# Central Medical Supplies Public Corporation

## Medicines Data Sheet

## First Edition

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# Contents

# Abbreviations:

| | |
|---|---|
| **ADHD** | Attention deficit hyperactivity disorder |
| **Amp** | Ampoule |
| **CMS** | Central Medical Supplies Public Corporation |
| **CNS** | Central nervous system |
| **DMARDs** | Disease modifying agents used in rheumatoid disorder |
| **Hcl** | Hydrochloride |
| **Inj** | Injection |
| **LIT** | Litre |
| **NSAIMs**. | Non Steroid Anti Inflammatory Medicines |
| **SDG** | Sudanese Currency |
| **SSRIs** | Selective serotonin re-uptake inhibitors |
| **Tab** | Tablet |
| **WHO** | World Health Organization |

# Acknowledgement

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# Preface:

In many countries availability of quality medicines at affordable price represents one of the major factors regarding the health care system program since health services spend the highest percentage on medicines may be up to 40 %. CMS item list selected mainly from essential drug list and protocols approved by ministry of health. The medicines data sheet aims to provide prescribers, pharmacist, central medical supply client and other health care professionals with sound up to date information about available items, the use of medicines and price indicator about medicines and medical consumable promoted for purchase by the public in Sudan. The medicines data sheet includes key information on the selection, prescribing, dispensing and administration of medicines it is designed as digest of rabid reference and it may not always include the information necessary for prescribing and dispensing. In this book offer detailed comprehensive information about the available items, it contains medicines, consumables, diagnostic agents it contain eighteen sections seventeen of them are medicine each one contain groups and sub group depending on their pharmacological effect, for each item it indicate chemical composition, strength, actions, cautions, dose, main side effects and the price indicator in Sudanese SDG the exact current price can be seen in the revised CMS website (www.cms.gov.sd) includes additional information. Other section for diagnostic agents, there are three appendixes (Consumable, drug - drug interactions and drug during pregnancy). CMS plan for regular update of this book for both items included in the list and the correspondence prices as per the expected changes in the medicine situation in the CMS items list. Comments and suggestions for corrections or changes are very welcome and should be sent to central medical supplies- planning and follow-up department

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## 1-Anaesthesia

### 1.1. General anaesthesia

#### 1.1.1.Volatile drug given by inhalation

#### 1.1.2. Intravenously administered drugs

#### 1.1.3.Antimuscarinic drugs

#### 1.1.4. Neuromscular blocking drugs

### 1.2. Local anaesthesia

#### 1.1.1.Volatile drug given by inhalation

#### 1.1.1.1. Halothane

**Indications:** Is volatile liquid anaesthetic is occasionally used for inhalation induction of anaesthesia with careful monitoring for cardiorespiratory depression and arrhythmias. It is potent, induction is smooth, and the vapour is non-irritant and seldom induces coughing or breath-holding.

**Cautions:** Severe hepatotoxicity can follow halothane anaesthesia. The risk of severe hepatotoxicity appears to be increased by repeated exposures within a short time interval.

**Contra-indications:** In those susceptible to malignant hyperthermia .

**Side-effects:** Increase cerebrospinal pressure and should be used with caution in those with raised intracranial pressure. They can also cause hepatotoxicity in those sensitised to halogenated anaesthetics; halothane has been associated with severe hepatotoxicity.

**Dose:** Induction of anaesthesia, using specifically calibrated vaporiser, in oxygen or nitrous oxide-oxygen,adultandchildover 1 month, initially 0.5% then increased gradually according to response to 2–4%

Maintenance of anaesthesia, using specifically calibrated vaporiser, in oxygen, oxygen-air, or nitrous oxide-oxygen,adultandchildover 1 month, 0.5–2%

**Halothane CMS net price 250ml/bottle = 63.000-66.29 SDG**

#### 1.1.1.2. Isoflurane

**Indication:** Isoflurane is a volatile liquid anaesthetic is the preferred inhalational anaesthetic for use in obstetrics .

**Cautions:** Heart rhythm is generally stable during isoflurane anaesthesia, but heart-rate can rise, particularly in younger patients. Systemic arterial pressure and cardiac output can fall, owing to a decrease in systemic vascular resistance. Muscle relaxation occurs and the effects of muscle relaxant drugs are potentiated.

**Side effects:** Isoflurane can irritate mucous membranes, causing cough, breath-holding, and laryngospasm.

**Dose:** Induction of anaesthesia, using specifically calibrated vaporiser, in oxygen or nitrous oxide-oxygen, increased gradually from 0.5% to 3%. Maintenance of anaesthesia, using specifically calibrated vaporiser, 1–2.5% in nitrous oxide-oxygen; an additional 0.5–1% may be required when given with oxygen alone; caesarean section, 0.5–0.75% in nitrous oxide-oxygen.

**Isoflurane CMS net price 250 ml /bottle =190 SDG**

### 1.1.2. Drugs used for intravenous anaesthesia

may be used either to induce anaesthesia or for maintenance of anaesthesia throughout surgery. Intravenous anaesthetics nearly all produce their effect in one arm-brain circulation time and can cause apnoea and hypotension, and so adequate resuscitative facilities must be available.



#### 1.1.2.1. Etomidate

**Indications:** Induction of anaesthesia

**Cautions:** It produces a high incidence of extraneous muscle movements, which can be minimised by an opioid analgesic or a short-acting benzodiazepine given just before induction. Pain on injection can be reduced by injecting into a larger vein or by giving an opioid analgesic just before induction. Etomidate suppresses adrenocortical function, particularly during continuous administration, and it should not be used for maintenance of anaesthesia.

**Contra-indications:** If the anaesthetist is not confident of being able to maintain the airway (e.g. in the presence of a tumour in the pharynx or larynx). Extreme care is required in surgery of the mouth, pharynx, or larynx and in patients with acute circulatory failure (shock) or fixed cardiac output.

**Dose:** adult and child over 6 months, by slow intravenous injection, 150–300 micrograms/kg; childunder10years may need up to 400 micrograms/kg, elderly 150–200 micrograms/kg.

**Etomidate 2mg/ml I.V CMS net price 10ml amp = 48 SDG**

### 1.1.2.2. Ketamine

**Indications:** Induction and maintenance of anaesthesia.

**Cautions:** Ketamine causes less hypotension than thiopental and propofol during induction. increased cerebrospinal fluid pressure; predisposition to seizures, hallucinations, or nightmares; psychotic disorders; head injury or intracranial mass lesions; thyroid dysfunction; raised intra-ocular pressure.

**Contra-indications:** hypertension, pre-eclampsia or eclampsia, severe cardiac disease, stroke; raised intracranial pressure; head trauma; acute porphyria.

**Side-effects:** Nausea, vomiting; tachycardia, hypertension, arrhythmias, hypotension, bradycardia; hypersalivation, laryngospasm; anxiety, insomnia; diplopia, nystagmus, raised intra-ocular pressure; rash; apnoea and respiratory depression also reported.

**Dose:** Intramuscular injection, short procedures, initially 6.5–13 mg/kg, adjusted according to response (10 mg/kg usually produces 12–25 minutes of surgical anaesthesia).

**Ketamine inj 500 mg/ml CMS net price in 10ml/ vial =6.140**

### 1.1.2.3. Propofol

**Indications:** Induction of anaesthesia.

**Cautions:** Propofol is associated with rapid recovery and less hangover effect than other intravenous anaesthetics. Significant extraneous muscle movements can occur. Rarely, convulsions, anaphylaxis, and delayed recovery from anaesthesia can occur after propofol administration; the onset of convulsions can be delayed.

**Contra-indications:** Inchildren under 16 years receiving intensive care because of the risk of propofol infusion syndrome (potentially fatal effects, including metabolic acidosis, cardiac failure, rhabdomyolysis, hyperlipidaemia, and hepatomegaly); cardiac impairment; respiratory impairment; elderly; hypovolaemia; epilepsy; hypotension; raised intracranial pressure; monitor blood-lipid concentration if risk of fat overload or if sedation longer than 3 days.

**Side-effects:** Hypotension, tachycardia, flushing; transient apnoea, hyperventilation, coughing, and hiccup during induction; headache; less commonly thrombosis, phlebitis; rarely arrhythmia, headache, vertigo, shivering, euphoria; very rarely pancreatitis, pulmonary oedema, sexual disinhibition, and discoloration of urine; serious and sometimes fatal side-effects reported with prolonged infusion of doses exceeding

5 mg/kg/hour, including metabolic acidosis, rhabdomyolysis, hyperkalaemia, and cardiac failure, dystonia and dyskinesia also reported

**Dose:** Induction of anaesthesia using 0.5% *or* 1% injection, by intravenous injection *or* infusion,adultunder 55 years andchildover 12 years, 1.5–2.5 mg/kg at a rate of 20–40 mg every 10 seconds until response;adultover 55 years or debilitated, 1–1.5 mg/kg at a rate of 20 mg every 10 seconds until response;child1 month–12 years, administer slowly until response (usual dose inchildover 8 years 2.5 mg/kg, may need more in youngerchilde.g. 2.5–4 mg/kg). Induction of anaesthesia using 2% injection, by intravenous infusion,adultunder 55 years andchildover 12 years, 1.5–2.5 mg/kg at a rate of 20–40 mg every 10 seconds;adultover 55 years or debilitated, 1–1.5 mg/kg at a rate of 20 mg every 10 seconds until response;child3–12 years, administer slowly until response (usual dose inchildover 8 years 2.5 mg/kg, may need more in youngerchilde.g. 2.5–4 mg/kg). Maintenance of anaesthesia using 1% injection, by intravenous infusion, 4–12 mg/kg/hour (3–6 mg/kg/hour inelderly or debilitated) *or* by intravenous injection, 25–50 mg repeated according to response;child1 month–12 years, by intravenous infusion, 9–15 mg/kg/hour.

Maintenance of anaesthesia using 2% injection, by intravenous infusion, 4–12 mg/kg/hour (3–6 mg/kg/hour inelderly or debilitated);child3–12 years, by intravenous infusion, 9–15 mg/kg/hour.



**Propofol 1% injection (emulsion), CMS net price 10 mg/mL, 20-mL amp = 4.510-7.00 SDG**

### 1.1.2.4. Thiopental sodium

**Indications:** Induction of general anaesthesia; anaesthesia of short duration; reduction of raised intracranial pressure if ventilation controlled; status epilepticus

**Cautions:** Cardiovascular disease; reconstituted solution is highly alkaline—extravasation causes tissue necrosis and severe pain; avoid intra-arterial injection.

**Contra-indications:** acute porphyria myotonic dystrophy

**Side-effects:** hypotension, arrhythmias, myocardial depression, laryngeal spasm, cough, headache, sneezing, hypersensitivity reactions, rash.

**Dose:** Induction of general anaesthesia, by slow intravenous injection usually as a 2.5% (25 mg/mL) solution,adultover 18 years, fit and premedicated, initially 100–150 mg (reduced inelderly or debilitated) over 10–15 seconds (longer inelderly or debilitated), followed by further quantity if necessary according to response after

30–60 seconds; *or* up to 4 mg/kg (max. 500 mg);child1 month–18 years, initially up to 4 mg/kg, then 1 mg/kg repeated as necessary (max. total dose 7 mg/kg)

**Thiopental sodium Injection 500mg / vial/with diluent CMS net price =2.200 SDG**

### 1.1.3.Antimuscarinic drugs

#### 1.1.3.1. Atropine sulphate

**Indications**: Premedication; intra-operative bradycardia; with anticholinesterases for reversal of non-depolarising neuromuscular block; antidote to organophosphorous poisoning); symptomatic relief of gastro-intestinal disorders characterised by smooth muscle spasm bradycardia cardiopulmonary resuscitation cycloplegia, anterior uveitis.

**Cautions:** Antimuscarinics should be used with caution in Down's syndrome, inchildren 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:** Antimuscarinics are contra-indicated in myasthenia gravis (but may be used to decrease muscarinic side-effects of anticholinesterases—paralytic ileus, pyloric stenosis, toxic megacolon, and prostatic enlargement.

**Side-effects:** Side-effects of antimuscarinics include 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.

**Dose:** Adultdose Premedication, by intravenous injection, 300–600 micrograms immediately before induction of anaesthesia. By subcutaneous or intramuscular injection, 300–600 micrograms 30–60 minutes before induction of anaesthesia.

Intra-operative bradycardia, by intravenous injection, 300–600 micrograms (larger doses in emergenciesControl of muscarinic side-effects of neostigmine in reversal of competitive neuromuscular block, by intravenous injection, 0.6–1.2 mg;childunder 12 years, 20 micrograms/kg (max. 1.2 mg)

**Atropine sulphate CMS net price 1mg/ 1-ml ampoule = 0.600 SDG.**

### 1.1.3.2. Hyoscine N-butyl bromide

**Indications**: Premedication; intra-operative bradycardia; with anticholinesterases for reversal of non-depolarising neuromuscular block; antidote to organophosphorous poisoning); symptomatic relief of gastro-intestinal disorders characterised by smooth muscle spasm bradycardia cardiopulmonary resuscitation cycloplegia, anterior uveitis.

**Contra-indications:** Antimuscarinics are contra-indicated in myasthenia gravis (but may be used to decrease muscarinic side-effects of anticholinesterases—paralytic ileus, pyloric stenosis, toxic megacolon, and prostatic enlargement.

**Side-effects:** Side-effects of antimuscarinics include 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.

**Dose:** Premedication, by subcutaneous or intramuscular injection, 200–600 micrograms 30–60 minutes before induction of anaesthesia;child15 micrograms/kg.



**Hyoscine N-butyl bromide 10mg/ 1 ml CMS net price =,0.110 SDG 20mg/1ml injection = 0.540 SDG**

### 1.1.4. Neuromscular blocking drugs

### 1.1.4.1.Pancuronium bromide

**Indications:** Neuromuscular blockade (long duration) for surgery or during intensive care

**Cautions:** Allergic cross-reactivity between neuromuscular blocking drugs has been reported; caution is advised in cases of hypersensitivity to these drugs. Their activity is prolonged in patients with myasthenia gravis and in hypothermia, and lower doses are required. Non-depolarising neuromuscular blocking drugs should be used with great care in those with other neuromuscular disorders and those with fluid and electrolyte disturbances, as response is unpredictable. Resistance can develop in patients with burns, who may require increased doses; low plasma cholinesterase activity in these patients requires dose titration for mivacurium. The rate of administration of neuromuscular blocking drugs should be reduced in patients with cardiovascular disease.

