: one drop is applied in the conjunctival sac every 12th hour. Treatment should be continued for two days after the eye appears normal.On the first day of the treatment, may be applied more frequently e.g. every 4th hour.
Surgical prophylaxis, one drop every 12th hour 24-48 hours before operation.

- *Fucithalmic 1 % Viscous Eye Drops*

GENTAMICIN

Indications: infection of the eye caused by susceptible bacteria and Pseudomonas aeruginosa.
Dose: Apply 1 drop at least every 2 hours then reduce frequency as infection is controlled and continue for 48 hours after healing.
Eye ointment
Apply either at night (if eye drops used during the day) or 3–4 times daily (if eye ointment used alone).

- *Gentacin Eye Ointment 0.3%*

OXYTETRACYCLINE HCL

Indications: conjunctivitis, blepharitis, keratitis.
Dose: apply 2-4 times daily.

- *Terramycin Eye Ointment I %*

POLYMYXIN B SULFATE

Indications: ocular bacterial infections; prophylactic use before and after surgery or removal of foreign bodies.
Side Effects: local irritation and dermatitis
Dose: 1 -2 drops two to four times daily.

- *Neosporin Eye Drops. (With Gramicidin & Neomycin);*
- *Neomixin Eye Drops (With Neomycin)*

CORTICOSTEROIDS AND ANTI-INFLAMMATIORY PREPARATIONS

ANTAZOLINE SULPHATE

Indications: allergic conjunctivitis
Cautions: should not be used for prolonged periods, such usage may lead to rebound symptoms on withdrawal of treatment.
Contra-indications: glaucoma.
Dose: apply 2-3 times daily.

- *Antistine - Privine Eye Drops (With Naphazoline)*

DEXAMETHASONE

Indications: local treatment of inflammation.
Cautions: aggravation of dendritic corneal ulceration; glaucoma may be produced. Not to be used for a long period except when its use is indicated.
Contra-indications: ocular herpes simplex and fungal infections; tuberculous lesions of the eye.
Dose: instill one or two drops into the conjunctival sac every hour during the day and when convenient every two hours during the night as initial therapy. After favorable response reduce to 3-4 times daily as it may be sufficient.

- *Decadron Eye Drops*
- *Maxitrol Eye Drops (With Neomycin 0.35% & Polymyxin B 6000 Units/ml)*
- *Sofradex Eye Drops (With Framycetin 0.5% & Gramicidin 0.005%)*

FLUOROMETHOLONE

Indications: acute and chronic conjunctivitis and keratitis of an allergic nature; inflammations of the anterior uvea (iritis, iridocyclitis), scleritis, episcleritis and myositis. Post-operative conditions after strabismus, cataract and glaucoma operations.
Contra-indications: herpes cornea, superficialis, mycosis of the cornea, and conjunctiva, tuberculous affections and ulcerous processes of the cornea.
Dose: 1 or 2 drops 2-3 times daily in the conjunctival sac. During the first 24-48 hours the dosage can be increased to 1-2 drops hourly.

- *Efemoline Eye Drops (With Tetrahydrozoline 0.25 mg/1ml*

PREDNISOLONE

Indications: allergic conjunctivitis, corneal conjunctivitis, inflammation of the eye, uvetis and keratitis.
Contra-indications: injuries and ulcerations of the cornea including especially infections of viral and bacterial origin.
Side Effects: 'steroid glaucoma' may follow the use of corticosteroid eye reparations in susceptible individuals;
-a 'steroid cataract' may follow prolonged use.
-Other side effects: include thinning of the cornea and sclera.
Dose: Apply every 1–2 hours until controlled then reduce frequency apply a little eye ointment or instill 1-2 drops in the conjunctival sac several times daily.

- *Ultracortenol Eye Drops 0.5%*
- *Ultracortenol Eye Ointment 0.5%*

SODIUM CROMOGLICATE

Indications: allergic conjunctivitis; seasonal keratoconjunctivitis
Side Effects: burning and stinging
Dose: ADULT and CHILD 1 -2 drops 4 times daily.
Pregnancy: hypersensitivity to benzalkonium chloride; should be used with caution during the first trimester of pregnancy

- *Opticrom Eye Drops*
- *Cusicrom 2*
- *Dadcrom 2 %*

MYDRIATICS AND CYCLOPLEGICS

ATROPINE SULFATE

Indications: mydriatic and cycloplegic; it is used mainly for the treatment of iridocyclitis to prevent posterior synechiae preferably with phenylephrine 10% eye drops.
Cautions: mydriasis may precipitate acute closed-angle (congestive) glaucoma in a few patients over 60 years of age.

Contra-indications: narrow-angle glaucoma.
Dose: 1 or more drops as required; The ointment is to be applied as necessary. It has 7 days of duration of action; Homatropine is preferred to atropine since it has a shorter duration of 24 hours.

- *Atropine Eye Drops 1%*

CYCLOPENTOLATE HYDROCHLORIDE

Indications: cycloplegia for refraction in young children.
Cautions: - raised intra-ocular pressure.
-Patients should be warned not to drive for 1–2 hours after mydriasis
-Toxic systemic reactions to and cyclopentolate may occur in the very young and the very old
Side Effects: transient stinging and raised intra-ocular pressure; on prolonged administration, local irritation, hyperaemia, oedema and conjunctivitis may occur.
Dose: Apply once and the action lasts for up to 24 hours.

- *Cyclopentolate HCl 0.5% Minims*

PHENYLEPHRINE HYDROCHLORIDE

Indications: mydriatic to dilate pupil without causing cycloplegic effect.
Cautions: as for atropine.
Contra-indications: patients with narrow angle between iris and cornea.
Dose: one drop as required.

- *Phenylephrine 2.5% & 10% Minims*

TROPICAMIDE

Indications: mydriatic and cycloplegic with rapid recovery; preoperative pupillary dilation (cataract operations)
Cautions: not to drive for 1–2 hours after mydriasis
Contra-indications: narrow-angle glaucoma
Side Effects: Ocular side effects of mydriatics and cycloplegics include transient stinging and raised intra-ocular pressure; on prolonged administration, local irritation, hyperaemia, oedema and conjunctivitis may occur. Contact dermatitis (conjunctivitis) is not uncommon with the antimuscarinic mydriatic drugs, especially atropine

Dose: for simple mydriasis, 1-2 drops; for pre-retioscopic cycloplegia, 4-6 drops, at intervals of 5 minutes in the eye being examined. It has a duration of action of 3 hours.

- *Mydriacyl 1%Eye Drops*
- *Tropicamide 1%Minims*

TREATMENT OF GLAUCOMA

ACETAZOLAMIDE

Indications: adjunct in glaucoma, reduction of intra-ocular pressure in open-angle glaucoma, secondary glaucoma, and peri-operatively in angle-closure glaucoma
Cautions: not generally recommended for prolonged use but if given monitor blood count and plasma electrolyte concentration; pulmonary obstruction (risk of acidosis); elderly; pregnancy**,** avoid extravasation at injection site (risk of necrosis);
Contra-indications: hypokalaemia, hyponatraemia, hyperchloraemic acidosis; severe hepatic impairment; renal impairment, sulphonamide hypersensitivity
Side Effects: nausea, vomiting, diarrhoea, taste disturbance; loss of appetite, paraesthesia, flushing, headache, dizziness, fatigue, irritability, depression; thirst, polyuria; reduced libido; metabolic acidosis and electrolyte disturbances on long-term therapy; occasionally, drowsiness, confusion, hearing disturbances, urticaria, malaena, glycosuria, haematuria, abnormal liver function, renal calculi, blood disorders including agranulocytosis and thrombocytopenia, rashes including Stevens-Johnson syndrome and toxic epidermal necrolysis; rarely, photosensitivity, liver damage, flaccid paralysis, convulsions; transient myopia reported
Dose: by mouth or by IV injection, initially 500 mg, subsequent doses 250 mg every 6 hours.

- *Diamox Tablets 250 mg*
- *Diamox Injection 500 mg Per Vial*

PILOCARPINE NITRATE

Indications: chronic non-congestive glaucoma and to reverse mydriasis.

Cautions: A darkly pigmented iris may require higher concentration of the miotic or more frequent administration and care should be taken to avoid overdosage. Retinal detachment has occurred in susceptible individuals and those with retinal disease; therefore fundus examination is advised before starting treatment with a miotic. Care is also required in conjunctival or corneal damage. Intra-ocular pressure and visual fields should be monitored in those with chronic simple glaucoma and those receiving long-term treatment with a miotic. Miotics should be used with caution in cardiac disease, hypertension, asthma, peptic ulceration, urinary-tract obstruction, and Parkinson's disease. Blurred vision may affect performance of skilled tasks (e.g. driving) particularly at night or in reduced lighting.
Contra-indications: conditions where pupillary constriction is undesirable such as acute iritis, anterior uveitis and some forms of secondary glaucoma. They should be avoided in acute inflammatory disease of the anterior segment.
Side Effects: Ciliary spasm leads to headache and browache which may be more severe in the initial 2–4 weeks of treatment (a particular disadvantage in patients under 40 years of age). Ocular Side effects include burning, itching, smarting, blurred vision, conjunctival vascular congestion, myopia, lens changes with chronic use, vitreous haemorrhage, and pupillary block
Dose: glaucoma, 1 drop 3-6 times daily; miosis, 1 drop of 1% solution.

- *Pilocarpine Eye Drops 2% & 4%*

TIMOLOL MALEATE

Indications: chronic simple glaucoma.
Cautions: caution is necessary in patients with asthma, bradycardia or heart failure.
Side Effects: ocular stinging, burning, pain, itching, erythema, dry eyes and allergic reactions including anaphylaxis and blepharoconjunctivitis; occasionally corneal disorders have been reported.
Drug Interactions: Since systemic absorption may follow topical application the possibility of interactions, in particular, with drugs such as verapamil should be borne in mind

Dose: 1 drop twice daily.

- *Timoptol Eye Drops 0.5%*

DORZOLAMIDE + TIMOLOL

Indications: raised intra-ocular pressure in ocular hypertension, open-angle glaucoma, pseudo-exfoliative glaucoma adjunct to beta-blocker

Cautions: hepatic impairment; systemic absorption follows topical application; history of renal calculi; chronic corneal defects, history of intra-ocular surgery;

Contra-indications: severe renal impairment of hyperchloraemic acidosis, pregnancy and breast-feeding

Side-Effects: ocular burning, stinging and itching, blurred vision, lacrimation, conjunctivitis, super-facial punctuate keratitis, eyelid inflammation and crusting anterior uveitis, transient myopia, corneal oedema, iridocyclitis, headache, dizziness, paraesthesia, asthenia, sinusitis, rhinitis, nausea, hypersensitivity reactions (including urticaria, angio-edema, bronchospasm); bitter taste, epistaxis, urolithiasis.

Dose: for raised intra-ocular pressure in open-angle glaucoma, or pseudoexfoliative glaucoma when beta-blockers alone not adequate, apply twice daily.

- *Cosopt Ophthalmic Solution contains Dorzolamide (as hydrochloride) 2%, Timolol (as maleate) 0.5%*

TEAR SUBSTITUTES AND LUBRICANTS

BALANCED SALT SOLUTION (BSS)

A sterile iso-osmotic solution containing sodium chloride 0.49%, potassium chloride 0.075%, calcium chloride 0.048%, magnesium chloride 0.03%, sodium acetate 0.39%, and sodium citrate 0.17%.

Indications: for intra-ocular and topical irrigation during surgical procedures.

Sodium chloride 0.9% drops are sometimes useful in tear deficiency, and can be used as ‘comfort drops' by contact lens wearers, and to facilitate lens removal. Special presentations of sodium chloride 0.9% and other irrigation solutions are used routinely for intra-ocular surgery.

- *BSS 15 ml, 500 ml Bottles*

HYPROMELLOSE (Hydroxypropylmethylcellulose))

Indications: tear deficiency; it prolongs the action of medicated eye-drops; used as artificial tears to prevent damage to the cornea in patients with keratoconjunctivitis sicca or keratitis or during gonioscopy procedures.

- *Natural Tears Eye Drops*

WHITE PETROLATUM

Indications: adjunctive therapy to lubricate and protect the eye in exposure keratitis, decreased corneal sensitivity, recurrent corneal erosions, keratitis sicca, ophthalmic and non-ophthalmic surgeries
Cautions: It may cause temporary visual disturbance and are best suited for application before sleep. Ointments should not be used during contact lens wear.
Contra-indications: hypersensitivity reactions
Dose: Administration***:*** pull lower lid to form a pocket, apply small amount of ointment in pocket as needed.