**Side-effects:** Benzylisoquinolinium non-depolarising neuromuscular blocking drugs (except cisatracurium) are associated with histamine release, which can cause skin flushing, hypotension, tachycardia, bronchospasm, and very rarely anaphylactoid reactions. Most aminosteroid neuromuscular blocking drugs produce minimal histamine release. Drugs with vagolytic activity can counteract any bradycardia that occurs during surgery. Acute myopathy has also been reported after prolonged use in intensive care.

**Dose:** adultand childover 1 month, initially 100 micrograms/kg then 20 micrograms/kg as required. Intensive care, by intravenous injection, initially 100 micrograms/kg (optional) then 60 micrograms/kg every 60–90 minutes

**Pancuronium bromide 2mg/1ml for I.V inj. CMS net price 2ml.amp = 2.090-5.540 SDG**

### 1.1.4.2. Suxamethonium chloride

**Indications:** neuromuscular blockade (short duration).

**Cautions:** hypersensitivity to other neuromuscular blocking drugs; 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, 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, low plasma-cholinesterase activity (including severe liver disease, see Hepatic Impairment).

**Side-effects:** Increased gastric pressure; hyperkalaemia; postoperative muscle pain, myoglobinuria, myoglobinaemia; increased intra-ocular pressure; flushing, rash; *rarely* arrhythmias, cardiac arrest; bronchospasm, apnoea, prolonged respiratory depression; limited jaw mobility; *very rarely* anaphylactic reactions, malignant hyperthermia; *also reported* hypertension, hypotension, rhabdomyolysis

**Dose:** By intravenous injection,adult, 1–1.5 mg/kg;childunder 1 year, 2 mg/kg;child1–18 years, 1 mg/k g.

By intramuscular injection (onset in 2–3 minutes),child1 month–1 year, up to 4–5 mg/kg;child1–12 years, up to 4 mg/kg; max. 150 mg.

**suxamethonium chloride 50 mg/mL CMS net price 2-mL amp = 0.900 SDG**

### 1.1.4.3. Rocuronium bromide

**Indications:** Neuromuscular blockade (intermediate duration) for surgery or during intensive care

**Cautions:** Allergic cross-reactivity between neuromuscular blocking drugs has been reported; caution is advised in cases of hypersensitivity to these drugs. Their activity is prolonged in patients with myasthenia gravis and in hypothermia, and lower doses are required. Non-depolarising neuromuscular blocking drugs should be used with great care in those with other neuromuscular disorders and those with fluid and electrolyte disturbances, as response is unpredictable. Resistance can develop in patients with burns, who may require increased doses; low plasma cholinesterase activity in these patients requires dose titration for mivacurium. The rate of administration of neuromuscular blocking drugs should be reduced in patients with cardiovascular disease.

**Side-effects:** Benzylisoquinolinium non-depolarising neuromuscular blocking drugs (except cisatracurium) are associated with histamine release, which can cause skin flushing, hypotension, tachycardia, bronchospasm, and very rarely anaphylactoid reactions. Most aminosteroid neuromuscular blocking drugs produce minimal histamine release. Drugs with vagolytic activity can counteract any bradycardia that occurs during surgery. Acute myopathy has also been reported after prolonged use in intensive care



**Dose:**Intubation,adultand childover 1 month, by intravenous injection, initially 600 micrograms/kg; maintenance by intravenous injection, 150 micrograms/kg (elderly75–100 micrograms/kg) or maintenance by intravenous infusion, 300–600 micrograms/kg/hour

**Rocuronium bromide 10 mg/ml CMS net price 5-mL vial = 22 SDG**

### 1.1.4.4. Vecuronium bromide

**Indications:** Neuromuscular blockade (intermediate duration) for surgery.

**Cautions:** Allergic cross-reactivity between neuromuscular blocking drugs has been reported; caution is advised in cases of hypersensitivity to these drugs. Their activity is prolonged in patients with myasthenia gravis and in hypothermia, and lower doses are required. Non-depolarising neuromuscular blocking drugs should be used with great care in those with other neuromuscular disorders and those with fluid and electrolyte disturbances, as response is unpredictable. Resistance can develop in patients with burns, who may require increased doses; low plasma

cholinesterase activity in these patients requires dose titration for mivacurium. The rate of administration of neuromuscular blocking drugs should be reduced in patients with cardiovascular disease

**Side-effects:** Benzylisoquinolinium non-depolarising neuromuscular blocking drugs (except cisatracurium) are associated with histamine release, which can cause skin flushing, hypotension, tachycardia, bronchospasm, and very rarely anaphylactoid reactions. Most aminosteroid neuromuscular blocking drugs produce minimal histamine release. Drugs with vagolytic activity can counteract any bradycardia that occurs during surgery. Acute myopathy has also been reported after prolonged use in intensive care

**Dose:** Adultandchildover 1 month, by intravenous injection, 80–100 micrograms/kg; then maintenance, by intravenous injection either 20–30 micrograms/kg, adjusted according to response (max. 100 micrograms/kg in caesarian section), or by intravenous infusion, 0.8–1.4 micrograms/kg/minute, adjusted according to response.

**Vecuronium bromide10 mg /vial for I.V inj CMS net price = 11.00 SDG**

### 1.1.4.5. Atracurium Besylate

**Indications:** Neuromuscular blockade (short to intermediate duration) for surgery or during intensive care

**Cautions:** Allergic cross-reactivity between neuromuscular blocking drugs has been reported; caution is advised in cases of hypersensitivity to these drugs. Their activity is prolonged in patients with myasthenia gravis and in hypothermia, and lower doses are required. Non-depolarising neuromuscular blocking drugs should be used with great care in those with other neuromuscular disorders and those with fluid and electrolyte disturbances, as response is unpredictable. Resistance can develop in patients with burns, who may require increased doses; low plasma cholinesterase activity in these patients requires dose titration for mivacurium. The rate of administration of neuromuscular blocking drugs should be reduced in patients with cardiovascular disease

**Side-effects:** Benzylisoquinolinium non-depolarising neuromuscular blocking drugs (except cisatracurium) are associated with histamine release, which can cause skin flushing, hypotension, tachycardia, bronchospasm, and very rarely anaphylactoid reactions. Most aminosteroid neuromuscular blocking drugs produce minimal histamine release. Drugs with vagolytic activity can counteract any bradycardia that occurs during surgery. Acute myopathy has also been reported after prolonged use in intensive care.

**Dose:**Intubation and surgery,adultandchildover 1 month, by intravenous injection, initially 300–600 micrograms/kg, then 100–200 micrograms/kg as required *or* initially by intravenous injection,200–600 micrograms/kg .

Intensive care,adultandchildover 1 month, by intravenous injection, initially 300–600 micrograms/kg (optional) then by intravenous infusion 270–1770 micrograms/kg/hour (usual dose 650–780 micrograms/kg/hour)

**Atracurium Besylate 10 mg/ml for I.V inj CMS net price = 12.00 -21.860 SDG**

## 1.2. Local anaesthesia

**Indications of local anaesthetics:** local anaesthetic drugs act by causing a reversible block to conduction along nerve fibres. They vary widely in their potency, toxicity, duration of action, stability, solubility in water, and ability to penetrate mucous membranes. These factors determine their application, e.g. topical (surface), infiltration, peripheral nerve block, intravenous regional anaesthesia (Bier's block), plexus, epidural (extradural), or spinal (intrathecal or subarachnoid) block. Local anaesthetics may also be used for postoperative pain relief, thereby reducing the need for analgesics such as opioids.



**Cautions of local anaesthetics:** local anaesthetics should be administered with caution inchildren,elderly or debilitated patients (consider dose reduction), or in patients with impaired cardiac conduction, cardiovascular disease, hypovolaemia, shock, impaired respiratory function, epilepsy, or myasthenia gravis.

**Contra-indications of local anaesthetics:** Local anaesthetics should not be injected into inflamed or infected tissues nor should they be applied to damaged skin. In such circumstances, increased absorption into the blood increases the possibility of systemic side-effects, and the local anaesthetic effect may also be reduced by altered local pH .

Local anaesthetics can cause ototoxicity and should not be applied to the middle ear. They are also contra-indicated in patients with complete heart block

**Side-effects:** Toxic effects after administration of local anaesthetics are a result of excessively high plasma concentrations; severe toxicity usually results from inadvertent intravascular injection or too rapid injection.

The systemic toxicity of local anaesthetics mainly involves the central nervous and cardiovascular systems. CNS effects include a feeling of inebriation and lightheadedness followed by sedation, numbness of the tongue and perioral region, restlessness,

paraesthesia (including sensations of hot and cold), dizziness, blurred vision, nausea and vomiting, muscle twitching, tremors, and convulsions. Transient excitation may also occur, followed by depression with drowsiness, respiratory failure, unconsciousness, and coma. Effects on the cardiovascular system include myocardial depression and peripheral vasodilatation resulting in hypotension and bradycardia; arrhythmias and cardiac arrest can occur.

Hypersensitivity reactions occur mainly with the ester-type local anaesthetics such as tetracaine; reactions are less frequent with the amide types such as articaine, bupivacaine, levobupivacaine, lidocaine, mepivacaine, prilocaine, and ropivacaine. Cross-sensitivity reactions may be avoided by using the alternative chemical type.

### 1.2.1 Bupivacaine (as hydrochloride)

Bupivacaine has a longer duration of action than other local anaesthetics. It has a slow onset of action, taking up to 30 minutes for full effect. It is often used in lumbar epidural blockade and is particularly suitable for continuous epidural analgesia in labour, or for postoperative pain relief. It is the principal drug used for spinal anaesthesia. Hyperbaric solutions containing glucose may be used for spinal block.

**Dose:** Local infiltration, max. 60 mL, using a 2.5 mg/mL(0.25%) solution peripheral nerve block, max. 60 mL (150 mg), using a 2.5 mg/mL (0.25%) solution; max. 30 mL, using a 5 mg/mL (0.5%) solution. Epidural block surgery, *lumbar*, 10–20 mL (50–100 mg), using a 5 mg/mL (0.5%) solution Surgery, *caudal*, 15–30 mL (75–150 mg), using a 5 mg/mL (0.5%) solution;child(up to 10 years) using a 2.5 mg/mL (0.25%) solution, up to lower-thoracic (T10) 0.3–0.4 mL/kg (0.75–1 mg/kg), up to mid-thoracic (T6) 0.4–0.8 mL/kg (1–2 mg/kg) Labour, *lumbar*, 6–12 mL (15–30 mg) using a 2.5 mg/mL (0.25%) or 6–12 mL (30–60 mg) using a 5 mg/mL(0.5%) solution Sympathetic block, 20–50 mL (50–125 mg), using a 2.5 mg/mL (0.25%) solution

**Bupivacaine (as hydrochloride) 0.5%+7.5 %Glucose injection CMS net price 4ml/ amp. (SPINAL) = 18.880 SDG**

### 1.2.2.Lidocaine hydrochloride.

Lidocaine is effectively absorbed from mucous membranes and is a useful surface anaesthetic in concentrations up to 10%. Except for surface anaesthesia and dental anaesthesia, solutions should not usually exceed 1% in strength. The duration of the block (with adrenaline) is about 90 minutes.

**Dose:** Infiltration anaesthesia, according to patient's weight and nature of procedure, max. 200 mg (or 500 mg if given in solutions containing adrenaline

**Lidocaine hydrochloride 2%inj CMS net price 20ml = 1.550**

### 1.2.3.Lidocaine hydrochloride 5% Spinal +dextrose 7.5%

**Dose:** Spinal anaesthesia, using 5% solution (with glucose 7.5%),adult, 50–75 mg (1–1.5 ml).

**Lidocaine hydrochloride 5% Spinal +dextrose 7.5% CMS net price 2 ml amp (heavy) =0.970-1.400 SDG**

### 1.2.4.Lidocaine hydrochloride (anhydrous) 2% with adrenaline 1 in 80000 (12.5 mcg /ml ) of adrenaline in cartilage(dental)

Dental cartridge: 2% (hydrochloride) + epinephrine 1:80 000.

**Lidocaine HCl 2% + adrenaline 12.5 mcg/ml(1.8ml) CMS net price dental cartridge =0.920SDG**

## 2- Analgesics, antipyretics, non-steroidal anti-inflammatory medicines (NSAIMS), medicines used to treat gout and disease-modifying agents in rheumatoid disorders (DMARDs)

## 2.1.medicines (NSAIMs)

## 2.2 .Opioid analgesics.

## 2.3.Medicines used to treat gout.

## 2.4.Disease-modifying agents used in rheumatoid disorders (DMARDs).

## 2.1.medicines (NSAIMs)

### 2.1.1.Paracetamol

**Indications:** Mild to moderate pain, pyrexia.

**Side-effects:** Rare, but rashes, blood disorders (including thrombocytopenia, leucopenia, neutropenia) reported; hypotension, flushing, and tachycardia also reported on infusion; important: liver damage (and less frequently renal damage) .

**Dose**: By mouth, 0.5–1 g every 4–6 hours to a max. of 4 g daily;child2 months 60 mg for post-immunisation pyrexia, repeated once after 6 hours if necessary; otherwise under 3 months,3 months–1 year 60–120 mg, 1–6 years 120–250 mg, 6–12 years 250–500 mg; these doses may be repeated every 4–6 hours when necessary (max. of 4 doses in 24 hours).

By intravenous infusion over 15 minutes,adultandchildover 50 kg, 1 g every 4–6 hours, max. 4 g daily;adultandchild10–50 kg, 15 mg/kg every 4–6 hours, max. 60 mg/kg daily; NEONATE andchildless than 10 kg, 7.5 mg/kg every 4–6 hours, max. 30 mg/kg daily

**Paracetamol 500mg tablet CMS net price = 0.040 SDG, Paracetamol 120mg/5ml suspension, 60 ml Bottle = 1.2 SDG**

### 2.1.2.Acetylsalicylic Acid:

**Indications:** Mild to moderate pain, pyrexia; anti platelet.

**Contra-indications:** Children under 16 years (Reye's syndrome); previous or active peptic ulceration, haemophilia .Hypersensitivity aspirin and other NSAIDs are contra-indicated in patients with a history of hypersensitivity to aspirin or any other NSAID—which includes those in whom attacks of asthma, angioedema, urticaria or rhinitis have been precipitated by aspirin or any other NSAID.

**Side-effects:** Generally mild and infrequent but high incidence of gastro-intestinal irritation with slight asymptomatic blood loss, increased bleeding time, bronchospasm and skin reactions in hypersensitive patients. Prolonged administration.

**Dose:** By mouth, 300–900 mg every 4–6 hours when necessary.

By rectum, 450–900 mg every 4 hours (max. 3.6 g daily);childunder 16 years not recommended .

**Acetylsalicylic acid 100mg CMS net price tablet = 0.050 SDG, 300 mg tablets =0.030 SDG**

### 2.1.3.Diclofenac Sodum

**Indications:**Pain and inflammation in rheumatic disease (including juvenile idiopathic arthritis) and other musculoskeletal disorders; acute gout; postoperative pain.

**Contra-indications:** Avoid injections containing benzyl alcohol in neonates.

**Dose:** By mouth, 75–150 mg daily in 2–3 divided doses by rectum in suppositories, 75–150 mg daily in divided doses Juvenile idiopathic arthritis,child6 months–18 years, by mouth. Postoperative pain,child6–12 years, by rectum, 1–2 mg/kg (max. 150 mg) daily in divided doses (12.5 mg and 25 mg suppositories only) for max 4 days.

**Diclofenac sodium 25mg/ml CMS net price 3ml injection = 0.25 SDG, 100mg SR capsule = 0.26 SDG**

### 2.1.4.Ibuprofen

**Indications:** Pain and inflammation in rheumatic disease and other musculoskeletal disorders including juvenile arthritis; mild to moderate pain including dysmenorrhoea and headache; pain inchildren; acute migraine attack.

**Contra-indication:** Hypersensitivity (including asthma, angioedema, urticaria, or rhinitis) to acetylsalicylic acid or any other NSAIM; active peptic ulceration.

**Side effects:** Gastrointestinal disturbances including nausea, diarrhoea, dyspepsia, ulceration, and haemorrhage; hypersensitivity reactions including rash, angioedema and bronchospasm; headache, dizziness, nervousness, depression, drowsiness, insomnia, vertigo, tinnitus, photosensitivity.

**Dose:** Adult andchildover 12 years, initially 300–400 mg 3–4 times daily; increased if necessary to max. 2.4 g daily; maintenance dose of 0.6–1.2 g daily may be adequate.

Pain and fever inchildren,child1–3 months,child3–6 months (body-weight over 5 kg), 50 mg 3 times daily (max. 30 mg/kg daily in 3–4 divided doses);child6 months–1 year, 50 mg 3–4 times daily (max. 30 mg/kg daily in 3–4 divided doses);child1–4 years, 100 mg 3 times daily (max. 30 mg/kg daily in 3–4 divided doses);child4–7 years, 150 mg 3 times daily (max. 30 mg/kg daily in 3–4 divided doses);child7–10 years, 200 mg 3 times daily (up to 30 mg/kg daily (max. 2.4 g) in 3–4 divided doses);child10–12 years, 300 mg 3 times daily (up to 30 mg/kg daily (max. 2.4 g) in 3–4 divided doses).

Rheumatic disease inchildren (including juvenile idiopathic arthritis),child3 months–18 years (body-weight over 5 kg), 30–40 mg/kg (max. 2.4 g) daily in 3–4 divided doses; in systemic juvenile idiopathic arthritis up to 60 mg/kg (max. 2.4 g) daily [unlicensed] in 4–6 divided doses.

**Ibuprofen 200mg tablet CMS net price = 0.038 SDG**

### 2.1.5.Mefenamic acid

**Indications:** Pain and inflammation in rheumatoid arthritis and osteoarthritis; postoperative pain; mild to moderate pain; dysmenorrhoea and menorrhagia.

**Side-effects:** Diarrhoea or rashes (withdraw treatment), stomatitis; less commonly paraesthesia and fatigue; rarely hypotension,palpitation,glucoseintolerance,thrombocytopenia, haemolytic anaemia (positive Coombs' test), and aplastic anaemia.

**Dose:** Adult over 18 years, 500 mg 3 times daily child 12–18 years, acute pain including dysmenorrhoea, menorrhagia, 500 mg 3 times daily.

**Mefenamic acid 250mg tablet CMS net price = 0.05 SDG, 500mg tablet = 0.09 SDG**

## 2.2.Opioid analgesics.

### Cautions of Opioid analgesics.

Opioids should be used with caution in patients with impaired respiratory function (avoid in chronic obstructive pulmonary disease) and asthma (avoid during an acute attack), hypotension, urethral stenosis, shock, myasthenia gravis, prostatic hypertrophy, obstructive or inflammatory bowel disorders, diseases of the biliary tract, and convulsive disorders. Reduced dose is recommended inelderly or debilitated patients, in hypothyroidism, and in adrenocortical insufficiency. Repeated use of opioid analgesics is associated with the development of psychological and physical dependence; although this is rarely a problem with therapeutic use, caution is advised if prescribing for patients with a history of drug dependence. Avoid abrupt withdrawal after long-term treatment. Transdermal preparations (fentanyl or buprenorphine patches) are not suitable for acute

pain or in those patients whose analgesic requirements are changing rapidly because the long time to steady state prevents rapid titration of the dose.

### 2.2.1.Morphine

**Indications:** Severe pain (acute and chronic) myocardial infarction, acute pulmonary oedema; adjunct during major surgery and postoperative analgesia.

**Contraindications:** 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. Third trimester: Depresses neonatal respiration; withdrawal effects in neonates of dependent mothers; gastric stasis and risk of inhalation pneumonia in mother during labour.

**Side-effect: -** Nausea, vomiting (particularly in initial stages), constipation; drowsiness; also dry mouth, anorexia, spasm of urinary and biliary tract; bradycardia, tachycardia, palpitation, euphoria, decreased libido, rash, urticaria, pruritus, sweating, headache, facial flushing, vertigo, postural hypotension, hypothermia, hallucinations, confusion, dependence, miosis; larger doses produce respiratory depression, hypotension, and muscle rigidity.



**Dose:**Acute pain, by subcutaneous injection (not suitable for oedematous patients) or by intramuscular injection,adult, 10 mg every 4 hours if necessary (15 mg for heavier well-muscled patients); Infant up to 1 month, 150 micrograms/kg, 1–12 months, 200 micrograms/kg;child1–5 years, 2.5–5 mg, 6–12 years,5–10 mg. Chronic pain, by mouth (immediate-release tablets) or by subcutaneous injection (not suitable for oedematous patients) or by intramuscular injection,adult, 5–20 mg regularly every 4 hours; dose may be increased according to need oral dose should be approximately double corresponding intramuscular.

By mouth (sustained-release tablets), titrate dose first using immediate release preparation, then every 12 hours according to daily morphine requirement . Myocardial infarction, by slow intravenous injection (2 mg/minute),adult, 10 mg followed by a further 5–10 mg if necessary;elderly or debilitated patients, reduce dose by half. Acute pulmonary oedema, by slow intravenous injection (2 mg/minute),adult, 5–10 mg.

**Morphine sulphate 5 mg tablet CMS net price = 1.13SDG ,15 mg tablet = 1.41 SDG , 30 mg tablet = 0.700 SDG , slow release Tab 30 mg =1.6 00 SDG , 15 mg/ml in 1ml inj = 2.62 SDG.**

**Morphine sulphate 10mg/5 ml in 100 ml solution= New item**

### 2.2.2 Pethidine Hydrochloride:

**Indications:** Moderate to severe pain, obstetric analgesia; peri-operative analgesia.
**Contra-indications:** Should be avoided in patients with acute respiratory depression and when there is a risk of paralytic ileus Comatose patients and in conditions associated with raised intracranial pressure and in head injury.

**Side-effect: -** Nausea, vomiting (particularly in initial stages), constipation; drowsiness; also dry mouth, anorexia, spasm of urinary and biliary tract; bradycardia, tachycardia, palpitation, euphoria, decreased libido, rash, urticaria, pruritus, sweating, headache, facial flushing, vertigo, postural hypotension, hypothermia, hallucinations, confusion, dependence, miosis; larger doses produce respiratory depression, hypotension, and muscle rigidity.

**Dose:** Acute pain, by mouth, 50–150 mg every 4 hours;child0.5–2 mg/kg.By subcutaneous or intramuscular injection, 25–100 mg initially25 mg, repeated after 4 hours. By intramuscular injection, 0.5–2 mg/kg.By slow intraveenous injection, 25–50 mg initially 25 mg), repeated after 4 hours. Obstetric analgesia, by subcutaneous or intramuscular injection, 50–100 mg, repeated 1–3 hours later if necessary; max. 400 mg in 24 hours. Premedication, by intramuscular injection, 25–100 mg 1 hour before operation elderlyor debilitated, 25 mg);child0.5–2 mg/kg.Postoperative pain, by subcutaneous or intramuscular injection, 25–100 mg elderlyor debilitated, initially 25 mg), every 2–3 hours if necessary;child, by intramuscular injection, 0.5–2 mg/kg.

**Pethidine HCl 50mg/ml for inj. CMS net price = 0.830-1.090 SDG**

### 2-2-3 Fentanyl

**Indication:** Severe chronic pain, breakthrough pain; parenteral indications.
**Contra-indications:** Should be avoided in patients with acute respiratory depression and when there is a risk of paralytic ileus Comatose patients and in conditions associated with raised intracranial pressure and in head injury.
**Side-effect: -** Nausea, vomiting (particularly in initial stages), constipation; drowsiness; also dry mouth, anorexia, spasm of urinary and biliary tract; bradycardia, tachycardia, palpitation, euphoria, decreased libido, rash, urticaria, pruritus, sweating, headache, facial flushing, vertigo, postural hypotension, hypothermia, hallucinations, confusion, dependence, miosis; larger doses produce respiratory depression, hypotension, and muscle rigidity. also abdominal pain, dyspepsia, diarrhoea, gastro-oesophageal reflux disease, stomatitis, anorexia, hypertension, vasodilation, dyspnoea, aesthenia, myoclonus, anxiety, tremor, appetite changes, rhinitis, pharyngitis, paraesthesia, application-site reactions; flatulence, hypoventilation, impaired concentration, impaired coordination,

amnesia, speech disorder, malaise, seizures, pyrexia, thirst, blood disorders (including thrombocytopenia), chills; apnoea, haemoptysis, ataxia, delusions, bladder pain.

**Dose**: Consult phsycian specialist in Anaesthesia

**Fentanyl 50mcg/1ml CMS net price 10ml ampoules = 9 SDG**

**2-2-4 Tramadol Hydrochloride:**

**Indications:** Moderate to severe pain.

**Contra-indications:** Should be avoided in patients with acute respiratory depression and when there is a risk of paralytic ileus Comatose patients and in conditions associated with raised intracranial pressure and in head injury.

**Side-effect: -** Nausea, vomiting (particularly in initial stages), constipation; drowsiness; also dry mouth, anorexia, spasm of urinary and biliary tract; bradycardia, tachycardia, palpitation, euphoria, decreased libido, rash, urticaria, pruritus, sweating, headache, facial flushing, vertigo, postural hypotension, hypothermia, hallucinations, confusion, dependence, miosis; larger doses produce respiratory depression, hypotension, and muscle rigidity.

**Dose:** Adult and child over 12 years, by mouth, 50–100 mg not more often than every 4 hours; total of more than 400 mg daily not usually required ,adultandchildover 12 years, by intramuscular injection or by intravenous injection (over 2–3 minutes) or by intravenous infusion, 50–100 mg every 4–6 hours Postoperative pain, 100 mg initially then 50 mg every 10–20 minutes if necessary during first hour to total max. 250 mg (including initial dose) in first hour, then 50–100 mg every 4–6 hours; max. 600 mg daily.

**Tramadol Hydrochloride 50 mg caps CMS net price, 50 mg /ml in 2 ml amp= New item**

## 2.3.Medicines used to treat gout.

### 2.3.1.Allopuainol

**Indications:** Prophylaxis of gout and of uric acid and calcium oxalate renal stones; prophylaxis of hyperuricaemia associated with cancer chemotherapy .

**Contraindications:** Acute gout (if an acute attack occurs while receiving allopurinol, continue prophylaxis and treat attack separately).

**Side-effect:** Hypersensitivity reactions occur rarely and include fever, lymphadenopathy, arthralgia, eosinophilia, erythema multiforme (Stevens-Johnson syndrome) or toxic epidermal

necrolysis, vasculitis, hepatitis, renal impairment and, very rarely, seizures; gastrointestinal disorders; rarely malaise, headache, vertigo, drowsiness, visual and taste disturbances, hypertension, alopecia, hepatotoxicity, paraesthesia, neuropathy, gynaecomastia, and blood disorders (including leukopenia, thrombocytopenia, haemolytic anaemia, and aplastic anaemia.

**Dose:** Prophylaxis of gout, by mouth,adult, initially 100 mg daily as a single dose, preferably after food, then adjusted according to plasma or urinary uric acid concentration (usual maintenance dose in mild conditions, 100–200 mg daily; in moderately severe conditions, 300–600 mg daily; in severe conditions; 700–900 mg daily; doses over 300 mg daily given in divideddoses).

**Allopuainol 100mg tablet CMS net price = 0.100 SDG**

### 2.3.2.Colchicine

**Indications:**Acute gout; short-term prophylaxis during initial therapy with allopurinol and uricosuric drugs; prophylaxis of familial Mediterranean fever (recurrent polyserositis).

**Contraindications:** blood disorders.

**Side-effect:** Nausea, vomiting, and abdominal pain; excessive doses may cause profuse diarrhoea, gastro-intestinal haemorrhage, rash, renal and hepatic damage; rarely peripheral neuritis, inhibition of spermatogenesis, myopathy, alopecia, and with prolonged treatment blood disorders.

**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 cms net price = New item**

## 2.4.Disease-modifying agents used in rheumatoid disorders (DMARDs).

### 2.4.1.Chloroquine

**indication:** Rheumatoid arthritis (including juvenile arthritis); malaria.

**Contraindications:** Psoriatic arthritis.

**cautions:** Monitor visual acuity throughout treatment and warn patient to report immediately any unexplained visual disturbances; hepatic impairment; renal

impairment; neurological disorders including epilepsy; severe gastrointestinal disorders; G6PD deficiency; elderly ; may exacerbate psoriasis and aggravate myasthenia gravis; porphyria;

**Side-effect:** Gastrointestinal disturbances, headache, skin reactions (including rash and pruritus); less frequently ECG changes, convulsions, visual changes, retinal damage, keratopathy, ototoxicity, hair depigmentation, alopecia, and discoloration of skin, nails and mucous membranes; rarely blood disorders (including thrombocytopenia, agranulocytosis, and aplastic anaemia); mental changes (including emotional disturbances, and psychosis), myopathy (including cardiomyopathy and neuromyopathy), acute generalized exanthematous pustulosis, exfoliative dermatitis, erythema multiforme (Stevens-Johnson syndrome), photosensitivity, and hepatic damage; important: arrhythmias and convulsions in overdosage.