- *Lacri-Lube Ophthalmic Ointment*

DIAGNOSTICS AND PRE-OPERATIVE PREPARATIONS

ACETYLCHOLINE CHLORIDE

Indications: cataract surgery, penetrating keratoplasty, iridectomy, and other anterior segment surgery requiring rapid miosis.
Side Effects: rarely bradycardia, hypotension, breathing difficulty, sweating, flushing
Dose: in most cases a satisfactory miosis is produced in seconds by 1/2-2 ml.

- *Miochol Intra-Ocular 1% solution*

DICLOFENAC SODIUM

Indications: inhibition of miosis during cataract surgery (but does not possess intrinsic mydriatic properties); postoperative inflammation after cataract surgery and other surgical procedures; preoperative and postoperative prevention of cystoid macular oedema associated with

lens extraction and intraocular lens implantation; non-infectious inflammatory conditions affecting anterior region of the eye; post-traumatic inflammation in penetrating and non-penetrating wounds; seasonal allergic conjunctivitis..
Cautions: patients with bleeding tendencies or on anti-coagulants
Side Effects: transient burning or stinging; blurred vision, local oedema, keratitis, irritation, dry eye, lacrimation, corneal infiltrates (discontinue) and staining; photophobia; headache, and rhinitis occasionally reported
Dose: ADULT and CHILD over 3 years, apply twice daily. preoperative, 5x1 drop over the 3 hours preceding surgery. Postoperative, 3x1 drop immediately after surgery, thereafter 3-5x1 drop daily for as long as required.

- *Voltarol Ophtha Eye Drops 0.1% - 5 ml*

FLUORESCEIN SODIUM

Indications: detection of lesions and foreign bodies; examination of the ophthalmic vasculature by retinal angiography
Fluorescein sodium and rose bengal are used in diagnostic procedures and for locating damaged areas of the cornea due to injury or disease. Rose bengal is more efficient for the diagnosis of conjunctival epithelial damage but it often stings excessively unless a local anaesthetic is instilled beforehand.
Dose: topically by application of the tip of the strip. By IV injection, 500 mg. Child, 7.5 mg/kg bodyweight

- *Fluorets Strips*
- *Fluorescein Injection 10%*

HYALURONATE SODIUM

Each ml contains sodium hyaluronate 10 mg, sodium chloride 8.5 mg, disodium hydrogen phosphate dihydrate 0.28 mg, sodium dihydrogen phosphate hydrate 0.04 mg in sterile water for injection.
Indications: eye surgery. It maintains a deep anterior chamber during surgery, allowing for efficient manipulation with fewer traumas to the corneal endothelium and other surrounding tissues; its visco-

elasticity helps to push back the vitreous fluid and prevent formation of a postoperative flat chamber. It is slowly removed after 6 days if left in the anterior segment of the eye after operation.
Cautions: increased intra-ocular pressure due to overfilling of the anterior or posterior segments of the eye.
Side Effects: post-operative inflammatory reactions, corneal oedema, corneal decompensation, transient post-operative rise in intra ocular pressure.
Dose: it varies with the type of surgery. Usually a dose of 0.2 to 0.6 ml is introduced through a thin cannula into the anterior segment of the eye during surgery, whereas larger amounts are used in the posterior segment.

- *Haelon Injection*

BRIMONIDINE

a selective alpha$_2$-adrenoceptor stimulant.
Indications: raised intra-ocular pressure in open-angle glaucoma or ocular hypertension in patients for whom beta-blockers are inappropriate; as adjunctive therapy when intra-ocular pressure is inadequately controlled by other antiglaucoma therapy.
Cautions: severe cardiovascular disease; cerebral or coronary insufficiency, Raynaud's syndrome, postural hypotension, depression, hepatic or renal impairment; pregnancy, breast-feeding; Drowsiness may affect performance of skilled tasks (e.g. driving).
Side Effects: conjunctival hyperaemia, burning, stinging, pruritus, allergy, and conjunctival folliculosis, visual disturbances, blepharitis, epiphora, corneal erosion, superficial punctuate keratitis, eye pain, discharge, dryness, and irritation, eyelid inflammation, oedema, pruritus conjunctivitis, photophobia; also, hypertension, headache, depression, dry mouth, fatigue, drowsiness; less commonly, taste disturbances, palpitation, dizziness, syncope, rhinitis, nasal dryness.
Dose: Apply twice daily

- *Alphagan Eye Drop*

OFLOXACIN

Indications: active against a wide variety of bacteria.

Cautions: Pregnancy, breast feeding not to be used for more than 10 days.
Side Effects: local irritation including photophobia; dizziness, numbness, nausea and headache.
Dose: Apply 1 drop at least every 2 hours then reduce frequency as infection is controlled and continue for 48 hours after healing

- *Exocin Eye Drop*

LATANOPROST

Indications: raised intra-ocular pressure in open-angle glaucoma; ocular hypertension
Cautions: before initiating treatment, advise patients of possible change in eye colour; monitor for eye colour change; aphakia, or pseudophakia with torn posterior lens capsule or anterior chamber lenses; risk factors for iritis, uveitis, and cystoid macular oedema; brittle or severe asthma; not to be used within 5 minutes of use of thiomersal-containing preparations; Pregnancy; Breast Feeding.
Side Effects: brown pigmentation particularly in those with mixed-colour irides; blepharitis, ocular irritation and pain; darkening, thickening and lengthening of eye lashes; conjunctival hyperaemia; transient punctate epithelial erosion; skin rash; less commonly eyelid oedema and rash; rarely dyspnea, exacerbation of asthma, iritis, uveitis, local oedema, darkening of palpebral skin; very rarely chest pain, exacerbation of angina
Dose: Apply once daily, preferably in the evening; CHILD not recommended

- *Xalatan 50 mcg / ml*

SUBFOVEAL CHOROIDAL NEOVASCULARISATION

RANIBIZUMAB

Indications: ranibizumab are vascular endothelial growth factor inhibitors licensed for the treatment of neovascular (wet) age-related macular degeneration. Aflibercept is also licensed for the treatment of macular oedema secondary to central retinal vein occlusion; ranibizumab is also licensed for the treatment of visual

impairment due to diabetic macular oedema, macular oedema secondary to branch or central retinal vein occlusion, and choroidal neovascularisation secondary to pathologic myopia. Ranibizumab can be administered concomitantly with laser photocoagulation for the treatment of diabetic macular oedema and for macular oedema secondary to branch retinal vein occlusion. They are given by intravitreal injection by specialists experienced in the management of this condition. There is a potential risk of arterial thromboembolic events and non-ocular haemorrhage following the intravitreal injection of vascular endothelial growth factor inhibitors. Endophthalmitis can occur after intravitreal injections—patients should be advised to report any signs of infection immediately.

Cautions: history of stroke or transient ischaemic attack; patients at risk of retinal pigment epithelial tear; monitor intra-ocular pressure, perfusion of the optic nerve head, and for signs of ocular infection following injection; retinal detachment or macular hole—discontinue treatment if rhegmatogenous retinal detachment or stage 3 or 4 macular hole develops; diabetic macular oedema due to type 1 diabetes (limited information available); previous intravitreal injections; active systemic infection; proliferative diabetic retinopathy; uncontrolled hypertension; diabetic patients with HbA1c over 12%

Contra-indications: ocular or periocular infection; severe intra-ocular inflammation; signs of irreversible ischaemic visual function loss in patients with retinal vein occlusion

Pregnancy: manufacturer advises avoid unless potential benefit outweighs risk and recommends women use effective contraception during and for at least 3 months after treatment

Breast-feeding: manufacturer advises avoid—no information available

Side Effects: nausea, headache, nasopharyngitis, cough, anxiety, anaemia, urinary tract infection, arthralgia, raised intra-ocular pressure, visual disturbance, conjunctival, retinal, and vitreous disorders, ocular discomfort, eye haemorrhage, uveitis, iritis, blepharitis, iridocyclitis, cataract, posterior capsule opacification, punctuate keratitis, anterior chamber flare, conjunctivitis, photopsia, photophobia, eyelid oedema, allergic skin reactions; less

commonly blindness, hypopyon, hyphaema, keratopathy, corneal disorders, iris adhesion

Dose: Neovascular (wet) age-related macular degeneration, by intravitreal injection, ADULT over 18 years, 500 mcg once a month into the affected eye; monitor visual acuity monthly; continue treatment until visual acuity is stable for 3 consecutive months; thereafter monitor visual acuity monthly; if necessary subsequent doses may be given at least 1 month apart

Diabetic macular oedema, macular oedema secondary to retinal vein occlusion, by intravitreal injection, ADULT over 18 years, 500 mcg once a month into the affected eye; monitor visual acuity monthly; continue treatment until visual acuity is stable for 3 consecutive months (discontinue treatment if no improvement in visual acuity after initial 3 injections); thereafter monitor visual acuity monthly; if necessary subsequent doses may be given at least 1 month apart

Choroidal neovascularisation secondary to pathologic myopia, by intravitreal injection, ADULT over 18 years, initially 500 mcg as a single injection into the affected eye; monitor for disease activity monthly for first 2 months, then at least every 3 months thereafter during the first year, then as required; if necessary subsequent doses may be given at least 1 month apart

Concomitant treatment of diabetic macular oedema, or macular oedema secondary to branch retinal vein occlusion, with laser photocoagulation, by intravitreal injection, ADULT, 500 mcg at least 30 minutes after laser photocoagulation

- *Lucentis Solution for intravitreal injection, 10 mg/ml*

12 - EAR, NOSE, AND OROPHARYNX

DRUGS ACTING ON THE EAR

DEXAMETHASONE

Indications: eczematous inflammation in otitis externa.
Cautions: avoid prolonged use.
Contra-indications: untreated infection.
Side Effects: hypersensitivity reactions.
Dose: apply 2-3 drops 3-4 times daily.

- *Sofradex Ear & Eye Drops 0.05% Contains Dexamethasone Sodium Metasulphobenzoate 0.05% + Framycetin Sulphate 0.5% + Gramicidin 0.005%*

FLUMETASONE PIVALATE

Indications: bacterial and fungal infection in the otitis externa, eczema of auditory meatus, otomycosis.
Cautions: perforation of the tympanic membrane; avoid prolonged use; hypersensitivity reactions may occur.
Contra-indications: untreated infection.
Side Effects: local sensitivity reactions
Dose: 2-3 drops into the ear twice daily for up to 10 days. NOT recommended for children under 2 years.

- *Locacorten Vioform Ear Drops Contains Flumetasone Pivalate 0.02% + Clioquinol (A Compound With The Antibacterial & Antifungal Activity Contraindicated In Children).*

OTOSPORIN

It is an eardrop contains hydrocortisone 1%, neomycin sulphate 3400 units, poly-mixin B sulphate 10, 000 unit/ml.
Indications: eczematous inflammation in otitis externa.
Cautions: avoid prolonged use
Contra-indications: untreated infection
Side Effects: local sensitivity reactions
Dose: Adult and child over 3 years, apply 3 drops into ear 3-4 times daily

- *Otosporin Ear Drops*

DOCUSATE SODIUM

Indications: soften and remove wax.

- *Docusate sodium Ear Drops 5%*

DRUGS ACTING ON THE NOSE

Oral decongestants such as oral antihistamines and some sympathomimetics are discussed under respiratory system.

BENZOIN TINCTURE

Indications: treatment of catarrh of the upper respiratory tract.
Cautions: not advised for infants under the age of 3 months
Method of use: add 5 ml of the benzoin tincture to 500 ml of hot water (not boiling) and inhale the vapor.

- *Benzoin Tincture Inhalation 1%*

XYLOMETAZOLINE HYDROCHLORIDE

Indications: nasal congestion.
Side Effects: **(**see ephedrine) It may cause a hypertensive crisis if used during treatment with MAO-inhibitors including moclobemide.
Dose: instill xylometazoline HCl 0.1% 2-3 drops into each nostril 2-3 times daily when required; max. duration 7 days; not recommended for children over 12 years. Instill xylometazoline HCl 0.05% 1 – 2 drops into each nostril 1 – 2 times daily when required. Not recommended for infants under 3 months of age.

- *Otrivine Drops 0.1% Adult*
- *Otrivine Drops 05% (Children Over 3 months)*

DRUGS ACTING ON THE OROPHARYNX

BORIC ACID

Indications: paint for throat and tongue in children and to alleviate dryness of the mouth.

- *Boroglycerin Paint 5%*

CHOLINE SALICYLATE

Indications: relief of pain and discomfort of common mouth ulcers, cold sores, denture sore spots and infant teething.
Cautions: Excessive use, specially in children, can lead to salicylate poisoning.
Dose: using a clear finger, massage approximately ½ inch of the gel onto the sore area, not more than once every three hours; child over 4 months ¼ inch of gel, not more than every 3 hrs; max. 6 applications daily.

- *Bonjela Gel*

CHLORHEXIDINE GLUCONATE

It is a mouthwash contain chlorhexidine gluconate 0.2%.
Indications: oral hygiene and plaque inhibition.
Cautions: It may be incompatible with some ingredients in toothpaste; leave an interval of at least 30 minutes between using mouthwash and toothpaste.
Side Effects: mucosal irritation (if desquamation occurs, discontinue treatment of dilute mouthwash with an equal volume of water); taste disturbances; reversible brown staining of teeth; tongue discoloration; parotid gland swelling.
Dose: rinse mouth with 10 ml for about 1 minute twice daily.

- *Chlorhexidine 0.2% Mouthwash*

HYDROGEN PEROXIDE

Indications: mouth wash, cleansing agent for discharging ulcers and abscesses.
Cautions: avoid prolonged use; not to be ingested.
Dose: use 15 ml of the 3% to rinse the mouth for 2-3 minutes. If using the 6% (20 volumes), use 15 ml in half tumbler-full of warm water 2-3 times daily.

- *Hydrogen Peroxide Diluted To 10 Volumes,*

NYSTATIN

Indications: oral and perioral fungal infections.
Dose: place 1 ml in the mouth and retain near lesions 4 times daily; should be continued for 48 hours after clinical cure.

- *Mycostatin Suspension 100, 000 Units/ml*

SOLCOSERYL

It consists of deproteinized calves blood extract 5% (haemodialysate and polidocanol 1% (local anaesthetic).
Indications: painful and inflammatory infections of the oral mucosa, gums and lips; denture pressure sores; teething pain.
Dose: apply a thin layer to the lesion 3-5 times daily. Paste should not be rubbed and should be applied to a dry area for better adhesion.

- *Solcoseryl Dental Adhesive Paste*

13 - SKIN

EMOLLIENT AND BARRIER PREPARATIONS

PANTHENOL

Indications: wounds, burns and fissures.
Administration: apply once or twice daily;
For fissured nipples; apply as a dressing immediately after each feed.

- *Bepanthen Cream 5%*
- *Dexipan Cream 5%*

VASELINE (White soft paraffin))

Indications: ointment base; emollient in skin disorders.

- *Aqueous Cream*
- *Emulsifying Ointment*

ANTI-PRURITIC PREPARATIONS

CALAMINE

Indications: Pruritis

- *Calamine Lotion (Calamine 15% With Zinc Oxide 5%)*

CROTAMITON

Indications: pruritis and scabies.
Cautions: avoid use near eyes and broken skin; children under 3 years.
Contra-indications: acute exudative dermatoses.
Dose: scabies, apply over the whole body omitting the head and neck, after a hot bath, and remove by washing the following day. The application may be repeated 24 hours later but a bath should not be taken until the following day. pruritis, apply 2-3 times daily.
Child below 3 years, apply once daily.

- *Eurax Cream10 %*

TOPICAL CORTICOSTEROIDS

BETAMETHASONE VALERATE

Indications: severe inflammatory skin disorders such as eczema in patients unresponsive to less potent corticosteroids

Cautions: applications of more than 100 g per week of 0.1% preparation is likely to cause adrenal suppression. Should not be used indiscriminately in pruritis; avoid prolonged use in children and infants; (extreme caution in dermatoses of infancy including napkin rash-where possible treatment should be limited *to* 5-7 days); avoid prolonged use on the face.

Contra-indications: in infants and young children; rosacea, perioral dermatitis***:*** acne vulgaris; untreated bacterial, fungal, or viral skin lesions.

Side Effects: absorption is greatest from areas of thin skin, raw surfaces, and intertriginous areas and is increased by occlusion; spread and worsening of untreated infection; reversible thinning of the skin but irreversible change of original structure; irreversible striae atrophicae; increased hair growth, perioral dermatitis.

Dose: apply sparingly 2-3 times daily, reducing strength and frequency as condition responds.

- *Betasone Cream 0.1 %*
- *Betasone Ointment 0.1%*
- *Celestoderm- V Lotion 0.1%*

FLUMETASONE PIVALATE

Indications: acute to hyper chronic, inflammatory and/or dysplastic skin disease; hyperkeratotic conditions; eczema; neurodermatitis, psoriasis vulgaris.

Caution*;* long term treatment especially of the facial skin should always be avoided regardless of the patient's age; infants and children should be treated with caution; occlusive dressings should be of limited duration and confined to small areas of diseased skin; patients with severe renal failure in view of the possibility of salicylate absorption; acute weeping stages or subacute stages if there is still risk of exudation, mucous membranes.

Contra-indications: Tuberculosis of the skin, syphilitic skin affections, and fresh virus infections of the skin; hypersensitivity to any of the components; perioral dermatitis, acne vulgaris, rosacea.
Side Effects local sensitivity reactions
Dose: apply sparingly once or twice daily.

- *Locasalen Ointment 0.02% (With 3% Salicylic Acid)*

FLUOCINOLONE ACETONIDE

Indications: inflammatory skin disorders such as eczema; soriasis.
Cautions: breast-feeding during prolonged treatment
Contra-indications: bacterial, fungal or viral infections of the skin.
Side Effects: irritation, folliculitis, hypertrichosis, acne, decrease in skin pigmentation. side effects increase with occlusion.
Dose: apply sparingly 2-3 times daily reducing strength and frequency as condition responds.

- *Synalar Cream 0.025%*
- *Synalar Ointment 0.025%*

HYDROCORTISONE

Indications: mild inflammatory skin disorders.
Cautions: avoid extensive and prolonged use; infants and children; avoid prolonged use on the face.
Contra-indications: Untreated bacterial, fungal or viral skin lesions.
Dose: Apply sparing 2-3 times daily, reducing strength and frequency as condition responds

- *Alfacort Cream 1%*

MOMETASONE FUROATE

Indications: severe inflammatory skin conditions; pruritic manifestations; psoriasis and atopic – dermatitis
Caution, contra-indications & Side Effects: As for betamethsone valerate
Dose: a thin film is applied once daily

- *Elocom Cream.1%*
- *Elocom Ointment 0.1%*

PREPARATION FOR PSORIASIS AND ECZEMA

ACITRETIN

This is a metabolite of etretinate

Indications severe resistant or complicated psoriasis, congenital disorders of keratinization including Darier's disease (keratosis follicularis).

Cautions: avoid in hepatic impairment, monitor liver function and plasma lipids (especially in patients with hypertriglyceridaemia) 1 month after initiating treatment and then at 3 monthly intervals. Exclude pregnancy before starting; patients should avoid pregnancy at least 1 month before, during and for at least 2 years after treatment; should avoid concomitant high doses of vitamin A and should not donate blood during or for 2 years after stopping therapy (teratogenic risk); radiographic assessment on long-term treatment; investigate atypical musculoskeletal symptoms; avoid long term use in children (skeletal hyperostosis and extra-osseous calcification).

Contra-indications: hepatic and renal impairment; pregnancy and breast-feeding.

Side Effects: ***(***Mainly dose-related) dryness and erosion of mucous membranes, scaling, thinning erythema and pruritis of skin and conjunctiva; palmar and plantar exfoliation, epistaxis and epidermal fragility; paronychia, reversible alopecia; myalgia and anthralgia; nausea, headache, malaise, drowsiness and sweating; benign intracranial hypertension; raised liver enzymes, jaundice and hepatitis, raised triglycerides.

Dose: initially 25-30 mg daily for 2-4 weeks. Maintenance, 25-50 mg daily (may reach 75 mg in some cases) for further 6-8 weeks.

Child, (in very exceptional cases only) 500 mcg/kg. daily with careful monitoring of musculoskeletal development.

- *Neotigason 10mg, 25mg Capsules*

CALCIPOTRIOL

This is a vitamin D analogue that affects cell division and differentiation.

Indications: plaque psoriosis

Cautions: pregnancy; not to be used on the face; careful hand washing after use is recommended; children; risk of hypercalcaemia if max. recommended weekly dose exceeded.
Contra-indications: hypersensitivity to the drug constituents; disorders of calcium metabolism.
Side Effects: transient local irritataion; facial dermatitis may occur. photosensitivity; skin atrophy
Dose *Cream* or *ointment* apply once or twice daily; max. 100g weekly (less with *scalp solution*); child over 6 years, apply twice daily; 6–12 years max. 50g weekly; over 12 years max. 75g weekly

- *Divobet Gel (+Betamethasone)*
- *Divobet Oint. (+Betamethasone)*

SALICYLIC ACID

Indications: hyperkeratoses.
Cautions: avoid broken or inflamed skin.
Side Effects: sensitivity, excessive drying, irritation, systemic effects after prolonged use.
Administration: apply to hydrated skin, cover with an occlusive dressing, preferably overnight and remove by washing; wash hands thoroughly after use.

- *Salicylic Acid 2% Ointment*

PREPARATIONS FOR ACNE

SALICYLIC ACID

Indications: acne vulgaris.
Administration: apply to clean skin once twice daily.

- *Acne Lotion (1% Salicylic Acid With 1% Resorcinol)*

ISOTRETINOIN

It is an isomer of tretinoin.
Indications: severe forms of nodulo-cystic acne which are resistant to previous therapy, particularly cystic acne and conglobate acne especially when the lesions involve the trunk.
Cautions: liver function should be checked before and one month after the start of treatment, and subsequently at

three month intervals; serum lipids should also be checked.
Contra-indications: blood donation by patients who are treated (one or two weeks) with the drug to women of child-bearing age is contra-indicated; pregnancy; hepatic and renal insufficiency; hypervitaminosis A; patients with excessively elevated blood lipid values; hypersensitivity to the drug; concurrent use of other keratolyses or exfoliative acne drugs; exposure to sun; UV exposure.
Side Effects: dryness of the skin, nasal mucosa and conjunctiva; visual disturbances; malaise and drowsiness; change in blood picture; mood changes and depression.
Drug Interactions possible increased risk of benign intracranial hypertension when retinoids given with tetracyclines; risk of hypervitaminosis A when given with vitamin A; it possibly reduces plasma concentration of carbamazepine.
Dose: Initially, 500 mcg/kg daily; after 4 weeks the dose is adjusted within the range of 0.1-1.0 mg/kg daily. The max. dose of 1 mg/kg daily should be given for only a limited period of time.
Treatment lasts for 16 weeks. There is often an improvement after the discontinuation of the treatment and thus a period of at least 8 weeks is needed before restarting the treatment.

- *Roaccutane Capsules 10 mg & 20 mg*

PREPARATIONS FOR WARTS AND CALLUSES

SILVER NITRATE

Indications warts, verrucas, umbilical granulomas, over-granulating tissue, cauterisation
Cautions: protect surrounding skin and avoid broken skin; not suitable for application to face, ano-genital region, or large areas
Side Effects: chemical burns on surrounding skin; stains skin and fabric
Dose: Common warts and verrucas, apply moistened caustic pencil tip for 1–2 minutes; repeat after 24 hours upto max. 3 applications for warts or max. 6 applications for verrucas

Note : Instructions in proprietary packs generally incorporate advice to remove dead skin before use by gentle filing and to cover with adhesive dressing after application. Umbilical granulomas, apply moistened caustic pencil tip (usually containing silver nitrate 40%) for 1–2minutes while protecting surrounding skin with soft paraffin

- *Sliver Nitrate Caustic pencil*

ANTI-INFECTIVE SKIN PREPARATIONS

ANTI-BACTERIAL PREPARTIONS

FUSIDICACID

Indications: staphylococcal skin infections and abscesses.
Cautions: avoid contact with eyes.
Side Effects: rarely hypersensitivity reactions
Dose: Apply 2- 3 times

- *Fucidin 2% Cream*
- *Fucidin 2% Ointment*
- *Fucicort cream (Fusidic acid 2% + Betamethasone valerate 0.1 cream)*

MUPIROCIN

This is a topical broad-spectrum antibiotic.
Indications: bacterial skin infections e.g. impetigo, folliculitis, and furunculosis.
Cautions: as with other polyethylene based ointments, the preparation should be used with caution in moderate or severe renal impairment
Side Effects local reactions including urticaria, pruritus, burning sensation, rash
Dose Apply up to 3 times daily for up to 10 days; infant under 1 year not recommended

- *Bactroban 2% Ointment*

NEOMYCIN SULFATE

Indications: bacterial skin infections.