**Dose:** Administered on expert advice. Rheumatoid arthritis, by mouth,adult, 150 mg daily; maximum, 2.5 mg/kg daily;child, up to 3 mg/kg daily.

**Chloroquine phosphate 250mg tablet CMS net price = 0.100 SDG**

### 2.4.2.Methotrexate:

**Indication:** Rheumatoid arthritis; malignant disease.

**cautions:** Monitor throughout treatment (including blood counts and hepatic and renal function tests); renal impairment ; hepatic impairment ; reduce dose or withdraw if acute infection develops; advise men and women to use contraception during, and for at least 6 monthsafter, treatment; peptic ulceration, ulcerative colitis, diarrhoea, ulcerative stomatitis; advise patient to avoid self-medication with salicylates or other NSAIMs; warn patient with rheumatoid arthritis to report cough or Dyspnoea. Bone marrow supression. Patients should be warned to report immediately any signs or symptoms of bone marrow suppression, for example, unexplained bruising or bleeding, purpura, infection, or sore throat.

**Contraindications:** Pregnancy Avoid (teratogenic); fertility may be reduced during therapy but this may be reversible; use effective contraception during and for at least 6 months after administration to men or women immunodeficiency syndromes; significant pleural effusion or ascites.

**Side-effect:** Blood disorders (bone marrow suppression), liver damage, pulmonary toxicity; gastrointestinal disturbances if stomatitis and diarrhoea occur, stop treatment; renal failure; skin reactions, alopecia, osteoporosis, arthralgia, myalgia, ocular irritation; precipitation of diabetes.

**Dose:**Rheumatoid arthritis, by mouth,adult, 7.5 mg once weekly (as a single dose or

divided into 3 doses of 2.5 mg given at intervals of 12 hours), adjusted according to response; maximum total dose, 20 mg weekly.

**Methotrexate Sodium 50mg/ 2ml AMP CMS net price = 3.500 SDG**

**Methotrexate Sodium 2.5mg Tablet CMS net price = 0.080 SDG**

### 2.4.3.Sulfasalazine

**Indication:** Severe rheumatoid arthritis; ulcerative colitis and Crohn disease.

**Cautions:** Monitor blood counts and liver function during first 3 months of treatment; monitor renal function regularly; pregnancy; history of allergy; G6PD deficiency; slow acetylator status. Patients should be warned to report immediatelyany signs or symptoms of bone marrow suppression, for example, unexplained bruising or bleeding, purpura, infection, or sore throat.

**Contraindications:** Hypersensitivity to salicylates and sulfonamides; severe renal impairment;childunder 2 years; porphyria.

.**Side-effect:** Nausea, diarrhoea, headache, loss of appetite; fever; blood disorders (including Heinz body anaemia, megaloblastic anaemia, leukopenia, neutropenia, and thrombocytopenia); hypersensitivity reactions (including rash, urticaria, erythema multiforme (Stevens-Johnson syndrome), exfoliative dermatitis, epidermal necrolysis, pruritus, photosensitization, anaphylaxis, serum sickness, interstitial nephritis, and lupus erythematosuslike syndrome); lung complications (including eosinophilia and fibrosing alveolitis); ocular complications (including periorbital oedema); stomatitis, parotitis; ataxia, aseptic meningitis, vertigo, tinnitus, alopecia, peripheral neuropathy, insomnia, depression, hallucinations; renal effects (including proteinuria, crystalluria, and haematuria); oligospermia; rarely acute pancreatitis, hepatitis; urine may be coloured orange; some soft contact lenses may be stained

**Dose:** Rheumatoid arthritis, by mouth (as gastro-resistant tablets),adult, initially 500 mg daily, increased by 500 mg at intervals of 1 week to a maximum of 2–3 g daily in divided doses.

**Sulfasalazine500 mg tablet CMS net price = 0.480 SDG**

## 3-Antiallergics and medicines used in anaphylaxis

### 3.1.Chlorphenamine

**Indication:** Symptomatic relief of allergy, allergic rhinitis (hay fever) and conjunctivitis, urticaria, insect stings, and pruritus of allergic origin; adjunct in the emergency treatment of anaphylactic shock and severe angioedema.

**Cautions:** Prostate enlargement, urinary retention; ileus or pyloroduodenal obstruction; glaucoma;childunder 1 year; epilepsy.

**Side-effect:** Drowsiness (rarely paradoxical stimulation with high doses, or inchildren or the elderly ), hypotension, headache, dizziness, palpitations, psychomotor impairment, urinary retention, dry mouth, blurred vision, gastrointestinal disturbances; liver dysfunction; blood disorders; also rash and photosensitivity reactions, sweating and tremor; hypersensitivity reactions including bronchospasm, angioedema and anaphylaxis; injections may be irritant.

**Dose:** -Allergy, by mouth,adult, 4 mg every 4–6 hours (maximum, 24 mg daily);childunder 1 year, not recommended;child 1–2 years, 1 mg twice daily;child 2–5 years, 1 mg every 4–6 hours (maximum 6 mg daily);child6–12 years, 2 mg every 4–6 hours (maximum 12 mg daily).

Allergic reactions, anaphylaxis (adjunct), by subcutaneous, intramuscular, or intravenous injection,adult, 10–20 mg (maximum 40 mg in 24 hours);child1 month–1 year, 250 micrograms/kg (maximum 2.5 mg);child1–5 years, 2.5–5 mg;child6–12 years, 5–10 mg.

**Chlorpheniramine maleate 4mg tablet CMS net price = 0.060 SDG, 2mg/5ml syrup 100ml = 1.250 SDG , 10mg/ml injection in 1ml = 0.300 SDG**

### 3.2.Epinephrine (adrenaline)

**Indication:** Severe anaphylactic reaction; severe angioedema; cardiac arrest.

**Cautions:** Hyperthyroidism, hypertension, diabetes mellitus, heart disease, arrhythmias, cerebrovascular disease; second stage of labour; elderly .

**Side-effects:** Tachycardia and arrhythmias, hypertension, tremor, anxiety, sweating, nausea, vomiting, weakness, hyperglycaemia, dizziness and pulmonary oedema have all been reported; headache common.

**Dose:** Anaphylaxis, by intramuscular or subcutaneous injection of 1:1000 epinephrine injection, see Steps in the Management of Anaphylaxis for doses. Anaphylaxis, by slow intravenous injection of 1:10 000 epinephrine injection.

**Ephedrine hydrochloride 30mg/1ml CMS net price = 1.200- 1.500 SDG**

### 3.3.Dexamethasone

**Indication**: Adjunct in the emergency treatment of anaphylaxis; short-term suppression of inflammation in allergic disorders.

**Cautions:** Increased susceptibility to, and severity of, infection; activation or exacerbation of tuberculosis, amoebiasis and strongyloidiasis; risk of severe chickenpox in non-immune patients (varicella-zoster immunoglobulin required if exposed to chickenpox); avoid exposure to measles (normal immunoglobulin possibly required if exposed); diabetes mellitus; peptic ulcer; hypertension; corneal perforation; for further precautions relating to long-term use of corticosteroids.

**Contraindications:** Untreated systemic infection (unless condition lifethreatening); administration of live virus vaccines.

**Side-effects:** Nausea, dyspepsia, malaise, hiccups; hypersensitivity reactions including anaphylaxis; perineal irritation after intravenous administration.

**Dose:** Allergy (short-term use), by mouth,adult, usual range 0.5–10 mg daily as a single dose in the morning;child, 10–100 micrograms/kg daily. Anaphylaxis (adjunct), by slow intravenous injection or infusion (as dexamethasone phosphate),adult, 0.5–24 mgchild;, 200–400 micrograms/kg.

**Dexamethasone sodium phosphate 4mg/ml injection CMS net price = 0.290- 0.500 SDG**

### 3.4.Hydrocortisone

**Indication:** Adjunct in the emergency treatment of anaphylaxis; inflammatory skin conditions; inflammatory bowel disease.adrenocortical insufficiency.

**Side effects:** For adverse effects associated with long-term corticosteroid treatment.

**Dose:** Anaphylaxis (adjunct), by slow intravenous injection as a single dose.

**Hydrocortisone Sodium Succinate 100 mg injection CMS net price = 1.56 SDG , Hydrocortisone 10 mg tablet = 0.16 SDG**

### 3.5. Prednisolone

**Indications:** Short-term suppression of inflammation in allergic disorders; longerterm suppression; malignant disease; inflammation of the eye.

**Contraindications:** Untreated systemic infection; administration of live virus vaccines.

**Cautions:** Increased susceptibility to, and severity of, infection; activation or exacerbation of tuberculosis, amoebiasis, and strongyloidiasis; risk of severe chickenpox in non-immune patients (varicella-zoster immunoglobulin required if exposed to chickenpox); avoid exposure to measles (normal immunoglobulin possibly required if exposed); diabetes mellitus; peptic ulcer; hypertension; corneal perforation; for further precautions, in particular, those relating to lowdose long-term use of corticosteroids.

**Side effects:** Nausea, dyspepsia, malaise, hiccups; hypersensitivity reactions including anaphylaxis; for adverse effects associated with long-term corticosteroid treatment

**Dose:** Allergy (short-term use), by mouth, adult and child, initially up to 10–20 mg daily as a single dose in the morning (in severe allergy, up to 60 mg daily as a short course of 5–10 days).

**Prednisolone 5mg Tablet CMS net price = 0.05 SDG**

## 4.1 Hypnotics and anxiolytics

Benzodiazepines are the most commonly used anxiolytics and hypnotics; they act at benzodiazepine receptors which are associated with gamma-aminobutyric acid (GABA) receptors.

### 4.1.1. Diazepam

**Indications:**Short-term use in anxiety or insomnia; adjunct in acute alcohol withdrawal; status epilepticus; febrile convulsions; muscle spasm ; peri-operative use .

**Cautions:** Respiratory disease, muscle weakness and myasthenia gravis, history of drug or alcohol abuse, marked personality disorder; reduce dose inelderly and debilitated; avoid prolonged use (and abrupt withdrawal thereafter); special precautions for intravenous injection; acute 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; 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 reported; skin reactions; on intravenous injection, pain, thrombophlebitis, and rarely apnoea

**Dose:** By mouth, anxiety, 2 mg 3 times daily increased if necessary to 15–30 mg daily in divided doses;elderly (or debilitated) halfadultdose .Insomnia associated with anxiety, 5–15 mg at bedtime.

By intramuscular injection *or* slow intravenous injection (into a large vein, at a rate of not more than 5 mg/minute), for severe acute anxiety, control of acute panic attacks, and acute alcohol withdrawal, 10 mg, repeated if necessary after not less than 4 hours'

**Diazepam 5mg tablet CMS net price = 0.070 SDG ,10 mg/2ml amp = 0.600- 1.080 SDG**

### 4.1.2. Lorazepam

**Indications:** Short-term use in anxiety or insomniastatus epilepticus); peri-operative.

**Cautions:** See under Diazepam; short acting; when given parenterally, facilities for managing respiratory depression with mechanical ventilation must be available.

**Contra-indications:** See under Diazepam

**Side-effects:** See under Diazepam

**Dose:** By mouth, anxiety, 1–4 mg daily in divided doses;elderly (or debilitated) halfadultdose .Insomnia associated with anxiety, 1–2 mg at bedtime;childnot recommended.

By intramuscular *or* slow intravenous injection (into a large vein), acute panic attacks, 25–30 micrograms/kg (usual range 1.5–2.5 mg), repeated every 6 hours if necessary;childnot recommended.

**Lorazepam 1mg tablet CMS net price = New item**

**4mg/ml Injection -1ml amp = = New item**

**2 mg tab = = New item**

## 4.2 Drugs used in psychoses and related disorders

### 4.2.1 Antipsychotic drugs

**Cautions:** Antipsychotic drugs should be used with caution in patients with cardiovascular disease; an ECG may be required (see individual drug monographs),

particularly if physical examination identifies cardiovascular risk factors, if there is a personal history of cardiovascular disease, or if the patient is being admitted as an inpatient. Antipsychotic drugs should also be used with caution in 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. Caution is also required 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). As photosensitisation may occur with higher dosages, patients should avoid direct sunlight. Patients with schizophrenia should have physical health monitoring (including cardiovascular disease risk assessment) at least once per year.

**Contra-indications:** Antipsychotic drugs may be contra-indicated in comatose states, CNS depression, and phaeochromocytoma.

Driving drowsiness may affect performance of skilled tasks (e.g. driving or operating machinery), especially at start of treatment; effects of alcohol are enhanced.

**Side-effects:** Side-effects caused by antipsychotic drugs are common and contribute significantly to non-adherence to therapy.Extrapyramidal symptoms occur most frequently with the piperazine phenothiazines (fluphenazine, perphenazine, prochlorperazine, and trifluoperazine), the butyrophenones (benperidol and haloperidol), and the first-generation depot preparations. They are easy to recognise but cannot be predicted accurately because they depend on the dose, the type of drug, and on individual susceptibility.Sexual dysfunction is one of the main causes of non-adherence to antipsychotic medication; physical illness, psychiatric illness, and substance misuse are contributing factors.Antipsychotic drugs have been associated with cardiovascular side-effects such as tachycardia, arrhythmias, and hypotension . QT-interval prolongation is a particular concern with pimozide and haloperidol. There is also a higher probability of QT-interval prolongation in patients using any intravenous antipsychotic drug, or any antipsychotic drug or combination of antipsychotic drugs with doses exceeding the recommended maximum. Cases of sudden death have occurred.Hyperglycaemia and sometimes diabetes can occur with antipsychotic drugs, particularly clozapine, olanzapine, quetiapine, and risperidone. All antipsychotic drugs may cause weight gain, but the risk and extent varies. Clozapine and olanzapine commonly cause weight gain.Neuroleptic malignant syndrome (hyperthermia, fluctuating level of consciousness, muscle rigidity, and autonomic dysfunction with pallor, tachycardia, labile blood pressure, sweating, and urinary incontinence) is a rare but potentially fatal side-effect of all antipsychotic drugs. Discontinuation of the antipsychotic drug is essential because there is no proven effective treatment, but bromocriptine

and dantrolene have been used. The syndrome, which usually lasts for 5–7 days after drug discontinuation, may be unduly prolonged if depot preparations have been used.Hypersalivation associated with clozapine therapy can be treated with hyoscine hydrobromide [unlicensed indication], provided that the patient is not at particular risk from the additive antimuscarinic side-effects of hyoscine and clozapine.