Cautions: If large areas of skin are being treated - ototoxicity may be a hazard, particularly in children, in the elderly, and in those with renal impairment.
Contra-indications: In neonates
Side Effects: sensititization
Dose: apply up to 3 times daily; for short-term use only.***:***

- *Neomycin & Bacitracin Cream;*

NITROFURAZONE

Indications: superficial skin infections.
Side Effects: local hypersensitivity reactions.
Dose: apply 3 or more times daily.

- *Furacin 0.2% Soluble Dressing*

SILVER SULFADIAZINE

Indications: skin infections, particularly Gram-negative infections such as pseudomonas infections in second and third degree burns, infected leg ulcers, and pressure sores.
Cautions: hepatic and renal impairment; G6PD deficiency; pregnancy and breast-feeding.
Contra-indications: sensitivity to sulfonamide. not recommended for neonates
Side Effects: rarely allergic reactions including burning, itching and rashes; argyria reported following prolonged use; leucopenia reported (monitor blood levels)

- *Flamazine1% Cream*

ANTI-FUNGAL PREPARATIONS

ISOCONAZOLE NITRATE

Indications: Fungal skin infections
Cautions: avoid contact with eyes.
Contra-indications: tuberculous or syphilitic skin infections; viral infections; pregnancy.
Side Effects: occasional skin irritation or sensitivity.
Dose & Administration: apply twice daily continuing for 10 days after lesions have healed.
Nail infections, apply daily under occlusive dressing.

- *Daktarin Cream 2%*
- *Travacort Cream 1% (With 0.1% Diflucortolone Valerate)*

NYSTATIN

Indications: skin infections due to Candida spp
Dose: apply 2-4 times daily, continuing for 7 days after lesions have healed.

- *Mycostatin Cream 100, 000 Units/G*

TERBINAFINE

Indications: dermatophyte fungal infections of the skin; ringworm infections where oral therapy is considered appropriate renal and hepatic impairment; oral treatment should be used only when topical treatment is not practicable.
Side Effects abdominal discomfort, anorexia, nausea, diarrhoea; headache; rash and urticaria occasionally with arthralgia or myalgia; less commonly taste disturbance; *rarely* liver toxicity (including jaundice, cholestasis and hepatitis)—discontinue treatment; angioedema, dizziness, malaise, paraesthesia, hypoaesthesia, photosensitivity, serious skin reactions (including Stevens-Johnson syndrome and toxic epidermal necrolysis) —discontinue treatment if progressive skin rash; very rarely psychiatric disturbances, blood disorders (including leucopenia and thrombocytopenia), lupus erythematosus-like effect, and exacerbation of psoriasis.
Dose: adults, 250 mg once daily for 2-6 weeks in tinea pedis, 2-4weeks in tinea corporis, tinea criris and cutaneous candidiasis.
Nail infections, 250 mg once daily for 6 weeks - 3 months.
Toenail infections- longer treatment is required. child***:*** usually for 2 weeks, tinea capitis, over 1 year, body-weight 10–20 kg, 62.5 mg once daily; body-weight 20–40 kg, 125 mg once daily; body-weight over 40 kg, 250 mg once daily

- *Lamisil 250 mg Tablets*

THIOSULFATE SODIUM

Indications: pityriasis versicolor, ring worm infections
Dose: *Apply* once or twice daily.

- *Sodium Thiosulfate 20% Lotion*

VORICONAZOL

Indications: invasive aspergillosis; serious infections caused by Scedosporium spp. Fusarium spp. or invasive fluconazole-resistant Candida spp. (including C. krusei)
Cautions: electrolyte disturbances, cardiomyopathy, bradycardia, symptomatic arrhythmias, history of QT interval prolongation, concomitant use with other drugs that prolong QT interval; patients at risk of pancreatitis; monitor renal function
Hepatotoxicity Phototoxicity
Contra-indications: acute porphyria
Hepatic impairment: in mild to moderate hepatic cirrhosis use usual loading dose then halve maintenance dose; no information available for severe hepatic cirrhosis—manufacturer advises use only if potential benefit outweighs risk.
Renal impairment: intravenous vehicle may accumulate if eGFR less than 50 ml/minute/1.73 m^2—use intravenous infusion only if potential benefit outweighs risk, and monitor renal function; alternatively, use tablets or oral suspension (no dose adjustment required)
Pregnancy: toxicity in animal studies—manufacturer advises avoid unless potential benefit outweighs risk; effective contraception required during treatment
Breast-feeding: manufacturer advises avoid—no information available
Side Effects: nausea, vomiting, abdominal pain, diarrhoea, jaundice, oedema, hypotension, chest pain, respiratory distress syndrome, sinusitis, headache, dizziness, asthenia, anxiety, depression, confusion, agitation, hallucinations, paraesthesia, tremor, influenza-like symptoms, hypoglycaemia, haematuria, blood disorders (including anaemia, thrombocytopenia, leucopenia, pancytopenia), acute renal failure, hypokalaemia, visual disturbances (including altered perception, blurred vision, and photophobia), rash, pruritus, photosensitivity, alopecia, cheilitis, injection-site reactions.
less commonly dyspepsia, duodenitis, cholecystitis, pancreatitis, hepatitis, constipation, arrhythmias (including QT interval prolongation), syncope, hyponatraemia, raised serum cholesterol, hypersensitivity reactions (including flushing), ataxia, nystagmus,

hypoaesthesia, adrenocortical insufficiency, arthritis, blepharitis, optic neuritis, scleritis, glossitis, gingivitis, psoriasis, Stevens-Johnson syndrome.
rarely pseudomembranous colitis, taste disturbances (more common with oral suspension), convulsions, extrapyramidal effects, insomnia, tinnitus, hearing disturbances, hypertonia, hypothyroidism, hyperthyroidism, discoid lupus erythematosus, toxic epidermal necrolysis, pseudoporphyria, retinal haemorrhage, optic atrophy; also reported on long-term treatment squamous cell carcinoma of skin (particularly in presence of phototoxicity) and periostitis (particularly in transplant patients)
Dose: By mouth, adult over 18 years, body-weight over 40 kg, 400 mg every 12 hours for 2 doses then 200 mg every 12 hours, increased if necessary to 300 mg every 12 hours; body-weight under 40 kg, 200 mg every 12 hours for 2 doses then 100 mg every 12 hours, increased if necessary to 150 mg every 12 hours.
By intravenous infusion: 6 mg/kg every 12 hours for 2 doses, then 4 mg/kg every 12 hours (reduced to 3 mg/kg every 12 hours if not tolerated) for max. 6 months

- *Vfend Tablets 200 mg*
- *Vfend Intravenous infusion, powder for reconstitution, 200-mg vial*

PARASITICIDAL PREPARATIONS

BENZYL BENZOATE

Indications: scabies, pediculosis
Cautions: children (not recommended,), avoid contact with eyes and mucous membranes; do not use on broken or secondarily infected skin
Side Effects: slight skin irritation, transient burning sensation especially on genitalia and excoriations, occasionally rashes.
Dose: Apply over the whole body; repeat without bathing on the following day and wash off 24 hours later; a third application may be required in some cases
Note: Not recommended for children—dilution to reduce irritant effect also reduces efficacy. Some manufacturers recommend application to the body but to exclude the

head and neck. However, application should be extended to the scalp, neck, face, and ears
Breast feeding: suspend feeding until product has been washed off.

- *Benzyl Benzoate 25%Application**:***

DISINFECTANTS AND CLEANSERS

ALCOHOL

Indications: skin preparation before injection
Cautions: flammable, avoid broken skin.

- *Surgical Spirit 70%*
- *Industrial Methylated Spirit*

CETRIMIDE

Indications: skin disinfection; soap or shampoo substitute in acne, skin infections and seborrhoea of the scalp.
Cautions: avoid contact with eyes; avoid use in body cavities.
Side Effects skin irritation and occasionally sensitisation

- *Cetavlon 1% & 20% Solution*
- *Hibicet Hospital Concentrate (With Chlorhexidine)*

CHLORHEXIDINE

Indications: instead of soap as pre-operative scrub or disinfectant wash for hands and skin.
Cautions: avoid contact with eyes, brain, meninges and middle ear; not for use in body cavities.
Side Effects: hypersensensitivity reactions.

- *Hihicet Hospital Concentrate (With Cetrimide).*
- *Hibiscrub 4% Cleansing Solution.*
- *Hibitane Obstetric 1 % Cream.*

CRYSTAL VIOLET (Gentian Violet))

Indications: minor skin wounds,
Cautions: stains clothes and skin.

- *Gentian Violet Paint 0.5%*

ETHER

Note: solvent ether is not intended for anaesthesia; only ether of a suitable quality should be used.
Indications: cleansing the skin before surgical operations and for removal of adhesive plaster from the skin.
Its use in the topical treatment of herpes simplex virus infections has inconsistent results.

GLUTARALDEHYDE

Indications: warts, particularly plantar warts.
Cautions: protect surrounding skin; not for application to face, mucosa, or ano-genital areas.
Side Effects: rashes, skin irritation (discontinue if severe); stains skin brown.
Dose Apply twice daily

- *Cidex*
- *Oph-Cidex "Ortho-Phathaldehide*

HYDROGEN PEROXIDE

Indications: skin disinfection, particularly cleansing and deodorizing wounds ulcers.
Cautions: bleaches fabric; solutions above 6% (20 volumes) should be diluted before application to the skin. incompatible with products containing iodine and potassium permanganate.

- *Hydrogen Peroxide 3% (10 Volumes)*

Kenacomb

Indications: for use in corticosteroid responsive severe inflammatory skin disorders such as Atopic dermatitis, Seborrhoeic dermatitis, Lichen simplex chronicus, Psoriasis (particularly of the face and body folds) and Allergic contact dermatitis.Cream permits use in moist intertrigenous areas.
Caution Prolonged use may result in overgrowth if non-susceptible organisms, including fungi other than candida; Use with particular caution in facial dermatoses, and only for short periods. A rosacea-like faces may be produced. Use with caution near the eyes.
Contra-indications: patients with tuberculous lesions, topical or systemic viral infections. ophthalmic use, nor

should it be applied in the external auditory canal of patients with perforated eardrums. pregnancy.
Side Effects Burning, itching, irritation, dryness, folliculitis, hypertrichosis, acne form eruptions, hypo pigmentation, perioral dermatitis, allergic contact dermatitis, maceration of the skin, secondary infection, skin atrophy, striae, and miliaria due to corticosteroid. Nystatin is well tolerated even with prolonged therapy. Irritation and cases of contact dermatitis have been reported. Delayed type hypersensitivity reactions have been reported during use of neomycin; sensitization has been reported following prolonged use. Ototoxicity and nephrotoxicity have been reported when applied to large surfaces or damaged skin. Sensitivity reactions to gramicidin have been reported.
Dose: Apply a thin film of ointment or rub the cream to the affected areas 2 or 3 times daily.
Pregnancy: Teratogenic

- *Kenacomb Cream & Ointment*

Each gram contains 100000 units nystatin, 2, 5 mg neomycin base (as sulphate), 0, 25mg gramicidin, and 1.0 mg triamcinolone acetonide.

ACYCLOVIR

Indications: local treatment of herpes simplex and vericella - zoster infections.
Cautions: avoid contact with eyes and mucous membrane
Side Effects: local irritation and inflammation reported; very rarely hypersensitivity reactions including angioedema
Dose: Apply 5 times daily (continue for at least 3 days after complete healing)

- *Zovirax 3% Eye Ointment*

14 - IMMUNOLOGICAL PRODUCTS AND VACCINES

VACCINES

ADSORBED DIPHTHERIA AND TETANUS TOXOIDS (Double Vaccine, DT)

Indications: Active immunization against diphteria and tetanus in infants and children under the age of six years, when it is unadvisable or contra-indicated to give a triple antigen containing pertussis component.
Contra-indications: Active or acute infection, concomitant corticosteroid therapy, immunosuppressive therapy, history of hypersensitivity.
Dose: For primary immunization with diphtheria and tetanus vaccine, three doses of 0.5 ml are needed; the given 8 weeks apart and the first booster dose at 18 months of age.
A second booster dose of 0.5 ml IM is recommended at the time of school entry (about 5-6 years of age).
All doses are IM

ADSORBED DIPHTHERIA - TETANUS VACCINE WITH REDUCED DIPHTHERIA COMPONENT

A mixture of diphtheria formol toxoid and tetanus formol toxoid adsorbed ona mineral carrier.
Indications: for combined active immunization of adults against diphtheria and tetanus.
Contra-indications: acute feverish illnesses.
Dose: IM injections of 0.5 ml at intervals of 4 weeks. A third injection, after 3 to 12 months, is recommended.

- *Di Te Anatoxal Berna For Adults - Double Vaccine*

ADSORBED DIPHTHERIA -TETANUS-PERTUSSIS VACCINE

A mixture of purified and adsorbed diphtheria and tetanus formol toxoids, as well as Bordetella pertussis vaccine.
Indications: diphtheria, tetanus and pertussis prophylaxis.

Contra-indications: acute infectious diseases, currently evaluating disease whether acute or chronic, personal history of neurological problems like convulsions, encephalitis and encephalopathy.
Dose: infants and children until six years of age, 3 (primary) doses of 0.5 ml each at 4-8 weeks intervals followed by a fourth (reinforcing) dose of 0.5 ml about one year after the third primary dose.
The fourth dose is part of the basic course. A booster dose at age 4-6 years All doses are IM or deep SC

- *Di Te Per Anatoxal Berna, Triple Vaccine*

HAEMOPHILUS INFLUENZAE B (Hib) VACCINE

Indications: active immunizations against H. influenzae type B infections in children; component of the primary course of childhood immunization.
Side effects and Precautions: Fever, restlessness, loss of apetite, vomiting diarrhea and hypersensitivity. Erythema multiforme and transient cyanosis of the lower limbs have been reported rarely in children receiving haemophilus influenzae-containing vaccines.
Dose: 0.5 ml. (25 mcg of polysaccharide linked to 18 mcg of diphtheria toxoid protein) given by IM injection. For primary immunization, 3 doses are required at intervals of 1 month.

HEPATITIS B VACCINE

Alum-adsorbed, inactivated hepatitis-B virus surface antigen (Hbs Ag) vaccine.
It is prepared biosynthetically using recombinant DNA technology. The vaccine is used in individuals at high risk of contracting hepatitis B. It takes up to 6 months for immunisation to confer adequate protection; the duration of immunity is thought to last for 3-5 years.
Side Effects: abdominal pain, gastrointestinal disturbance, musculoskeletal, joint pain and inflammation have been reported after hepatitis B vaccines. There may also be dizziness and sleep disturbance. Cardiovascular effects include occasional hypotension and, rarely, tachycardia. Other rare adverse effects include dysuria, visual disturbances, and earache.

Dose: adults and children over 12 years, by intramuscular injection, 3 doses of 1 ml, the second one month and the third 6 months after the first dose.
Child, birth to 12 years, 3 doses of 0.5 ml (10 mcg).
For rapid immunization, third dose 2 months after first dose with booster at 12 months.
Infants born to HBs Ag-positive mothers, 3 doses of 0.5 ml (10 mcg), first dose at birth with antihepatitis B immunoglobulin injection (separate site).

- *Engerix B 10, 20 mcg/ml*
- *Hepatitis B for child 10mcg Single dose*

hexa Combined Diphtheria-Tetanus-acellular Pertussis (DTPa), Hepatitis B, Inactivated Poliovirus and Haemophilus influenzae type b Vaccine

Indications: Active primary immunization against six diseases***:*** diphtheria, tetanus, pertussis (whooping cough), hepatitis B, poliomyelitis (polio) and Haemophilus influenzae type b (Hib).
Contra-indications: Active or acute infection, concomitant corticosteroid therapy, immunosuppressive therapy, history of hypersensitivity; brain disease or central nervous system (CNS)
disease (i.e. Epilepsy etc.); a bleeding problem; a tendency to febrile convulsions; a family history of seizures/fits; a family history of Sudden Infant Death Syndrome (SIDS).
Side Effects: Mild effects- pain, redness, swelling, a hard lump, bruising or itching around the injection site. fever between 38 °C and 39.5 °C. unusual crying (for more than 1 hour), vomiting, diarrhoea, runny nose or loss of appetite sleepiness, nervousness, irritability restlessness, fussiness or difficulty sleeping. skin rash, bruising, or purple or red-brown spots visible through the skin (purpura). MORE serious effects***:*** fever greater than 39.5°C; crying for 3 hours or more; collapse or periods of unconsciousness or lack of awareness. seizures (convulsions) or fits
Dose: For primary immunization***:*** three doses of 0.5 ml are given at 2, 4 and 6 months of age.
All doses are IM

- *Infanrix*

INFLUENZA VACCINES

Every year WHO recommends which strains should be included in the vaccine as the viruses A and B are constantly altering their antigenic structures.

Indications: persons at risk; annual immunization is highly
recommended for those of all ages with any of the following conditions*:*
Chronic respiratory disease, including asthma.
Chronic heart disease.
Chronic renal failure.
Diabetes rnellitus.
Immunocompromised patients.
Persons above 75 years of age.

Contra-indications: Vaccination should be postponed if the individual is suffering from an acute illness. Minor illnesses without fever or systemic upset are not contra-***Indications***. Anaphylaxis with a preceding dose of a vaccine (or vaccine component) is a contra-indication to further doses.
Hypersensitivity to egg with evidence of previous anaphylactic reaction, contra-indicates influenza vaccine.

Dose: 0.5 ml by deep SC or IM injection.
Child 6-35 months, 0.25 ml. 3-12 years, 0.5 ml. Both repeated after 4-6 weeks.

MEASLES, MUMPS AND RUBELLA VACCINE (MMR)

Indications: simultaneous immunization against measles, mumps and rubella in children from one year of age.

Contra-indications: pregnancy, acute infectious disease, active developing illnesses, congenital or acquired immuno-deficiency and hypersensitivity to chick embryos and egg proteins; another injectable live vaccine within the previous 3 weeks; 3 months of an immunoglobulin injection; untreated malignant disease.

Contra-indications: to MMR include*:*
children with severe immunosuppression
children who have received another live vaccine by injection within 4 weeks; children who have had an anaphylactic reaction to excipients such as gelatin and

neomycin; if given to women, pregnancy should be avoided for 1 month.
Dose: single dose of 0.5 ml by SC or IM injection.

- *Trimovax*

MENINGOCOCCAL MENINGITIS VACCINE

Indications: it is a component of the primary course of childhood immunization; highest risk groups; pilgrims to mecca during Hajj season and individuals traveling to countries of risk.
Side effects of meningococcal group C conjugate vaccine include redness, swelling, and pain at the site of the injection, mild fever, irritability, drowsiness, dizziness, nausea, vomiting, diarrhoea, anorexia in children, headache, myalgia, rash, urticaria, pruritus, malaise, lymphadenopathy, hypotonia, paraesthesia, hypoaesthesia, and syncope. Hypersensitivity reactions (including anaphylaxis, bronchospasm, and angioedema) and seizures have been reported rarely.
Dose: recommended schedule is 3 doses for children aged 2-4 months, 2 doses for children aged over 4 months and a single dose for all individuals aged over 1 year. Adult and child aged 2 months and over, 0.5 ml by deep SC or I. M. injection.

PENTAVACCINE

A suspension containing diphtheria (D), tetanus (T) toxoids, inactivated pertussis bacteria (Pw) and the purified surface antigen of the hepatitis B virus (HBV), adsorbed on aluminium salts. This suspension is used to reconstitute the lyophilized Hib vaccine in a second vial.
Dose: The preperation should under no circumstances be administered intravenously.
By deep IM injection, at six weeks of age within the primary vaccination schedule which consists of three doses within the first six months of life, 0.5 ml.

- *Tritanrix-Hb With Hiberix Vials*

PNEUMOCOCCAL VACCINE POLYVALENT

Indications: Immmunization against pneumococcal disease caused by pneumococcal types included in the

vaccine only. Use in selected individuals over 2 years of age as follows*:*
Patients who have anatomical dysfunction or who have splenic dysfunction due to sickle cell disease or other causes;
Persons with chronic illnesses in which there is increased risk of pneumococcal disease, such as functional impairment of cardiorespiratory, hepatic and renal systems;
Persons over 50 years of age or older;
Patients with other chronic diseases who may be at greater risk of developing pneumococcal infections;
Patients with Hodgkin's disease if immunization can be given at least 10 days prior to treatment.
Contra-indications: Hypersensitivity to any component of the vaccine; revaccination; previous immunization with any polyvalent pneumococcal vaccine.
Dose: Single dose of 0.5 ml SC or IM
Avoid IV Injection.
Child under 2 years, not recommended.

- *Pneumovax*

POLIOMYELITIS VACCINE

(Live, oral "Sabin Strains", Poliovirus types 1, 2 and 3)
Indications: poliomyelitis prophylaxis; it is a component of the primary immunization of childhood, unimmunized adults.
Contra-indications: immunosuppressed individuals or their household contacts, acute febrile illnesses, debilitating ailment, abdominal pain or diarrhoea, steroid therapy, leukemias, lymphogenus diseases, and dysgammaglobulinemias.
Side Effects: Vaccine-associated poliomyelitis has been reported rarely in recipients of oral poliomyelitis vaccines and in contacts of recipients.
Precautions: Poliomyelitis vaccine may contain trace amounts of antibacterial such as neomycin, polymyxin B, and streptomycin and should be used with caution in patients with severe hypersensitivity to these antibacterial.
Oral poliomyelitis vaccines should not be given to patients with diarrhoea or vomiting.

Because the vaccine virus of oral poliomyelitis vaccines is excreted in the faeces for up to 6 weeks, the contacts of recently vaccinated babies and infants should be advised of the need for strict personal hygiene, particularly hand washing after napkin changing, in order to reduce the possibility of infection in unimmunised contacts. Unimmunised adults can be immunised at the same time as their children.

Oral poliomyelitis vaccines should not be given to immunocompromised patients or their household contacts and in these persons an inactivated vaccine should be used.

Pregnancy: Live vaccines such as oral poliomyelitis vaccines are generally contra-indicated in pregnancy because of a theoretical risk to the fetus.

Dose: three doses of the oral trivalent vaccine are recommended (the first should be given at 2 months of age; the second and the third should be given at intervals of 8 weeks). A fourth dose may be given at 18 months of age.

The immunization can be associated simultaneously with the first dose of DPT.

RABIES VACCINE

Indications: High risk groups, prophylactic and post exposure to attack.

Side Effects: Patients may experience pain, erythema, and induration at the injection site after the use of any type of rabies vaccine; nausea and vomiting, headache, fever, malaise, or myalgia may also occur.

Hypersensitivity reactions including anaphylaxis occur more commonly with vaccines prepared from non-human sources.

Neuroparalytic reactions (transverse myelitis, neuropathy, or encephalopathy) have been associated with the use non-human cell vaccines. There are only isolated reports of neurological reactions after use of human diploid-cell vaccines.

Dose: Prophylaxis, 3-dose schedule on days 0, 7, and 28 with a reinforcing dose every 2-3 years to those at continued risk.

For post-exposure treatment of previously immunized patients, two reinforcing doses on day 0 and on day 3-7.

For post exposure treatment of previously unimmunized patients, a course of injections should be started as soon as possible after exposure on days 0, 3, 7, 14, 30 and 90. The course may be discontinued if the patient found not at risk. Rabies immunoglobulin should be considered on day 0.

ROTAVIRUS VACCINE

This is a live, oral, vaccine for use in preventing rotavirus gastroenteritis in infants.
It is a Human monovalent against strains G1 & P8 of viruses. It is a liquid vaccine that is given by mouth in two doses, between the ages of 6 and 32 weeks.
Indications: It can help protect against rotavirus, a viral infection that may cause diarrhea, vomiting, fever, and dehydration in infants.
Contra-indications: Individuals with immunodeficiency and in those predisposed to, or with a history of intussusception. Its administration should be postponed in infants with diarrhoea or vomiting.
Cautions: Since rotavirus vaccine is excreted in the stool and may be transmitted to close contacts; the vaccine should be used with caution in those with immunosuppresed close contacts. Carers of recently vaccinated baby should be advised to wash hands after changing the baby's nappies.
Side Effects: Diarrhoea, vomiting, abdominal pain, fever and irritability; rarely cramps & rash.
Doses: 2 doses of 1 ml suspension separated by at least 4 weeks (with DTP1, DTP2). The course should be completed before 24 months of age.

- *Rotarix Oral Suspension (Powder For Reconstitution)*

TUBERCULIN PURIFIED PROTEIN DERIVATIVE (PPD)

Indications: diagnostic reagent.
Side Effects: Pain and pruritus may occur at the injection site, occasionally with vesiculation, ulceration, or necrosis in highly sensitive persons. Granuloma has been reported. Nausea, headache, dizziness, malaise, rash, urticaria, oedema, and pyrexia have been reported

occasionally; immediate systemic hypersensitivity, including anaphylaxis, has been reported rarely. There have also been rare reports of lymphangitis.