Other side-effects include: drowsiness; apathy; agitation, excitement and insomnia; convulsions; dizziness; headache; confusion; gastro-intestinal disturbances; nasal congestion; antimuscarinic symptoms (such as dry mouth, constipation, difficulty with micturition, and blurred vision; very rarely, precipitation of angle-closure glaucoma); venous thromboembolism;blood dyscrasias (such as agranulocytosis and leucopenia), photosensitisation, contact sensitisation and rashes, and jaundice (including cholestatic); corneal and lens opacities, and purplish pigmentation of the skin, cornea, conjunctiva, and retina.

### 4.2.1 .1 Chlorpromazine hydrochloride

**Indications**: See under Dose

**Cautions:** See notes above; also diabetes; patients should remain supine, with blood pressure monitoring for 30 minutes after intramuscular injection; dose adjustment may be necessary if smoking started or stopped during treatment

**Contra-indications:** See notes above; hypothyroidism

**Side-effects:** See notes above; also hyperglycaemia

**Dose:** By mouth, schizophrenia and other psychoses, mania, short-term adjunctive management of severe anxiety, psychomotor agitation, excitement, and violent or dangerously impulsive behaviour, initially 25 mg 3 times daily (*or* 75 mg at night), adjusted according to response, to usual maintenance dose of 75–300 mg daily (but up to 1 g daily may be required in psychoses) elderly (or debilitated) third to half adult dose ;child(childhood schizophrenia and autism) 1–6 years 500 micrograms/kg every 4–6 hours (max. 40 mg daily); 6–12 years 10 mg 3 times daily (max. 75 mg daily).Intractable hiccup, 25–50 mg 3–4 times daily. By deep intramuscular injection, (for relief of acute symptoms but see also Cautions and Side-effects), 25–50 mg every 6–8 hours;child 1–6 years 500 micrograms/kg every 6–8 hours (max. 40 mg daily); 6–12 years 500 micrograms/kg every 6–8 hours (max. 75 mg daily).

By rectum in suppositories as chlorpromazine base 100 mg every 6–8 hours [unlicensed].

**Chlorpromazine hydrochloride tablet 25mg CMS net price = 0.090 SDG ,100mg tablet = 0.070 SDG, 50mg/2ml. Amp = 0.28 SDG**

### 4.2.1 .2. Flupentixol

**Indications:** Schizophrenia and other psychoses, particularly with apathy and withdrawal but not mania or psychomotor hyperactivity; depression.

**Cautions:** See notes above; diabetes; avoid in acute porphyria

**Contra-indications:** See notes above; also excitable and overactive patients.

**Side-effects**: See notes above; less sedating but extrapyramidal symptoms frequent; hyperglycaemia.

**Dose:** Psychosis, initially 3–9 mg twice daily adjusted according to the response; max.18 mg daily;elderly (or debilitated) initially quarter to half adult dose;child not recommended

**Flupenthixol decanoate 40mg/2ml inj CMS net price = 36.140 SDG**

### 4.2.1 .3. Haloperidol

**Indications:** See under Dose; motor tics.

Cautions: See notes above; also subarachnoid haemorrhage; metabolic disturbances such as hypokalaemia, hypocalcaemia, or hypomagnesaemia; thyrotoxicosis; arteriosclerosis; dose adjustment may be necessary if smoking started or stopped during treatment.

**Contra-indications:** See notes above; and also QT-interval prolongation (avoid concomitant administration of drugs that prolong QT interval) ; bradycardia.

**Side-effects:** See notes above, but less sedating and fewer antimuscarinic or hypotensive symptoms; pigmentation and photosensitivity reactions rare; depression; weight loss; less commonly dyspnoea, oedema; rarely bronchospasm, hypoglycaemia, and inappropriate antidiuretic hormone secretion; hypertension, sweating, Stevens-Johnson syndrome, and toxic epidermal necrolysis also reported.

**Dose:** Schizophrenia and other psychoses, mania, short-term adjunctive management of psychomotor agitation, excitement, and violent or dangerously impulsive behaviour,adultandchildover 12 years, by mouth, initially 0.5–3 mg 2–3 times daily or 3–5 mg 2–3 times daily in severely affected or resistant patients; in resistant schizophrenia up to 30 mg daily may be needed; adjusted according to response to lowest effective maintenance dose (as low as 5–10 mg daily);elderly (or debilitated) initially halfadultdose.

By intramuscular *or* by intravenous injection,adultover 18 years, initially 2–10 mg, then every 4–8 hours according to response to total max. 18 mg daily; severely disturbed patients may require initial dose of up to 18 mg;elderly (or debilitated) initially halfadultdose.

Agitation and restlessness in the elderly , by mouth, initially 0.5–1.5 mg once or twice daily.

Short-term adjunctive management of severe anxiety, by mouth,adultover 18 years, 500 micrograms twice daily .Motor tics, adjunctive treatment in choreas and Tourette syndrome, by mouth, 0.5–1.5 mg 3 times daily adjusted according to response; 10 mg daily or more may occasionally be necessary in Tourette syndrome;child5–12 years, Tourette syndrome, 12.5–25 microgram/kg twice daily, adjusted according to response up to max. 10 mg daily

Intractable hiccup, by mouth,adultover 18 years, 1.5 mg 3 times daily adjusted according to response .Nausea and vomiting .By intramuscular *or* intravenous injection, 1–2 mg.

**Haloperidol cms net price 5mg /ml 1ml amp = 0.37 - 1.04 SDG**



### 4.2.1 .4. Zuclopenthixol

**Indications:** Short-term management of acute psychosis, mania, or exacerbations of chronic psychosis.

**Cautions:** See notes above; avoid in acute porphyria.

**Contra-indications**: See notes above.

Side-effects: See notes above.

**Dose:** By deep intramuscular injection into the gluteal muscle or lateral thigh, 50–150 mg elderly50–100 mg), if necessary repeated after 2–3 days (1 additional dose may be needed 1–2 days after the first injection); max. cumulative dose 400 mg per course and max. 4 injections; max. duration of treatment 2 weeks—if maintenance treatment necessary change to an oral antipsychotic 2–3 days after last injection, *or* to a longer acting antipsychotic depot injection given concomitantly with last injection of zuclopenthixol acetate; child not recommended.

**Zuclopenthixol decanoate 200mg /ml CMS net price = 28.63 SDG**

### 4.2.1 .5. Fluphenazine decanoate 25mg/ml in 1ml.amp.

**Indications:** Maintenance in schizophrenia and/or other psychoses.

**Cautions:** See notes above; dose adjustment may be necessary if smoking started or stopped during treatment; QT-interval prolongation (avoid concomitant drugs that prolong QT interval)

**Contra-indications:** See notes above; also marked cerebral atherosclerosis

**Side-effects:** See notes above; less sedating and fewer antimuscarinic and/or hypotensive symptoms, but extrapyramidal symptoms, particularly dystonic reactions and akathisia, more frequent; systemic lupuserythematosus, inappropriate antidiuretic hormone secretion, and oedema also reported; extrapyramidal symptoms usually appear a few hours after injection and continue for about 2 days but may be delayed.

**Dose:** By deep intramuscular 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 response;child not recommended.

**Fluphenazine decanoate 25mg/ml CMS net price = 1.653652 SDG**

### 4.2.2. A typical antipsychotic drugs

**Caution and contra-indications of a typical antipsychotic drugs:**While atypical antipsychotic drugs have not generally been associated with clinically significant prolongation of the QT interval, they should be used with care if prescribed with other drugs that increase the QT interval. Atypical antipsychotic drugs should be used with caution in patients with cardiovascular disease, or a history of epilepsy; they should be used with great caution in the elderly .

Driving atypical antipsychotic drugs may affect performance of skilled tasks (e.g. driving); effects of alcohol are enhanced.

**Side-effects:** Side-effects of the atypical antipsychotic drugs include weight gain, dizziness, postural hypotension (especially during initial dose titration) which may be associated with syncope or reflex tachycardia in some patients, extrapyramidal symptoms (usually mild and transient and which respond to dose reduction or to an antimuscarinic drug), and occasionally tardive dyskinesia on long-term administration (discontinue drug on appearance of early signs); venous thromboembolism has been reported. Hyperglycaemia and sometimes diabetes can occur, particularly with clozapine, olanzapine, and risperidone; monitoring weight and plasma-glucose concentration may

identify the development of hyperglycaemia. Neuroleptic malignant syndrome has been reported rarely. Hypersalivation associated with clozapine therapy can be treated with hyoscine hydrobromide [unlicensed indication], provided that the patient is not at particular risk from the additive antimuscarinic side-effects of hyoscine and clozapine.

### 4.2.2. 1 . Clozapine

**Indications:** Schizophrenia (including psychosis in Parkinson's disease) in patients unresponsive to,or intolerant of, conventional antipsychotic drugs.

**Cautions**: See notes above; elderly ; monitor leucocyte and differential blood counts (see Agranulocytosis, below); prostatic hypertrophy, susceptibility to angle-closure glaucoma; taper off other antipsychotics before starting; close medical supervision during initiation (risk of collapse because of hypotension); dose adjustment may be necessary if smoking started or stopped during treatment

**Contra-indications:** Severe cardiac disorders (e.g. myocarditis; see Cautions); history of neutropenia or agranulocytosis (see Cautions); bone-marrow disorders; paralytic ileus (see Cautions); alcoholic and toxic psychoses; history of circulatory collapse; drug intoxication; coma or severe CNS depression; uncontrolled epilepsy.



**Side-effects:** See notes above; also constipation (see Cautions), hypersalivation, dry mouth, nausea, vomiting, anorexia; tachycardia, ECG changes, hypertension; drowsiness, dizziness, headache, tremor, seizures, fatigue, impaired temperature regulation; urinary incontinence and retention; leucopenia, eosinophilia, leucocytosis; blurred vision; sweating; less commonly agranulocytosis (important: see Cautions); rarely dysphagia, hepatitis, cholestatic jaundice, pancreatitis, circulatory collapse, arrhythmia, myocarditis (important: see Cautions), pericarditis, thromboembolism, agitation, confusion, delirium, anaemia; very rarely parotid gland enlargement, intestinal obstruction (see Cautions), cardiomyopathy, myocardial infarction, respiratory depression, priapism, interstitial nephritis, thrombocytopenia, thrombocythaemia, hypertriglyceridaemia, hypercholesterolaemia,hyperlipidaemia, angle-closure glaucoma, fulminant hepatic necrosis, and skin reactions.

**Dose:** Schizophrenia,adultover 16 years, 12.5 mg once or twice elderly12.5 mg once) on first day then 25–50 mg elderly25–37.5 mg) on second day then increased gradually (if well tolerated) in steps of 25–50 mg daily elderlymax. increment 25 mg daily) over 14–21 days up to 300 mg daily in divided doses (larger dose at night, up to 200 mg daily may be taken as a single dose at bedtime); if necessary may be further increased in steps of 50–100 mg once (preferably) or twice weekly; usual dose 200–450 mg daily (max. 900 mg daily).

**Clozapine 100mg scored tablet, 25mg tablet CMS net price = New item**

### 4.2.2. 2 . Olanzapine

**Indications:** See under Dose

**Cautions:** See notes above; 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, Parkinson's disease; dose adjustment may be necessary if smoking started or stopped during treatment.

**Contra-indications:** For injection ,acute myocardial infarction, unstable angina, severe hypotension or bradycardia , sick sinus syndrome, recent heart surgery.

**Side-effects**: See notes above; also mild, transient antimuscarinic effects (very rarely precipitation of angle-closure glaucoma); drowsiness, speech difficulty, exacerbation of Parkinson's disease, abnormal gait, hallucinations, akathisia, asthenia, fatigue, increased appetite, increased body temperature, raised triglyceride concentration, oedema, hyperprolactinaemia (but clinical manifestations uncommon); eosinophilia; less commonly hypotension, bradycardia, QT-interval prolongation, urinary incontinence, and photosensitivity; rarely seizures, leucopenia, and rash; very rarely hepatitis, pancreatitis, thromboembolism, hypercholesterolaemia, hypothermia, urinary retention, priapism, thrombocytopenia, neutropenia, rhabdomyolysis, and alopecia; with injection, sinus pause and hypoventilation

**Dose:** Schizophrenia, combination therapy for mania, preventing recurrence in bipolar disorder, by mouth,adultover 18 years, 10 mg daily adjusted to usual range of 5–20 mg daily; doses greater than 10 mg daily only after reassessment; max. 20 mg daily .

Monotherapy for mania, by mouth,adultover 18 years, 15 mg daily adjusted to usual range of 5–20 mg daily; doses greater than 15 mg only after reassessment; max. 20 mg daily.

Control of agitation and disturbed behaviour in schizophrenia or mania, by intramuscular injection,adultover 18 years, initially 5–10 mg (usual dose 10 mg) as a single dose followed by 5–10 mg after 2 hours if necessary;elderly initially 2.5–5 mg as a single dose followed by 2.5–5 mg after 2 hours if necessary; max. 3 injections daily for 3 days; max. daily combined oral and parenteral dose 20 mg.

**Olanzapine 5mg tablet CMS net price = 0.11 SDG , 10mg tablet =0.21 SDG**

### 4.2.2. 3. .Quetiapine

**Indications:** Schizophrenia; mania, either alone or with mood stabilisers; depression in bipolar disorder; adjunctive treatment in major depressive disorder.

**Cautions:** See notes above; also cerebrovascular disease; patients at risk of aspiration pneumonia; treatment of depression in patients under 25 years (increased risk of suicide).

**Side-effects:** See notes above; also dry mouth, constipation, dyspepsia; tachycardia, hypertension, elevated plasma-triglyceride and -cholesterol concentrations, peripheral oedema; drowsiness, headache, irritability, dysarthria, asthenia; hyperprolactinaemia; leucopenia, neutropenia; blurred vision; rhinitis; less commonly dysphagia, seizures, restless legs syndrome, and eosinophilia; rarely jaundice and priapism; very rarely hepatitis, angioedema, and Stevens-Johnson syndrome; suicidal behaviour (particularly on initiation) also reported.