Contra-indications: Avoid testing within 4 weeks of receiving a live viral vaccine since response to tuberculin may be inhibited.

Dose: Mantoux test, by intradermal injection, routine, 10 units i.e. 0.1 ml of 100 units/ml.

Special (hypersensitive or TB suspected), 1 unit i.e. 0.1 ml of 100 units/ml.

Special (low sensitivity), 100 units i.e. 0.1 ml of 1000 units/ml

A positive and a strongly positive result consist of induration of at least 5 mm and 15 mm respectively in diameter.

Results are read after 48-72 hours but if necessary may be read up to 96 hours after the test.

- *Tuberculin PPD 5TU single dose*

TUBERCULOSIS VACCINE

Bacillus Calmette-Guerin Vaccine (BCG vaccine).

It is a freeze dried preparation of live bacteria derived from the bacillus of Calmette-Guerin.

Indications: It is given at birth to children born to non Bahraini parents. It should be given simultaneously with other live vaccines. If not, then an interval of at least 4 weeks should be allowed between them.

Side Effects: Pain and pruritus may occur at the injection site, occasionally with vesiculation, ulceration, or necrosis in highly sensitive persons. Granuloma has been reported.

Nausea, headache, dizziness, malaise, rash, urticaria, oedema, and pyrexia have been reported occasionally; immediate systemic hypersensitivity, including anaphylaxis, has been reported rarely. There have also been rare reports of lymphangitis.

Precautions: Tuberculin should be given with caution to patients who have, or are suspected of having, active tuberculosis; although severe local reactions may occur in patients with active tuberculosis, sensitivity may be diminished if it is particularly severe. Sensitivity to tuberculin may also be diminished in the following conditions***:*** infection; neoplastic disease; corticosteroid

or immunosuppressive therapy; recent use of live virus vaccines; ultraviolet light treatment; chronic renal failure; dehydration; and malnutrition.
Tuberculins may be adsorbed onto the surface of syringes and should therefore be given immediately.
Dose: New-borns and infants under 3 months, 0.05 ml containing 0.05 mg of BCG by intradermal injection.

TYPHOID VACCINE

It is polysaccharide typhoid vaccine.
Indications: Typhoid vaccines are used for active immunisation against typhoid fever, especially for travellers to areas with poor sanitation standards.
Side Effects: Local reactions including pain, swelling or erythema.
Dose: 0.5 ml by deep SC or IM injection for children above 2 years and adults every 3 years.

- *Typherix*
- *Typhim VI*

YELLOW FEVER VACCINE

It is live attenuated yellow fever virus.
Indications: For travellers or people living in areas where infection is endemic.
Contra-indications: Impaired immune response; Hypersensitivity to eggs with evidence of anaphylactic reaction is a contraindication to the vaccine; pregnancy.
Side effects and Precautions
Local and general reactions are not common after vaccination for yellow fever. Very rarely encephalitis has occurred, generally in infants under 9 months of age. Therefore, yellow fever vaccine is not usually given to infants under 9 months..
Headache, fever, tiredness and stiffness may occur 4-7 days after vaccination. Myalgia, asthenia, lymphopathy, rash, uriticia and injection site reaction.
Pregnancy.
Although yellow fever vaccine has been given to women during pregnancy without producing adverse effects in the infants, fetal infection has been reported
Dose: 0.5 ml by SC injection – Immunity start after 10 days and lasts for 10 years.

IMMUNOGLOBULINS

HUMAN NORMAL IMMUNOGLOBULIN (HNIG)

Intramuscular Immunoglobulins

Indications: for prophylaxis of various viral diseases such as hepatitis A, measles and German measles; for therapy in cases of complications of these diseases in high doses.

Contra-indications: avoid administration of live vaccine for 3 months; after administration of live vaccine avoid giving the immunoglobulin for 2-3 weeks.

Side effects and Precautions

Intravenous immunoglobulin preparations should be used with caution in patients with renal impairment.

Immunoglobulin products containing sucrose may be associated with an increased risk of inducing acute renal failure.

Antibody titres for some common pathogens can vary.

Formulations of intravenous immunoglobulins should therefore not be regarded as equivalent.

To be used with caution in patients with risk factors for arterial or venous thrombotic events and in obese individuals.

Dose: It is usually administered IM and never IV usual prophylactic dose by IM injection for adults and children is 0.02-0.04 ml/kg. This usually gives immunological protection for 3 months.

For longer periods of exposure or in areas of high endemicity, the dose is 0.06-0.12 ml/kg, repeated every 4-6 months on continued exposure.

Dose for pregnant women exposed to Rubella for whom therapeutic abortion is unacceptable is 20 ml (2 doses of 5-10 mg separated by a few days).

GLOBUMAN BERNA

Intravenous immunoglobulins

Indications: prophylaxis and treatment of bacterial and viral infections; hypo-and agammaglobulinaemina, transient hypogammaglobulinaemia like during immunosuppressive therapy; virus infections such as herpes, measles, etc; supplementary to antibiotic therapy

in severe bacterial infections; management of idiopathic thrombocytopenic purpura; Guillain-Barre syndrome.
Contra-indications: hypersensitivity to human immunoglobulins.
Side Effects: rise in temperature; cutaneous manifestations or subjective complaints may occur rarely, anaphylactoid reactions are possible.
Dose: according to requirements.

- *Intraglobin 500 mg/Vial*
- *Pentaglobin 5%*

CYTOMEGALOVIRUS (CMV) IMMUNOGLOBULIN

Indications: prophylaxis of clinical manifestations of cytomegalovirus infection in patients subjected to immunosuppressive therapy particularly in transplant recipients.
Cautions: pregnancy and breast-feeding; severe adverse reactions may be related to the rate of infusion. Patients should be observed for at least 20 minutes after administration. Special caution in patient with an amnestic known history of migraine.
Contra-indications: patients intolerant to homologous immunoglobulins.
Side Effects: chills, headache, fever, vomiting, allergic reactions, mild back pain.
Dose: administration should be initiated on the day of transplantation or the day prior to it in case of BMT.
A total of at least 6 doses at 2-3 weeks intervals should be given.

- *Cytotect 100mg Injection*

ANTI-D (RH) IMMUNOGLOBULIN

Indications: Rh-negative women should receive the anti-Rh injection at the earliest possible time after delivery of Rh-positive infant after expulsion of the placenta. Anti-Rh should be injected in cases of abortion as well. Anti-Rh is also used for prophylaxis against immunization following transfusion of wrong Rh-type blood.
Side Effects: In patients given anti-D immunoglobulin for idiopathic thrombocytopenic purpura there have been

rare, but sometimes fatal, cases of intravascular haemolysis.
Anti-D immunoglobulin should not be used in rhesus-positive individuals for prophylaxis of rhesus sensitisation. For the treatment of immune thrombocytopenic purpura, anti-D immunoglobulin is contra-indicated in splenectomised or rhesus-negative patients, in whom the resultant haemolysis may exacerbate pre-existing anaemia.
Dose: by deep IM injection to Rh-negative women following birth of rhesus-positive infant, 500 units immediately or within 72 hours.
Following any potentially sensitizing episode such as stillbirth or abortion up to 20 weeks gestation, 250 units per episode (500 units if after 20 weeks) immediately or within 72 hours.
Following Rh-incompatible blood transfusion, 125 units per ml transfused Rh-positive red cells.

HEPATITIS B IMMUNOGLOBULIN (HBIG)

(HBIG) is available for use in association with the vaccine for the prevention of infection in people accidentally contaminated with hepatitis B virus, and in infants born to mothers who have become infected with this virus in pregnancy or who are high-risk carriers.

RABIES IMMUNOGLOBULIN

Dose: 20 units/kg by IM route and half by infiltration around wound.

TETANUS IMMUNOGLOBULIN

Used for the protection of unimmunised persons when there is a specific risk of tetanus.
Dose: by intramuscular injection, prophylactic 250 units, increased to 500 unit if more than 24 hours have elapsed or there is risk of heavy contamination.
Therapeutic, 30-300 units/kg (multiple sites)

VARICELLA ZOSTER IMMUNOGLOBULIN

Used for protection of immunosuppressed persons and neonates at risk.

Contra-indications: in patients on immunosuppressive therapy, or those with immunodeficiency.

- *Varitect*

15 - ANESTHESIA

GENERAL ANESTHETICS

DRUGS FOR MALIGNANT HYPERTHERMIA

DANTROLENE SODIUM

Indications malignant hyperthermia; chronic severe spasticity of voluntary muscle
Cautions avoid extravasation (risk of tissue necrosis);
Pregnancy: use only if potential benefit outweighs risk
Breast-feeding: present in milk—use only if potential benefit outweighs risk
Side Effects: hepatotoxicity, pulmonary oedema, dizziness, weakness, and injection-site reactions including erythema, rash, swelling, and thrombophlebitis
Dose By rapid intravenous injection, ADULT, initially 2–3 mg/kg, then 1 mg/kg repeated as required to a cumulative max. of 10 mg/kg

- *Dantrium Intravenous Injection, powder for reconstitution, 20-mg vial*

INTRAVENOUS ANESTHETICS

KETAMINE

Indications: sole anesthetic for surgical procedure for two or more hours. For the induction of anesthesia prior to the administration of other general anesthetic agents. Used to supplement low potency agents such as nitrous oxide.
Cautions: hypertension, eclampsia, convulsions, psychiatric diseases.
Contra-indications: in patients with hypertension and is best avoided in those prone to hallucinations or nightmares***;*** porphyria
Side Effects: cardiovascular stimulation, tachycardia, and raised arterial pressure high incidence of hallucinations, nightmares, and other transient psychotic effects
Drug Interactions: barbiturates, diazepam, hydroxyzine, tubocurarine.

Dose: By intramuscular injection, short procedures, initially 6.5–13 mg/kg ***(***10 mg/kg usually produces 12–25 minutes of surgical anaesthesia)
Diagnostic manoeuvres and procedures not involving intense pain, initially 4 mg/kg
By intravenous injection over at least 60 seconds, short procedures, initially 1–4.5 mg/kg ***(***2 mg/kg usually produces 5–10 minutes of surgical anaesthesia)
By intravenous infusion of a solution containing 1 mg/ml, longer procedures, induction, total dose of 0.5–2 mg/kg; maintenance, 10–45 mcg/kg/minute, rate adjusted according to response

- *Ketalar 50 mg/ml-10 ml Injection*

PROPOFOL

Indications: induction and maintenance of general anesthesia
Cautions: monitor blood-lipid concentration if risk of fat overload or if sedation longer than 3 days; may cause anaphylaxis and delayed recovery
Contra-indications: not to be used for sedation of ventilated children and adolescents under 17 years ***(***risk of potentially fatal effects including metabolic acidosis, cardiac failure, rhabdomyolysis, hyperlipidaemia, and hepatomegaly
Side Effects: may cause convulsions, pain on intravenous
injection. flushing; transient apnoea during induction
Dose: Induction by intravenous injection, 2-2.5 mg/kg. Maintenance, by intravenous infusion, 100-200mcg/kg/minute.

- *Diprivan 10 mg/ml Injection 20 ml*

THIOPENTAL SODIUM

Indications: short duration surgical procedures
Cautions: respiratory depression; reconstituted solution is highly alkaline—extravasation causes tissue necrosis and severe pain; avoid intra-arterial injection; cardiovascular disease; hepatic impairment
Contra-indications: myotonic dystrophy***;*** breast-feeding
Side Effects: arrhythmias, myocardial depression, laryngeal spasm, cough, sneezing, hypersensitivity

reactions, rash, injection-site reactions; excessive doses associated with hypothermia and profound cerebral impairment

Dose: by IV injection in fit premedicated adults, initially 100-500 gm (4-6 ml of 2.5% solution) over 10-15 seconds, repeated if necessary according to the patient's response, after 20-30 seconds or up to 4 mg/kg.

Child, induction, 4-8 mg/kg.

By continuous intravenous infusion, as 0.2-0.4% solution, according to the patient's response.

- *Intraval Sodium 2.5% Injection*

INHALATIONAL ANESTHETICS

ISOFLURANE

Indications: induction and maintenance of anesthesia

Side Effects: heart rate may rise, particularly in younger patients; systemic arterial pressure may fall; respiration is depressed.

Dose: using a specifically calibrated vaporizer, induction increased gradually from 0.5% to 3%, in oxygen or nitrous oxide-oxygen.