**Dose:**Schizophrenia,adultover 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;elderly initially 25 mg daily as a single dose, increased in steps of 25–50 mg daily in 2 divided doses.

Treatment of mania in bipolar disorder,adultover 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;elderly initially 25 mg daily as a single dose, increased in steps of 25–50 mg daily in 2 divided doses.

Treatment of depression in bipolar disorder,adultover 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,adultover 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.

**Quetiapine(as fumarate) 100mg tablet CMS net price = 0.122304SDG , 200mg tablet = 0.244608 SDG**

### 4.2.2. 4. .Risperidone

**Indications:** Acute and chronic psychoses, mania; short-term treatment (up to 6 weeks) of persistent aggression in patients with moderate to severe Alzheimer's dementia unresponsive to non-pharmacological interventions and when there is a risk of harm to self or others; short-term treatment (up to 6 weeks) of persistent aggression in conduct disorder (under specialist supervision).

**Cautions**: See notes above; Parkinson's disease; dementia with Lewy bodies; dehydration; avoid in acute porphyria.

**Side-effects:** See notes above; and /or also gastro-intestinal disturbances (including diarrhoea, constipation, nausea and vomiting, dyspepsia, abdominal pain), dry mouth; dyspnoea; drowsiness, asthenia, tremor, sleep disturbances, agitation, anxiety, headache; urinary incontinence; arthralgia, myalgia; abnormal vision; epistaxis; rash; less commonly anorexia, ECG changes, hypoaesthesia, impaired concentration, hyperprolactinaemia, sexual dysfunction, blood disorders, tinnitus, angioedema; rarely intestinal obstruction, pancreatitis, jaundice, seizures, hyponatraemia, abnormal temperature regulation; oedema and priapism also reported.

**Dose:** Psychoses, 2 mg in 1–2 divided doses on first day *then* 4 mg in 1–2 divided doses on second day (slower titration appropriate in some patients); usual dose range 4–6 mg daily; doses above 10 mg daily only if benefit considered to outweigh risk (max. 16 mg daily);elderly initially 500 micrograms twice daily increased in steps of 500 micrograms twice daily to 1–2 mg twice daily.

Mania, initially 2 mg once daily, increased if necessary in steps of 1 mg daily; usual dose range 1–6 mg daily;elderly initially 500 micrograms twice daily increased in steps of 500 micrograms twice daily to 1–2 mg twice daily.

Persistent aggression in Alzheimer's dementia, initially 250 micrograms twice daily, increased according to response in steps of 250 micrograms twice daily on alternate days; usual dose 500 micrograms twice daily (up to 1 mg twice daily has been required).

Persistent aggression in conduct disorder,childover 5 years, body-weight under 50 kg, initially 250 micrograms once daily, increased according to response in steps of 250 micrograms on alternate days; usual dose 500 micrograms daily (up to 750 micrograms once daily has been required);childover 5 years, body-weight over 50 kg, initially 500 micrograms once daily, increased according to response in steps of 500 micrograms on alternate days; usual dose 1 mg daily (up to 1.5 mg once daily has been required)

**Risperidone 2 mg scored tablet CMS net price =, 3 mg scored tablet = New Drug**

### 4.2.3. Antimanic drugs

Antimanic drugs are used to control acute attacks and to prevent recurrence of episodes of mania or hypomania. Long-term treatment of bipolar disorder should continue for at least two years from the last manic episode and up to five years if the patient has risk factors for relapse. An antidepressant drug may also be required

for the treatment of co-existing depression, but should be avoided in patients with rapid-cycling bipolar disorder, a recent history of hypomania, or with rapid mood fluctuations.

### 4.2.3. 1. Lithium

**Indications:** In the prophylaxis and treatment of mania, in the prophylaxis of bipolar disorder (manic-depressive disorder),as concomitant therapy with antidepressant medication in patients who have had an incomplete response to treatment for acute depression in bipolar disorder, and in the prophylaxis of recurrent depression (unipolar illness or unipolar depression). Lithium is also used as an augmenting agent in patients with treatment-resistant depression.In acute mania, lithium should only be used in patients who have responded to lithium before and whose symptoms are not severe.

The decision to give prophylactic lithium usually requires specialist advice, and must be based on careful consideration of the likelihood of recurrence in the individual patient, and the benefit of treatment weighed against the risks. The full prophylactic effect of lithium may not occur for six to twelve months after the initiation of therapy. Olanzapine or valproate (given alone or as adjunctive therapy with lithium) are alternative prophylactic treatments in patients who experience frequent relapses or continued functional impairment.

Long-term use of lithium has been associated with thyroid disorders and mild cognitive and memory impairment. Long-term treatment should therefore be undertaken only with careful assessment of risk and benefit, and with monitoring of thyroid function every 6 months (more often if there is evidence of deterioration). Renal function should be monitored at baseline and every 6 months thereafter (more often if there is evidence of deterioration or if the patient has other risk factors, such as starting ACE inhibitors, NSAIDs, or diuretics). The need for continued therapy should be assessed regularly and patients should be maintained on lithium after 3–5 years only if benefit persists.

**Lithium carbonate 400mg SR tablet CMS net price = 0.136 SDG**

## 4.3 Antidepressant drugs

Antidepressant drugs are effective for treating moderate to severe depression associated with psychomotor and physiological changes such as loss of appetite and sleep disturbance; improvement in sleep is usually the first benefit of therapy. Ideally, patients with moderate to severe depression should be treated with psychological therapy in addition to drug therapy. Antidepressant drugs are also

effective for dysthymia (lower grade chronic depression (typically of at least 2 years duration).

Antidepressant drugs should not be used routinely in mild depression, and psychological therapy should be considered initially; however, a trial of antidepressant therapy may be considered in cases refractory to psychological treatments or those associated with psychosocial or medical problems. Drug treatment of mild depression may also be considered in patients with a history of moderate or severe depression.

### 4.3.1. tricyclic and related antidepressant drugs

**Cautions:** Tricyclic and related antidepressant drugs should be used with caution in patients with cardiovascular disease (see also Contra-indications, below); because of the risk of arrhythmias, patients with concomitant conditions such as hyperthyroidism and phaeochromocytoma should be treated with care. Care is also needed in patients with epilepsy and diabetes. Tricyclic antidepressant drugs have antimuscarinic activity, and therefore caution is needed in patients with prostatic hypertrophy, chronic constipation, increased intra-ocular pressure, urinary retention, or those with a susceptibility to angle-closure glaucoma. Tricyclic and related antidepressant drugs should be used with caution in patients with a significant risk of suicide, or a history of psychosis or bipolar disorder, because antidepressant therapy may aggravate these conditions; treatment should be stopped if the patient enters a manic phase. Elderly patients are particularly susceptible to many of the side-effects of tricyclic antidepressants; low initial doses should be used, with close monitoring, particularly for psychiatric and cardiac side-effects.

**Contra-indications:** Tricyclic and related antidepressants are contra-indicated in the immediate recovery period after myocardial infarction, in arrhythmias (particularly heart block), and in the manic phase of bipolar disorder. Avoid treatment with tricyclic antidepressant drugs in acuteporphyria

**Side-effects:** Arrhythmias and heart block occasionally follow the use of tricyclic antidepressants, particularly amitriptyline, and may be a factor in the sudden death of patients with cardiac disease; other cardiovascular side-effects include postural hypotension, tachycardia, and ECG changes. The tricyclic-related antidepressant drugs may be associated with a lower risk of cardiotoxicity in overdosage.

Central nervous system side-effects are common, particularly in the elderly , and include anxiety, dizziness, agitation, confusion, sleep disturbances, irritability, and paraesthesia; drowsiness is associated with some of the tricyclic antidepressants (see under Choice, below). Convulsions, hallucinations, delusions, mania, and hypomania may occur (see also under Cautions, above), and, rarely, extrapyramidal

symptoms including tremor and dysarthria. Antimuscarinic side-effects include dry mouth, blurred vision (very rarely precipitation of angle-closure glaucoma), constipation (rarely leading to paralytic ileus, particularly in the elderly ), and urinary retention. Tricyclic-related antidepressant drugs have a lower incidence of antimuscarinic side-effects than older tricyclics.

Endocrine effects include breast enlargement, galactorrhoea, and gynaecomastia. Sexual dysfunction may occur. Changes in blood sugar, increased appetite, and weight gain can accompany treatment with tricyclic antidepressant drugs, but anorexia and weight loss are also seen. Hepatic and haematological reactions may occur and have been particularly associated with mianserin. Another side-effect to which theelderly are particularly susceptible is hyponatraemia (see Hyponatraemia and Antidepressant Therapy, Other class side-effects include nausea, vomiting, taste disturbance, tinnitus, rash, urticaria, pruritus, photosensitivity, alopecia, and sweating.

The patient should be encouraged to persist with treatment as some tolerance to these side-effects seems to develop. They are reduced if low doses are given initially and then gradually increased, but this must be balanced against the need to obtain a full therapeutic effect as soon as possible. Neuroleptic malignant syndrome may, very rarely, occur in the course of antidepressant drug treatment.





Suicidal behaviour has been linked with antidepressants.

**Dose:** About 10 to 20% of patients fail to respond to tricyclic and related antidepressant drugs and inadequate dosage may account for some of these failures. It is important to use doses that are sufficiently high for effective treatment but not so high as to cause toxic effects. Low doses should be used for initial treatment in theelderly (see under Side-effects, below). In most patients the long half-life of tricyclic antidepressant drugs allows once-daily administration, usually at night; the use of modified-release

### 4.3 .1.1 Amitriptyline hydrochloride

**Indications:** depressive illness (but not recommended, see notes above); neuropathic pain [unlicensed]; migraine prophylaxis [unlicensed].

**Cautions:** See notes above

**Contra-indications:** See notes above

**Side-effects:** See notes above; also abdominal pain, stomatitis, palpitation, oedema, hypertension, restlessness, fatigue, mydriasis, and increased intra-ocular pressure; high rate of fatality in overdose

**Dose:** Depression (but not recommended, see notes above),adultandchildover 16 years, initially 75 mg elderlyand ADOLESCENTS 30–75 mg) daily in divided doses or as a single dose at bedtime increased gradually as necessary to 150–200 mg.

Neuropathic pain [unlicensed indication], initially 10 mg daily at night, gradually increased if necessary to 75 mg daily; higher doses under specialist supervision.

Migraine prophylaxis [unlicensed indication], initially 10 mg at night, increased if necessary to maintenance of 50–75 mg at night; max. 150 mg at night.

**Amitriptyline hydrochloride 25 mg tablet CMS net price = 0.060 SDG**

### 4.3 .1.2. Clomipramine Hydrochloride

**Indications:** Depressive illness, phobic and obsessional states; adjunctive treatment of cataplexy associated with narcolepsy.

**Cautions:** See notes above

**Contra-indications**: See notes above

**Side-effects:** See notes above; also abdominal pain, diarrhoea, hypertension, flushing, restlessness, fatigue, aggression, impaired memory, muscle weakness, muscle hypertonia, myoclonus, mydriasis, and yawning; very rarely allergic alveolitis.

**Dose:** Depressive illness,adultover 18 years, initially 10 mg daily, increased gradually as necessary to 30–150 mg daily in divided doses or as a single dose at bedtime; max. 250 mg daily;elderly initially 10 mg daily increased carefully over approx. 10 days to 30–75 mg daily. Phobic and obsessional states,adultover 18 years, initially 25 mg daily elderly10 mg daily) increased over 2 weeks to 100–150 mg daily; max. 250 mg daily.

Adjunctive treatment of cataplexy associated with narcolepsy,adultover 18 years, initially 10 mg daily, gradually increased until satisfactory response (range 10–75 mg daily)

**Clomipramine Hydrochloride 25 mg tablet CMS net price = 0.779688 SDG, 25mg/2ml inj = 6.82864 SDG**

### 4.3 .1.3. Imipramine Hydrochloride

**Indications:** Depressive illness; nocturnal enuresis inchildren

**Cautions**: See notes above

**Contra-indications:** See notes above

**Side-effects:** See notes above; also palpitation, flushing, restlessness, headache, fatigue; very rarely abdominal pain, stomatitis, hypertension, oedema, cardiac

decompensation, allergic alveolitis, aggression, myoclonus, peripheral vasospasm, and mydriasis

**Dose:** Depression, initially up to 75 mg daily in divided doses increased gradually to 150–200 mg (up to 300 mg in hospital patients); up to 150 mg may be given as a single dose at bedtime;elderly initially 10 mg daily, increased gradually to 30–50 mg daily;childnot recommended for depression

Nocturnal enuresis,child7–8 years 25 mg, 8–11 years 25–50 mg, over 11 years 50–75 mg at bedtime; max. period of treatment (including gradual withdrawal) 3 months—full physical examination before further course

**Imipramine Hydrochloride 25 mg film coated tablet CMS net price = 0.56056 SDG**

### 4.3. 2.Selective serotonin re-uptake inhibitors

**Cautions:** SSRIs should be used with caution in patients with epilepsy (avoid if poorly controlled, discontinue if convulsions develop), 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. They should also be used with caution in those receiving concurrent electroconvulsive therapy (prolonged seizures reported with fluoxetine). SSRIs may also impair performance of skilled tasks (e.g. driving).

**Contra-indications:** SSRIs should not be used if the patient enters a manic phase.

**Side-effects:** SSRIs are less sedating and have fewer antimuscarinic and cardiotoxic effects than tricyclic antidepressants Side-effects of the SSRIs include gastro-intestinal effects (dose-related and fairly common—include nausea, vomiting, dyspepsia, abdominal pain, diarrhoea, constipation), anorexia with weight loss (increased appetite and weight gain also reported) and 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; other side-effects include dry mouth, nervousness, anxiety, headache, insomnia, tremor, dizziness, asthenia, hallucinations, drowsiness, convulsions (see Cautions above), galactorrhoea, sexual dysfunction, urinary retention, sweating, hypomania or mania (see Cautions above), movement disorders and dyskinesias, visual disturbances, hyponatraemia and bleeding disorders including ecchymoses and purpura. Suicidal behaviour has been linked with antidepressants .

Angle-closure glaucoma may very rarely be precipitated by treatment with SSRIs.