Maintenance, 1-2.5%

- *Forane 100 ml*

NITROUS OXIDE

Indications: general anesthesia

Cautions: abdominal distention, pneumothorax, encephalography. Special care is needed to avoid hypoxia if an anaesthetic machine is being used; machines should incorporate an anti-hypoxia device. Exposure of patients to nitrous oxide for prolonged periods, either by continuous or by intermittent administration, may result in megaloblastic anaemia owing to interference with the action of vitamin B_{12}. For the same reason, exposure of theatre staff to nitrous oxide should be minimised. Depression of white cell formation may also occur.

Dose: using a suitable anesthetic apparatus, a mixture with 20-30% oxygen for induction and maintenance of light anesthesia.

Analgesia, as a mixture with 50% oxygen according to patient's needs.

SEVOFLURANE

Indications: a rapid acting volatile liquid anaesthetic
Cautions: renal impairment***;*** pregnancy
Contra-indications: susceptibility to malignant hyperthermia
Side Effects: agitation occurs frequently in children
Dose: Using a specifically calibrated vaporiser, *induction*, up to 5% in oxygen or nitrous oxide–oxygen; child up to 7%
Maintenance, 0.5–3%

- *Seroflurane*
- *Sevorane 250 ml*

PREMEDICATION AGENTS

ATROPINE SULFATE

Indications: drying secretions; reversal of excessive bradycardia; with neostigmine for reversal of non-depolarising neuromuscular block; antidote to organophosphorous poisoning, antispasmodic; bradycardia; cardiopulmonary resuscitation***;*** eye
Cautions: cardiovascular disease
Dose: Pre-medication, by IV injection, 300-600 mcg immediately before induction of anesthesia and in incremental doses of 100 mcg for the treatment of bradycardia.
By IM injection, 300 - 600 mcg 30 to 60 minutes before induction.
Child, 20 mcg/kg.
For control of muscarinic side effects of neostigmine in reversal of Competitive neuromuscular block, by IV injection 0.6-1.2 mg.

- *Atropine Sulfate 0.6 mg/ml Injection*

DIAZEPAM

Indications: pre-medication; sedation with amnesia and in conjunction with local anesthetics.
Cautions: neuromuscular disorders, respiratory disease, hepatic dysfunction, renal impairment.
Drug Interactions: Refer to table

Dose: By mouth, 5 mg on night before minor or dental surgery then 5 mg 2 hours before procedure; elderly *(*or debilitated), half adult dose
By intravenous injection, into a large vein 10–20 mg over 2–4 minutes as sedative cover for minor surgical and medical procedures; premedication 100–200 mcg/kg
Pregnancy: Avoid regular use *(*risk of neonatal withdrawal symptoms); use only if clear indication such as seizure control *(*high doses during late pregnancy or labour may cause neonatal hypothermia, hypotonia and respiratory depression)
Breast feeding: Present in milk avoid if possible

- *Valium 10 mg / 2 ml Injection*
- *Valium Tablets 5 mg*

FENTANYL CITRATE

Indications: analgesia; adjunct to general anesthetics; anesthetic for induction and maintenance; neuroleptanalgesia if given with a neuroleptic**.**
Cautions: elderly and debilitated patients; respiratory depression; concomitant administration with opioid premedications and other
CNS - depressant drugs: pregnancy; lactating mothers
Contra-indications: avoid in acute respiratory depression, acute alcoholism and where risk of paralytic ileus; also avoid in raised intracranial pressure or head injury *(*affects pupillary responses vital for neurological assessment); avoid injection in phaeochromocytoma *(*risk of pressor response to histamine release)
Side Effects: respiratory depression; muscular rigidity; hypotension; bradycardia; laryngospasm; nausea and vomiting.
Dose: as analgesic supplement to general anesthesia, low dose 2mcg/kg body weight. In painful minor surgery, 2-20 mcg/kg body weight; In complicated surgery, 20-50 mcg/kg body weight. Supplemental dose of 25-250 mcg may be added according to the needs of the patient and length of surgery. Child, 2-12 years, for induction and maintenance, 2-3 mcg/kg body weight.

- *Fentanyl Injection 50 mcg/ml, 2 ml & 10 ml Vials*
- *Fentanyl Patches 25mcg, 50mcg*

MORPHINE SULFATE

Indications: analgesia during and after operation, enhancement of anesthesia; pre-operative sedation.
Cautions: in head injuries with increased intracranial pressure; in patients with chronic respiratory insufficiency.
Contra-indications: avoid in acute respiratory depression, acute alcoholism and where risk of paralytic ileus; avoid injection in pheochromocytoma
Side Effects: nausea and vomiting ***(***particularly in initial stages), constipation, and drowsiness; larger doses produce respiratory depression, hypotension, and muscle rigidity; other side effects: include difficulty with micturition, ureteric or biliary spasm, dry mouth, sweating, headache, facial flushing, vertigo, bradycardia, tachycardia, palpitation, postural hypotension, hypothermia, hallucinations, dysphoria, mood changes, dependence, miosis, decreased libido or potency, rashes, urticaria and pruritus
Dose: SC or IM injection, up to 10 mg 1-1.5 hours before operation.
Child, by IM injection, 150 mcg/kg.

- *Morphine Injection 10 mg*

PETHIDINE HYDROCHLORIDE

Indications: pre-operative analgesia; pre-medication; analgesia in obstetrics; moderate to severe pain.
Cautions: head injuries, severe hepatic or renal impairment, biliary tract disorders, hypothyroidism; patients exhibiting acute alcoholism, raised intracranial pressure, convulsive disorders. not suitable for severe continuing pain;
Contra-indications: avoid in acute respiratory depression, acute alcoholism and where risk of paralytic ileus; avoid injection in pheochromocytoma***;*** severe renal impairment
Side Effects: nausea and vomiting ***(***particularly in initial stages), constipation, and drowsiness; larger doses produce respiratory depression, hypotension, and muscle rigidity; other side effects: include difficulty with micturition, ureteric or biliary spasm, dry mouth, sweating, headache, facial flushing, vertigo, bradycardia, tachycardia, palpitation, postural hypotension,

hypothermia, hallucinations, dysphoria, mood changes, dependence, miosis, decreased libido or potency, rashes, urticaria and pruritus; convulsions reported in overdosage
Dose: pre-medication, by IM injection, 50-100 mg 1 hour before operation;
Child, l-2mg/kg. Adjunct to nitrous oxide-oxygen, by IV injection, 10-25 mg repeated when required.

- *Pethidine Injection 50 mg/ml & 100 mg/2ml*

PROMETHAZINE HYDROCHLORIDE

Indications: Anti-emetic, pre-operative sedative and anticholinergic agent.
Side Effects: Drowsiness; include headache, psychomotor impairment, and antimuscarinic effects such as urinary retention, dry mouth, blurred vision, and gastro-intestinal disturbances.
Dose: pre-medication, by mouth***:***
Child, 6-12 month, 10 mg; 1-5 years, 15-20 mg; 6-10 years, 20-25 mg.
By deep IM injection, 25-50 mg 1 hour before operation.
Child, 5-10 years, 6.25-12.5 mg.

- *Phenergan Tablet 25mg*
- *Phenergan Injection 50 mg/2 ml*

REMIFENTANIL

Indications: supplementation of general anaesthesia during induction and analgesia during maintenance of anaesthesia ***(*** for use in patients undergoing cardiac surgery); analgesia and sedation in ventilated, intensive care patients
Cautions: in head injuries with increased intracranial pressure; in patients with chronic respiratory insufficiency.
Contra-indications: left ventricular dysfunction; avoid in acute respiratory depression, acute alcoholism and where risk of paralytic ileus; avoid injection in pheochromocytoma
Side Effects: nausea and vomiting ***(***particularly in initial stages), constipation, and drowsiness; larger doses produce respiratory depression, hypotension, and muscle rigidity; other side effects: include difficulty with micturition, ureteric or biliary spasm, dry mouth,

sweating, headache, facial flushing, vertigo, bradycardia, tachycardia, palpitation, postural hypotension, hypothermia, hallucinations, dysphoria, mood changes, dependence, miosis, decreased libido or potency, rashes, urticaria and pruritus; hypertension, hypoxia; very rarely asystole and anaphylaxis

Dose: Induction of anaesthesia, adult and child over 12 years, by intravenous infusion, 0.5–1 mcg/kg/minute, with or without an initial dose by intravenous injection of 0.25–1 mcg/kg over at least 30 seconds. Maintenance of anaesthesia in ventilated patients, adult and child over 12 years, by intravenous infusion, 0.05–2mcg/kg/minute ***(***with or without an initial dose by intravenous injection of 0.25–1 mcg/kg over at least 30 seconds) according to anaesthetic technique and adjusted according to response; in light anaesthesia supplemental doses by intravenous injection every 2–5 minutes.

Maintenance of anaesthesia in spontaneous respiration anaesthesia, adult and child over 12 years, by intravenous infusion, initially 40 nanograms/kg/minute adjusted according to response, usual range 25–100 nanograms/kg/minute.

Maintenance of anaesthesia, child 1–12 years, by intravenous infusion, 0.05–1.3 mcg/kg/minute ***(***with or without an initial dose by intravenous injection of 0.1–1 mcg/kg over at least 30 seconds) according to anaesthetic technique and adjusted according to response

Analgesia and sedation in ventilated, intensive care patients, by intravenous infusion, adult over 18 years initially 100–150 nanograms/kg/minute adjusted according to response in steps of 25 nanograms/kg/minute ***(***allow at least 5 minutes between dose adjustments); usual range 6–740 nanograms/kg/minute; if an infusion rate of 200 nanograms/kg/minute does not produce adequate sedation add another sedative.

Additional analgesia during stimulating or painful procedures in ventilated, intensive care patients, by intravenous infusion, adult over 18 years maintain infusion rate of at least 100 nanograms/kg/minute for at least 5 minutes before procedure and adjust every 2–5 minutes according to requirements, usual range 250–750 nanograms/kg/minute

- *Ultiva 2mg & 5 mg per Vial*

MUSCLE RELAXANTS

ATRACURIUM BESYLATE

Indications: muscle relaxation ***(***short to intermediate duration) for surgery or during intensive care
Cautions: Allergic cross-reactivity between neuromuscular blocking agents**.** Activity is prolonged in patients with myasthenia gravis and in hypothermia, therefore lower doses are required.
Side Effects: are associated with histamine release which can cause skin flushing, hypotension, tachycardia, bronchospasm and rarely, anaphylactoid reactions.
Drug Interactions: inactivated by thiopental and other alkaline solutions.
Dose: by IV injection, initially 300-600 mcg/kg, then 100-200 mcg/kg, repeated as required.
By IV infusion, 5-10 mcg/kg/minute

- *Tracrium 10 mg/ml, 2.5 ml Injection*

CISATRACURIUM BESYLATE

Indications: intermediate-duration, non-depolarising neuromuscular blocking agent for IV use. Used as an adjunct to general anesthesia, or sedation in the Intensive Care Unit (ICU) to relax skeletal muscles and to facilitate tracheal intubation and mechanical ventilation.
Cautions: hypersensitivity to other neuro-muscular blocking agents due to cross-reactivity; myasthenia gravis and other forms of neuromuscular disease.
Dose: In adult intubation, by IV bolus injection, 150mcg/kg.
Maintenance, 30 mcg/kg provides 20 minutes of additional effective neuromuscular block.
Child, 2-12 years, 100 mcg/kg.
Maintenance, 20 mg/kg provides 9 minutes of additional effective neuromuscular block.