### 4.3. 2.1. Citalopram

**Indications:** Depressive illness, panic disorder

**Cautions:** See notes above; susceptibility to QT-interval prolongation

**Contra-indications**: See notes above

**Side-effects:** See notes above; also hepatitis, palpitation, tachycardia, oedema, bradycardia, postural hypotension, coughing, yawning, confusion, impaired concentration, aggression, malaise, amnesia, migraine, paraesthesia, abnormal dreams, euphoria, mydriasis, taste disturbance, increased salivation, rhinitis, tinnitus, polyuria, micturition disorders, pruritus; paradoxical increased anxiety during initial treatment of panic disorder (reduce dose)

**Dose:** By mouth as tablets, depressive illness, 20 mg once daily increased if necessary in steps of 20 mg daily at intervals of 3–4 weeks; max. 60 mg daily elderlyover 65 years, max. 40 mg daily).

Panic disorder,adultover 18 years, initially 10 mg daily increased gradually if necessary in steps of 10 mg daily, usual dose 20–30 mg daily; max. 60 mg daily elderlyover 65 years, max. 40 mg daily)

By mouth as oral drops, depressive illness, 16 mg daily as a single dose increased if necessary in steps of 16 mg daily at intervals of 3–4 weeks; max. 48 mg daily elderlyover 65 years, max. 32 mg daily

Panic disorder,adultover 18 years, initially 8 mg daily as a single dose increased gradually if necessary in steps of 8 mg, usual dose 16–24 mg daily; max. 48 mg daily elderlyover 65 years, max. 32 mg daily)

**Citalopram (as hydrochloride) 20mg scored tablet CMS net price = 1.12112 SDG**

### 4.3. 2.2. Fluoxetine ( as hydrochloride)

**Indications:** See under Dose

**Cautions:** See notes above

**Contra-indications:** See notes above

**Side-effects:** See notes above; also vasodilatation, postural hypotension, pharyngitis, dyspnoea, chills, taste disturbance, sleep disturbances, euphoria, confusion, yawning, impaired concentration, changes in blood sugar, alopecia, urinary frequency; rarely pulmonary inflammation and fibrosis; very rarely hepatitis, toxic epidermal necrolysis, and neuroleptic malignant syndrome-like event.

**Dose:** Major depression, 20 mg daily increased after 3–4 weeks if necessary, and at appropriate intervals thereafter; max. 60 mg daily elderlyusual max. 40 mg daily

but 60 mg can be used);child8–18 years, 10 mg daily increased after 1–2 weeks if necessary, max. 20 mg daily.

**Fluoxetine Hydrochloride 20 mg capsule CMS net price = New item**

### 4.3. 2.3. . Serteraline

**Indications:** See under Dose

**Cautions:** See notes above

**Contra-indications:** See notes above

**Side-effects:** See notes above; pancreatitis, hepatitis, jaundice, liver failure, stomatitis, palpitation, hypertension, hypercholesterolaemia, tachycardia, postural hypotension, bronchospasm, amnesia, paraesthesia, aggression, hypoglycaemia, hypothyroidism, hyperprolactinaemia, urinary incontinence, menstrual irregularities, leucopenia, and tinnitus also reported

**Dose:** Depressive illness, initially 50 mg daily, increased if necessary by increments of 50 mg at intervals of at least 1 week to max. 200 mg daily; usual maintenance dose 50 mg daily.

Obsessive-compulsive disorder,adultandchildover 12 years initially 50 mg daily, increased if necessary in steps of 50 mg at intervals of at least 1 week; max. 200 mg daily;child6–12 years initially 25 mg daily, increased to 50 mg daily after 1 week, further increased if necessary in steps of 50 mg at intervals of at least 1 week; max. 200 mg daily. Panic disorder, post-traumatic stress disorder, or social anxiety disorder,adultover 18 years, initially 25 mg daily, increased after 1 week to 50 mg daily; if response is partial and if drug tolerated, dose increased in steps of 50 mg at intervals of at least 1 week to max. 200 mg daily

**Serteraline 50mg tablet CMS net price = 0.150842 SDG ,100mg tab = 0.247156 SDG**

### 4.3.4 Other antidepressant drugs

### 4.3.4.1 Mitrazapine

**Indications:** Major depression

**Cautions:** Elderly , 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.

**Side-effects:** increased appetite, weight gain, dry mouth; postural hypotension, peripheral oedema; drowsiness, fatigue, tremor, dizziness, abnormal dreams, confusion, anxiety, insomnia; arthralgia, myalgia; less commonly syncope, hypotension, mania, hallucinations, movement disorders; rarely myoclonus; very rarely blood disorders, convulsions, hyponatraemia

**Dose:** Initially 15–30 mg daily at bedtime increased within 2–4 weeks according to response; max. 45 mg daily as a single dose at bedtime or in 2 divided doses;childunder 18 years not recommended

**Mitrazapine 15 mg tablet CMS net price = New item**

### 4.3.4.2 Venlafaxine HCl

**Indications:** Major depression, generalised anxiety disorder

**Cautions:** Heart disease (monitor blood pressure); diabetes; history of epilepsy; history or family history of mania; susceptibility to angle-closure glaucoma; concomitant use of drugs that increase risk of bleeding, history of bleeding disorders.

**Contra-indications:** Conditions associated with high risk of cardiac arrhythmia, uncontrolled hypertension

**Side-effects:** Constipation, nausea, anorexia, weight changes, vomiting; hypertension, palpitation, vasodilatation, changes in serum cholesterol; chills, yawning; dizziness, dry mouth, insomnia, nervousness, drowsiness, asthenia, headache, abnormal dreams, anxiety, confusion, hypertonia, sensory disturbances, tremor; difficulty with micturition, sexual dysfunction, menstrual disturbances; visual disturbances, mydriasis (very rarely angle-closure glaucoma); sweating; less commonly bruxism, diarrhoea, taste disturbance, postural hypotension, arrhythmias, agitation, apathy, incoordination, hallucinations, myoclonus, angioedema, urinary retention, bleeding disorders (including ecchymosis and gastro-intestinal haemorrhage), tinnitus, alopecia, photosensitivity, and rash; rarely mania, hypomania, seizures, extrapyramidal symptoms including akathisia, urinary incontinence; also reported hepatitis, pancreatitis, hypotension, QT-interval prolongation, aggression, neuroleptic malignant syndrome, delirium, vertigo, syndrome of inappropriate anti-diuretic hormone secretion (hyperprolactinaemia, blood dyscrasias, rhabdomyolysis, pruritus, urticaria, Stevens-Johnson syndrome; suicidal behaviour ).

**Dose:** Depression,adultover 18 years, initially 75 mg daily in 2 divided doses increased if necessary at intervals of at least 2 weeks; max. 375 mg daily;childunder 18 years not recommended

**Venlafaxine HCl 37.5 mg cap CMS net price,75 mg modified release tab = 1.0192 SDG**

## 4.4 CNS stimulants and drugs used for attention deficit hyperactivity disorder

Central nervous system stimulants include the amfetamines (notably dexamfetamine) and related drugs (e.g. methylphenidate). They have very few indications and in particular, should not be used to treat depression, obesity, senility, debility, or for relief of fatigue.

CNS stimulants should be prescribed for children with severe and persistent symptoms of attention deficit hyperactivity disorder (ADHD), when the diagnosis has been confirmed by a specialist;children with moderate symptoms of ADHD can be treated with CNS stimulants when psychological interventions have been unsuccessful or are unavailable. Prescribing of CNS stimulants may be continued by general practitioners, under a shared-care arrangement. Treatment of ADHD often needs to be continued into adolescence, and may need to be continued intoadulthood. Initiating treatment inadulthood is unlicensed.

Drug treatment of ADHD should be part of a comprehensive treatment programme. The choice of medication should take into consideration co-morbid conditions (such as tic disorders, Tourette syndrome, and epilepsy), the adverse effect profile, potential for drug misuse, and preferences of the patient and carers. Methylphenidate and atomoxetine are used for the management of ADHD; dexamfetamine is an alternative inchildren who do not respond to these drugs. Before initiation of drug therapy, and every 6 months thereafter, pulse, blood pressure, weight, and height should be measured.

The need to continue drug treatment for ADHD should be reviewed at least annually. This may involve suspending treatment.

Modafinil is used for the treatment of daytime sleepiness associated with narcolepsy or obstructive sleep apnoea syndrome; dependence with long-term use cannot be excluded and it should therefore be used with caution.

Dexamfetamine and methylphenidate [unlicensed indication] are also used to treat narcolepsy.

### 4.4 .1 Methylphenidate hydrochloride

**Indications:** Attention deficit hyperactivity disorder (under specialist supervision); narcolepsy [unlicensed indication]

**Cautions:** Also monitor for psychiatric disorders; anxiety or agitation; tics or a family history of Tourette syndrome; drug or alcohol dependence; epilepsy (discontinue if

increased seizure frequency); susceptibility to angle-closure glaucoma; avoid abrupt withdrawal

**Contra-indications:** Severe depression, suicidal ideation; anorexia nervosa; psychosis; uncontrolled bipolar disorder; hyperthyroidism; cardiovascular disease (including heart failure, cardiomyopathy, severe hypertension, and arrhythmias), structural cardiac abnormalities; phaeochromocytoma; vasculitis; cerebrovascular disorders

**Side-effects:** Abdominal pain, nausea, vomiting, diarrhoea, dyspepsia, dry mouth, anorexia, reduced weight gain; tachycardia, palpitation, arrhythmias, changes in blood pressure; cough, nasopharyngitis; tics (very rarely Tourette syndrome), insomnia, nervousness, asthenia, depression, irritability, aggression, headache, drowsiness, dizziness, movement disorders; fever; arthralgia; rash, pruritus, alopecia; growth restriction; less commonly constipation, dyspnoea, abnormal dreams, confusion, suicidal ideation, urinary frequency, haematuria, muscle cramps, epistaxis; rarely angina, sweating, and visual disturbances; very rarely hepatic dysfunction, myocardial infarction, cerebral arteritis, psychosis, neuroleptic malignant syndrome, tolerance and dependence, blood disorders including leucopenia and thrombocytopenia, angle-closure glaucoma, exfoliative dermatitis, and erythema multiforme; supraventricular tachycardia, bradycardia, and convulsions also reported

**Dose:** Attention deficit hyperactivity disorder,adultover 18 years [unlicensed use], 5 mg 2–3 times daily increased if necessary at weekly intervals according to response, max. 100 mg daily in 2–3 divided doses;child6–18 years, initially 5 mg 1–2 times daily, increased if necessary at weekly intervals by 5–10 mg daily; usual max. 60 mg daily in 2–3 divided doses but may be increased to 2.1 mg/kg daily in 2–3 divided doses (max. 90 mg daily) under the direction of a specialist; discontinue if no response after 1 month.

**Methylphenidate hydrochloride 10mg scored tablet CMS net price = 0.500 SDG**

## 4.5 Antiepileptic drugs

### 4.5.1. Carbamazepine

**Indications:** Focal and secondary generalised tonic-clonic seizures, primary generalised tonic-clonic seizures; trigeminal neuralgia; prophylaxis of bipolar disorder. unresponsive to lithium; adjunct in acute alcohol withdrawal [unlicensed]; diabetic neuropathy [unlicensed]

**Cautions:** Cardiac disease, history of haematological reactions to other drugs; manufacturer recommends blood counts and hepatic and renal function tests (but evidence of practical value uncertain); may exacerbate absence and myoclonic seizures; consider vitamin D supplementation in patients who are immobilised for long periods or who have inadequate sun exposure or dietary intake of calcium; susceptibility to angle-closure glaucoma; cross-sensitivity reported with oxcarbazepine and with phenytoin; avoid abrupt withdrawal;

**Contraindications:** AV conduction abnormalities (unless paced); history of bone marrow depression, acute porphyria.

**Side-effects:** dry mouth, nausea, vomiting, oedema, ataxia, dizziness, drowsiness, fatigue, headache, hyponatraemia (leading in rare cases to water intoxication), blood disorders (including eosinophilia, leucopenia, thrombocytopenia, haemolytic anaemia, and aplastic anaemia), dermatitis, urticaria; less commonly diarrhoea, constipation, involuntary movements (including nystagmus), visual disturbances; rarely abdominal pain, anorexia, hepatitis, jaundice, vanishing bile duct syndrome, cardiac conduction disorders, hypertension, hypotension, peripheral neuropathy, dysarthria, aggression, agitation, confusion, depression, hallucinations, restlessness, paraesthesia, lymph node enlargement, muscle weakness, systemic lupus erythematosus, delayed multi-organ hypersensitivity disorder; very rarely pancreatitis, stomatitis, hepatic failure, taste disturbance, exacerbation of coronary artery disease, AV block with syncope, circulatory collapse, hypercholesterolaemia, thrombophlebitis, thromboembolism, pulmonary hypersensitivity (with dyspnoea, pneumonitis, or pneumonia), psychosis, neuroleptic malignant syndrome, osteomalacia (see Cautions), osteoporosis, galactorrhoea, gynaecomastia, impaired male fertility, interstitial nephritis, renal failure, sexual dysfunction, urinary frequency, urinary retention, arthralgia, muscle pain, muscle spasm, conjunctivitis, angle-closure glaucoma, hearing disorders, acne, alterations in skin pigmentation, alopecia, hirsutism, sweating, photosensitivity, purpura, Stevens-Johnson syndrome, toxic epidermal necrolysis, aseptic meningitis; suicidal ideation.

**Dose:** Epilepsy, by mouth, initially 100–200 mg 1–2 times daily, increased slowly to usual dose of 0.8–1.2 g daily in divided doses; in some cases 1.6–2 g daily in divided doses may be needed;elderly reduce initial dose;childdaily 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 0.6–1 g.

Trigeminal neuralgia, by mouth, 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 by mouth, initially 400 mg daily in divided doses increased until symptoms controlled; usual range 400–600 mg daily; max. 1.6 g daily.

Treatment of alcohol withdrawal [unlicensed indication], by mouth, initially 800 mg daily in divided doses, reduced gradually over 5 days to 200 mg daily; usual treatment duration 7–10 days.

Diabetic neuropathy [unlicensed indication], by mouth, initially 100 mg 1–2 times daily, increased gradually according to response; usual dose 200 mg 3–4 times daily, up to 1.6 g daily in some patients.

**Carbamazepine 200 mg tablet CMS net price = 0.05- 0.09 SDG**

### 4.5.2.Lamotrigine

**Indications:** Monotherapy and adjunctive treatment of focal seizures and generalised seizures including tonic-clonic seizures; seizures associated with Lennox-Gastaut syndrome; monotherapy of typical absence seizures inchildren; prevention of depressive episodes associated with bipolar disorder

**Cautions:** Closely monitor and consider withdrawal if rash, fever, or other signs of hypersensitivity syndrome develop; avoid abrupt withdrawal (taper off over 2 weeks or longer) unless serious skin reaction occurs; myoclonic seizures (may be exacerbated); Parkinson's disease (may be exacerbated.