- *Nimbex 2 mg/ml -10 ml Ampoules*

MIVACURIUM CHLORIDE

Indications: Non depolarising muscle relaxation ***(***short duration) for surgery
Cautions: low plasma cholinesterase activity; elderly; hepatic impairment***;*** renal impairment cardiovascular

disease; history of greater sensitivity to histamine release and related mediators; neuromuscular disease, obesity; burns; acid-base and serum electrolyte imbalance.
Contra-indications: allergic reactions to the drug or any benzylisoquinolinium agents such as manifested by urticaria, hypotension or severe respiratory distress.
Side Effects: Flushing of the face, neck, and/or chest; hypotension; tachycardia, bradycardia, arrhythmia, phlebitis;
bronchospasm; wheezing, hypoxemia; rash, muscle spasm
Dose: by IV injection, initially 70-150 mcg/kg, then 100mcg/kg every 15 minutes.
Child 2-12 years, initially 100-200 mcg/kg, then 100 mcg/kg every 6-7 minutes.
By IV infusion, maintenance of block, 8-10 mcg/kg/minute adjusted if necessary every 3 minutes by 1 mcg/kg/minute to usualdose of 6-7 mcg/kg/minute.
Child 2-12 years, usual dose 10-15 mcg/kg/minute

- *Mivacron Injection 2 mg/ml - 5 ml Ampoules*

ROCURONIUM BROMIDE

Indications: non-depolarising muscle relaxant of intermediate duration; adjunct in anesthesia to facilitate endotracheal intubation
Cautions: ventilatory support is mandatory for patients until adequate sponatenous respiration is restored. Clinicians should be familiar with early signs of malignant hyperthemia before the start of any anesthesia.
Side Effects: anaphylactic reactions; itching and erythematous reactions at the site of injection; bronchospam and cardiovascular changes.
Dose: endotracheal intubation, 0.6 mg/kg body weight. Maintenance, 0.15 mg/kg body weight.
This should be reduced in long-term inhalational anesthesia to 0.075 - 0.1 mg/kg body weight.
Continuous infusion, a loading dose of 0.6 mg/kg body weight and when the block starts to recover, IV infusion should start. Child, same sensitivity as adults.
Neonates, not recommended

- *Esmeron 10 mg/ml - 5ml Vials*

SUXAMETHONIUM CHLORIDE

Indications: this is a depolarizing muscle-relaxant which is used for short surgical procedures especially in the abdominal region, reposition of fractures and dislocations, endoscopies; laryngo-broncho- and cystoscopies.

Cautions: liver dysfunction***;*** patients with cardiac, respiratory or neuromuscular disease; raised intra-ocular pressure ***(***avoid in penetrating eye injury); severe sepsis (risk of hyperkalaemia);

Contra-indications: family history of malignant hyperthermia, low plasma cholinesterase activity ***(***including severe liver disease***),*** hyperkalaemia; major trauma, severe burns, neurological disease involving acute wasting of major muscle, prolonged immobilisation—risk of hyperkalaemia, personal or family history of congenital myotonic disease, Duchenne muscular dystrophy

Side Effects: postoperative muscle pain, myoglobinuria, myoglobinaemia; tachycardia, arrhythmias, cardiac arrest, hypertension, hypotension; bronchospasm, apnoea, prolonged respiratory depression, anaphylactic reactions; hyperkalaemia; hyperthermia; increased gastric pressure; rash, flushing

Dose: by IV injection, 20-100 mg according to the patient's needs.

Child, initially 1-1.5 mg/kg, then l/3rd of the initial dose. By IV infusion as a 0.1% solution, 2.5 mg/minute ***(***2-5 ml/minute)

- *Scoline 100 mg/2 ml Injection*

ANTI-CHOLINESTERASES USED IN SURGERY

NEOSTIGMINE METHYLSULFATE

Indications Reversal of non-depolarising neuromuscular blockade

Cautions: asthma (extreme caution), bradycardia, arrhythmias, recent myocardial infarction, epilepsy, hypotension, parkinsonism, vagotonia, peptic ulceration, hyperthyroidism, renal impairment

Contra-indications: intestinal or urinary obstruction

Side Effects: nausea, vomiting, increased salivation, diarrhoea, abdominal cramps *(*more marked with higher doses); signs of overdosage include bronchoconstriction, increased bronchial secretions, lacrimation, excessive sweating, involuntary defaecation and micturition, miosis, nystagmus, bradycardia, heart block, arrhythmias, hypotension, agitation, excessive dreaming, and weakness eventually leading to fasciculation and paralysis
Dose: by IV injection, 1-5 mg or 1 mg/20 kg. after or with atropine sulfate 0.6-1.2 mg.
Pregnancy: Antimyasthenics have not been reported to cause birth defects; however, muscle weakness has occurred temporarily in some newborn babies whose mothers took antimyasthenics during pregnancy
Breast feeding: Antimyasthenics have not been reported to cause problems in nursing babies.

- *Prostigmin 2.5 mg/ml Injection*

ANTAGONISTS FOR CENTRAL AND RESPIRATORY DEPRESSION

FLUMAZENIL

Indications: reversal of sedative effects of benzodiazepines in anaesthetic, intensive care, and diagnostic procedures
Cautions: short-acting *(*repeat doses may be necessary benzodiazepine effects may persist for at least 24 hours); benzodiazepine dependence *(*may precipitate withdrawal symptoms); prolonged benzodiazepine therapy for epilepsy *(*risk of convulsions); history of panic disorders (risk of recurrence); ensure neuromuscular blockade cleared before giving; avoid rapid injection in high-risk or anxious patients and following major surgery; hepatic impairment; head injury *(*rapid reversal of benzodiazepine sedation may cause convulsions); elderly, children,
Contra-indications: life-threatening condition (e.g. raised intracranial pressure, status epilepticus) controlled by benzodiazepines
Side Effects: nausea, vomiting, and flushing; if wakening too rapid, agitation, anxiety, and fear; transient increase in blood pressure and heart-rate in intensive care patients; very rarely convulsions (particularly in those

with epilepsy), hypersensitivity reactions including anaphylaxis

Dose: By intravenous injection, 200 mcg over 15 seconds, then 100 mcg at 60-second intervals if required; usual dose range, 300–600 mcg; max. total dose 1 mg (2 mg in intensive care); question aetiology if no response to repeated doses. By intravenous infusion, if drowsiness recurs after injection, 100–400 mcg/hour, adjusted according to level of arousal

- *Anexate 100 mcg/ml Injection 5 ml*

NALOXONE HYDROCHLORIDE

Indications reversal of opioid-induced respiratory depression; reversal of neonatal respiratory depression resulting from opioid administration to mother during labour; overdosage with opioids

Cautions: cardiovascular disease or those receiving cardiotoxic drugs (serious adverse cardiovascular effects reported); physical dependence on opioids (precipitates withdrawal); pain**,** has short duration of action ***(***repeated doses or infusion may be necessary to reverse effects of opioids with longer duration of action); In postoperative use, the dose should be titrated for each patient in order to obtain sufficient respiratory response

Side Effects: hypotension, hypertension, ventricular tachycardia and fibrillation, cardiac arrest; hyperventilation, dyspnea, pulmonary oedema; less commonly agitation, excitement, paraesthesia

Dose: by IV injection, 100-200 mcg (1.5-3mcg/kg). Adjusted according to the response, then 100 mcg every 2 minutes.

Neonates, by SC or IM or IV injection, 10 mcg/kg repeated every 2 minutes or 200 mcg ***(***60 mcg/kg) by IM injection as a single dose.

- *Narcan 0.02mg/ml in 2ml, 0.4 mg/ml In 2ml Ampoules*

DROPERIDOL

Indications: To reduce the incidence of nausea and vomiting associated with surgical and diagnostic procedures.

Cautions: in the presence of risk factors for development of prolonged QT syndrome, such as bradycardia, cardiac disease, Class I and Class III antiarrhythmics, treatment with monoamine oxidase inhibitors (MAOI's), electrolyte imbalance, in particular hypokalemia and hypomagnesemia

Contra-indications: Droperidol is contraindicated in patients with known or suspected QT prolongation

Side Effects: QT interval prolongation, torsade de pointes, cardiac arrest, and ventricular tachycardia; mild to moderate hypotension and tachycardia; include dysphoria, postoperative drowsiness, restlessness, hyperactivity and anxiety

Drug Interactions: Potentially Arrhythmogenic Agents such as class I or III antiarrhythmics, antihistamines that prolong the QT interval, antimalarials, calcium channel blockers, neuroleptics that prolong the QT interval, and antidepressants.

Cautions: should be used when patients are taking concomitant drugs known to induce hypokalemia or hypomagnesemia as they may precipitate QT prolongation and interact with Droperidol. These would include diuretics, laxatives and supraphysiological use of steroid hormones with mineralocorticoid potential.

CNS Depressant Drugs: Other CNS depressant drugs (e.g. barbiturates, tranquilizers, opioids and general anesthetics) have additive or potentiating effects with Droperidol. Following the administration of Droperidol, the dose of other CNS depressant drugs should be reduced.

Dose: Dosage should be individualized;

Adult***:*** The max. recommended initial dose of Droperidol is 2.5 mg IM or slow IV Additional 1.25 mg doses of Droperidol may be administered to achieve the desired effect. However, additional doses should be administered with caution, and only if the potential benefit outweighs the potential risk.

Child***:*** For children two to 12 years of age, the max. recommended initial dose is 0.1 mg/kg, taking into account the patient's age and other clinical factors. However, additional doses should be administered with caution, and only if the potential benefit outweighs the potential risk.

- *Droperidol 2.5 mg/ml In 2 ml Ampoules*

LOCAL ANESTHETICS

BUPIVACAINE HYDROCHLORIDE

Indications: post-operative analgesia, therapeutic pain block, Obstetric anesthesia.
Cautions: epilepsy, hepatic impairment, impaired cardiac conduction, bradycardia.
Dose: Shall be adjusted according to the site of operation and response of patient.
Local infiltration block, up to max. which is 225 mg with epinephrine and 175 mg ***(***or 150 mg in the British System) without epinephrine.
For epidural and caudal block, 25-150 mg, Peripheral nerve block, 12.5 mg max..
Retro bulbar block, 15-30 mg.
Sympathetic block, 50-125 mg.
Spinal anesthesia, heavy preparation 5 mg/ml is used, 2-4ml
The 0.75% strength is contra-indicated for epidural anesthesia in obstetrics. It is recommended to give a test dose of 10-15 mg before epidural use No more than 400 mg should be given daily.

- *Marcaine 0.5% Plain*
- *Marcaine 5 mg/ml With Adrenaline (Epinephrine) 5 mcg/ml Injection*
- *Bupivacaine HCl 5mg/ml spinal heavy 4ml Amp.*

ETHYL CHLORIDE

Indications: local anesthesia by local freezing.

- *Ethyl chloride spray*

LIDOCAINE HYDROCHLORIDE

Indications: local anesthesia by surface, infiltration, regional, epidural, and caudal routes; dental anesthesia
Cautions: epilepsy, respiratory impairment, impaired cardiac conduction, bradycardia, severe shock; porphyria; myasthenia gravis; reduce dose in elderly or debilitated; resuscitative equipment should be available, hepatic impairment

Contra-indications: hypovolaemia, complete heart block; do not use solutions containing adrenaline for anaesthesia in appendages
Side Effects: CNS effects include confusion, respiratory depression and convulsions; hypotension and bradycardia ***(***may lead to cardiac arrest); hypersensitivity reported
Dose: adjusted according to the site of operation and response of the patient. By injection, max. dose 200 mg, or 500 mg with solutions which also contain adrenaline ***(***epinephrine).
Max. dose of adrenaline ***(***epinephrine) 500 mcg.
Infiltration anesthesia, 0.25-0.5% with adrenaline ***(***epinephrine) 1in 200, 000, using 2-50 ml of a 0.5% solution in minor surgery and up to 60 ml in more extensive surgery.
Nerve blocks, with adrenaline ***(***epinephrine) 1 in 200, 000, 1% to a max. of 50 ml, 2% to a max. of 25ml.
Epidural and caudal block, with adrenaline ***(***epinephrine) 1 in 200, 000, 1% to a max. of 50 ml, 2% to a max. of 25 ml. Surface anesthesia, usual strengths 2-4% Mouth, throat, and upper gastro-intestinal tract, max. 200 mg.
Dental procedures, adults, 100-200 mg lidocaine HC1.
Children under 10 years, 20-40 mg lidocaine HC1.

- *Xylocaine 1% injection*
- *Xylocaine 2% injection*
- *Xylocaine 10% spray*
- *Xylocaine gel 2%*
- *Xylocaine 5% ointment*
- *Xylocaine 4% topical solution*

PRILOCAINE HYDROCHLORIDE

Indications: infiltration, regional nerve block and spinal anesthesia and regional intravenous analgesia; dental anesthesia
Cautions: severe or untreated hypertension, severe heart disease; concomitant drugs which cause methaemoglobinaemia; reduce dose in elderly or debilitated; hepatic impairment; renal impairment;
Contra-indications: anaemia or congenital or acquired methaemoglobinaemia
Side Effects: ocular toxicity ***(***including blindness) reported with excessively high strengths used for ophthalmic procedures; in high doses,

methemoglobinaemia may occur which can be treated by intravenous methylene blue 1% injection using a dose of 75-100 mg.

Dose: adjusted according to the site of operation and response of patient, to a max of 400 mg used alone, or 600 mg if used with adrenaline **(**epinephrine) or felypressin.

- *Prilocaine 3% with felypressin dental cartridges.*
- *Emla cream, contains lidocaine 2.5% and prilocaine 2.5%*

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