**Side-effects:** Nausea, vomiting, diarrhoea, dry mouth, aggression, agitation, headache, drowsiness, dizziness, tremor, insomnia, ataxia, back pain, arthralgia, nystagmus, diplopia, blurred vision, rash (see Skin Reactions, below); movement disorders, unsteadiness, increase in seizure frequency, exacerbation of Parkinson's disease, confusion, hallucination, blood disorders (including anaemia, leucopenia, thrombocytopenia, pancytopenia—see Blood Disorders, above), hypersensitivity syndrome (possibly including rash, fever, facial oedema, lymphadenopathy, hepatic dysfunction, blood disorders, disseminated intravascular coagulation, and multi-organ dysfunction), lupus erythematosus-like reactions; also reported suicidal ideation, aspectic meningitis Skin reactions.

Serious skin reactions including Stevens-Johnson syndrome and toxic epidermal necrolysis have developed (especially inchildren); most rashes occur in the first 8 weeks. Rash is sometimes associated with hypersensitivity syndrome (see Side-effects, above) and is more common in patients with history of allergy or rash from other antiepileptic drugs. Consider withdrawal if rash or signs of hypersensitivity

syndrome develop. Factors associated with increased risk of serious skin reactions include concomitant use of valproate, initial lamotrigine dosing higher than recommended, and more rapid dose escalation than recommended.

**Dose:** Monotherapy of seizures,adultandchildover 12 years, initially 25 mg once daily for 14 days, increased to 50 mg once daily for further 14 days, then increased by max. 100 mg every 7–14 days; usual maintenance 100–200 mg daily in 1–2 divided doses (up to 500 mg daily has been required).

**Lamotrigine25 mg tab CMS net price = New item ,100mg tab = 1.07016 SDG**

### 4.5.3 Phenobarbitone

**Indications:** All forms of epilepsy except typical absence seizures; status epilepticus

**Cautions:** Elderly ; debilitated;children; respiratory depression (avoid if severe); avoid abrupt withdrawal (dependence with prolonged use); history of drug or alcohol abuse; consider vitamin D supplementation in patients who are immobilised for long periods or who have inadequate sun exposure or dietary intake of calcium; avoid in acute porphyria.

**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 theelderly and inchildren; osteomalacia (see Cautions); megaloblastic anaemia (may be treated with folic acid), agranulocytosis, thrombocytopenia; allergic skin reactions; very rarely Stevens-Johnson syndrome and toxic epidermal necrolysis; suicidal ideation.

**Dose:** By mouth, 60–180 mg at night;child5–8 mg/kg daily.

**Phenobarbitone 30mg tablet CMS net price = 0.05 SDG**

### 4.5.4. Phenytoin sodium

**Indications:** All forms of epilepsy except absence seizures; status epilepticus; trigeminal neuralgia if carbamazepine inappropriate.

**Cautions:** Cross-sensitivity reported with carbamazepine; avoid abrupt withdrawal; HLA-B1502 allele in individuals of Han Chinese or Thai origin—avoid unless essential (increased risk of Stevens-Johnson syndrome); manufacturer recommends blood counts (but evidence of practical value uncertain); consider vitamin D

supplementation in patients who are immobilised for long periods or who have inadequate sun exposure or dietary intake of calcium; enteral feeding (interrupt feeding for 2 hours before and after dose; more frequent monitoring may be necessary); avoid in acute porphyria.

**Side-effects:** Nausea, vomiting, constipation, drowsiness, insomnia, transient nervousness, tremor, paraesthesia, dizziness, headache, anorexia; gingival hypertrophy and tenderness (maintain good oral hygiene); rash (discontinue; if mild re-introduce cautiously but discontinue immediately if recurrence), acne, hirsutism, coarsening of facial appearance; rarely hepatotoxicity (discontinue immediately and do not readminister), peripheral neuropathy, dyskinesia, lymphadenopathy, osteomalacia (see Cautions); blood disorders (including megaloblastic anaemia, leucopenia, thrombocytopenia, and aplastic anaemia), polyarteritis nodosa, lupus erythematosus, Stevens-Johnson syndrome, and toxic epidermal necrolysis; also reported polyarthropathy, pneumonitis, and interstitial nephritis; suicidal ideation.

**Dose:** By mouth, initially 3–4 mg/kg daily *or* 150–300 mg daily (as a single dose *or* in 2 divided doses) increased gradually as necessary (with plasma-phenytoin concentration monitoring); usual dose 200–500 mg daily (exceptionally, higher doses may be used);childinitially 5 mg/kg daily in 2 divided doses, usual dose range 4–8 mg/kg daily (max. 300 mg daily).

**Phenytoin sodium 30mg/5ml Susp CMS net price 100 ml bottle = 5.64 SDG , 250mg/5ml amp = 0.85 SDG , 100mg tablet = 0.06 SDG**

### 4.5.5. Sodium valproate

**Indications:** All forms of epilepsy; migraine prophylaxis

**Cautions:** Monitor liver function before therapy and during first 6 months especially in patients most at risk (see also below); measure full blood count and ensure no undue potential for bleeding before starting and before surgery; systemic lupus erythematosus; false-positive urine tests for ketones; avoid abrupt withdrawal; consider vitamin D supplementation in patients that are immobilised for long periods or who have inadequate sun exposure or dietary intake of calcium.

**Contra-indications:** Family history of severe hepatic dysfunction; acute porphyria.

**Side-effects:** Nausea, gastric irritation, diarrhoea; weight gain; hyperammonaemia, thrombocytopenia; transient hair loss (regrowth may be curly); less frequently increased alertness, aggression, hyperactivity, behavioural disturbances, ataxia, tremor, and vasculitis; rarely hepatic dysfunction (see under Cautions; withdraw

treatment immediately if persistent vomiting and abdominal pain, anorexia, jaundice, oedema, malaise, drowsiness, or loss of seizure control), lethargy, drowsiness, confusion, stupor, hallucinations, blood disorders (including anaemia, leucopenia, pancytopenia), hearing loss, and rash; very rarely pancreatitis (see under Cautions), 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; suicidal ideation; reduced bone mineral density (see Cautions); also reported menstrual disturbances.

**Dose:** Epilepsy, by mouth, initially 600 mg daily in 1–2 divided doses, increased gradually (in steps of 150–300 mg) every 3 days; usual maintenance dose 1–2 g daily (20–30 mg/kg daily), max. 2.5 g daily;child1 month–12 years, initially 10–15 mg/kg daily in 1–2 divided doses; usual maintenance dose 25–30 mg/kg daily in 2 divided doses.

Initiation of valproate treatment by intravenous administration,adultandchildover 12 years, initially 10 mg/kg (usually 400–800 mg) by intravenous injection (over 3–5 minutes) followed by intravenous infusion *or* intravenous injection (over 3–5 minutes) in 2–4 divided doses *or* by continuous intravenous infusion up to max. 2.5 g daily; usual range 1–2 g daily (20–30 mg/kg daily);child1 month–12 years, 10 mg/kg by intravenous injection (over 3–5 minutes) followed by intravenous infusion *or* intravenous injection (over 3–5 minutes) in 2–4 divided doses *or* by continuous intravenous infusion up to usual range 20–40 mg/kg daily (doses above 40 mg/kg daily monitor clinical chemistry and haematological parameters).

Continuation of valproate treatment by intravenous injection (over 3–5 minutes) *or* intravenous infusion in 2–4 divided doses, or by continuous intravenous infusion, same as established oral daily dose.

Migraine prophylaxis [unlicensed], by mouth, initially 200 mg twice daily, increased if necessary to 1.2–1.5 g daily in divided doses.

**Sodium valproate 200mg tablet CMS net price = 0.66 SDG , 500mg tablet = 0.91 SDG, 200mg/5ml 300 ml bottle oral suspension = 49.81 SDG**

### 4.5.6 Midazolam Hydrochloride

**Indications:** Conscious sedation for procedures; sedation in intensive care; sedation in anaesthesia; premedication; induction of anaesthesia; status epilepticus

**Cautions:** Cardiac disease; respiratory disease; myasthenia gravis; neonates;children (particularly if cardiovascular impairment); risk of airways obstruction and hypoventilation inchildren under 6 months (monitor respiratory rate and oxygen saturation); history of drug or alcohol abuse; reduce dose inelderly and debilitated; risk of severe hypotension in hypovolaemia, vasoconstriction, hypothermia; avoid prolonged use (and abrupt withdrawal thereafter); concentration of midazolam inchildren under 15 kg not to exceed 1 mg/mL.

**Contra-indications:** 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, convulsions (more common in neonates), dizziness, vertigo, involuntary movements, paradoxical excitement and aggression (especially inchildren and elderly ), dysarthria; urinary retention, incontinence, changes in libido; blood disorders; muscle weakness; visual disturbances; salivation changes; skin reactions; injection-site reactions.

**Dose:** Conscious sedation for procedures, by slow intravenous injection (approx. 2 mg/minute) 5–10 minutes before procedure, initially 2–2.5 mg elderly0.5–1 mg), increased if necessary in steps of 1 mg elderly0.5–1 mg); usual total dose 3.5–5 mg (max. 7.5 mg),elderly max. 3.5 mg.

Sedative in combined anaesthesia, by intravenous injection, 30–100 micrograms/kg repeated as required or by continuous intravenous infusion, 30–100 micrograms/kg/hour elderlylower doses needed);childnot recommended.

Premedication, by deep intramuscular injection,adultover 18 years, 70–100 micrograms/kg elderlyor debilitated 25–50 micrograms/kg) 20–60 minutes before induction.

By intravenous injection,adultover 18 years, 1–2 mg 5–30 minutes before procedure, repeated as required elderlyor debilitated 0.5 mg, repeat dose slowly as required).

Induction (but rarely used), by slow intravenous injection, 150–200 micrograms/kg elderlyor debilitated 50–150 micrograms/kg) given in divided doses (max. 5 mg) at intervals of 2 minutes; max. total dose 600 micrograms/kg;child7–18 years initially 150 micrograms/kg (max. 7.5 mg) given in steps of 50 micrograms/kg (max. 2.5 mg) over 2–5 minutes; wait for 2–5 minutes then give additional doses of 50

micrograms/kg (max. 2.5 mg) every 2 minutes if necessary; max. total dose 500 micrograms/kg (not exceeding 25 mg).

Sedation of patients receiving intensive care, by slow intravenous injection, initially 30–300 micrograms/kg given in steps of 1–2.5 mg every 2 minutes, then by slow intravenous injection or by continuous intravenous infusion, 30–200 micrograms/kg/hour; reduce dose (or reduce or omit initial dose) in hypovolaemia, vasoconstriction, or hypothermia; lower doses may be adequate if opioid analgesic.

**Midazolam hydrochloride 5mg/ml for inj CMS net price 3ml = 8.08 SDG**

## 4.6 Drugs used in parkinsonism and related disorders

### 4.6 .1.Levodopa + carbidopa

**Indications:** All forms of parkinsonism other than drug-induced.

**Contraindications:** Concurrent use of monoamine oxidase inhibitors; angleclosure glaucoma; confirmed or suspected malignant melanoma

**Side-effects:** Nausea, anorexia, and vomiting, particularly at the start of treatment; postural hypotension at the start of treatment, particularly in theelderly and those receiving antihypertensives; excessive drowsiness and sudden onset of sleep (warn patient of these effects); confusion, vivid dreams, dizziness, tachycardia, arrhythmias; reddish discoloration of body fluids; insomnia, headache, flushing, gastrointestinal bleeding, peripheral neuropathy; taste disturbances, pruritus, rash, liver enzyme changes; psychiatric symptoms including psychosis, depression, and hallucinations; delusions and neurological disturbances including dyskinesias (may be doselimiting) painful dystonic spasms ("end-of-dose" effects) and ("on-off" effects) after prolonged treatment (see note above); neuroleptic malignant syndrome (on sudden withdrawal); rarely hypersensitivity.

**Dose:** Parkinsonism, by mouth,adult, expressed in terms of levodopa, initially 100 mg (with carbidopa 10 mg) twice daily, increased by 100 mg (with carbidopa 10 mg) every few days as necessary, to a maximum of levodopa 1.5 g.

**Levodopa+Carbidopa100+10 (as monohydrate) mg tablets CMS net price = 0.336 SDG**
**Levodopa ,250 + Carbidopa (as anhydrous) 25mg = 0.60 SDG**

### 4.6 .2. Trihexyphenidyl HCl

**Indications:** Parkinsonism; drug-induced extrapyramidal symptoms (but not tardive dyskinesia

**Cautions:** Antimuscarinics should be used with caution in cardiovascular disease, hypertension, psychotic disorders, prostatic hypertrophy, pyrexia, in those susceptible to

angle-closure glaucoma, and in the elderly . Antimuscarinics should not be withdrawn abruptly in patients taking long-term treatment. Antimuscarinics are liable to abuse

**Contra-indications:** Antimuscarinics should be avoided in gastro-intestinal obstruction and myasthenia gravis. use only if potential benefit outweighs risk

**Side-effects:** Side-effects of antimuscarinics include constipation, dry mouth, nausea, vomiting, tachycardia, dizziness, confusion, euphoria, hallucinations, impaired memory, anxiety, restlessness, urinary retention, blurred vision, and rash. Angle-closure glaucoma occurs very rarely.

**Dose:** 1 mg daily, increased by 2 mg every 3–5 days according to response; usual maintenance dos

**Trihexyphenidyl HCl 2mg Tablet CMS net price = 0.13 SDG**

### 4.6 .3.Procyclidine HCL

**Indications:** Parkinsonism; drug-induced extrapyramidal symptoms (but not tardive dyskinesia

Cautions: Antimuscarinics should be used with caution in cardiovascular disease, hypertension, psychotic disorders, prostatic hypertrophy, pyrexia, in those susceptible to angle-closure glaucoma, and in the elderly . Antimuscarinics should not be withdrawn abruptly in patients taking long-term treatment. Antimuscarinics are liable to abuse

**Contra-indications:** Antimuscarinics should be avoided in gastro-intestinal obstruction and myasthenia gravis. use only if potential benefit outweighs risk

**Side-effects:** Side-effects of antimuscarinics include constipation, dry mouth, nausea, vomiting, tachycardia, dizziness, confusion, euphoria, hallucinations, impaired memory, anxiety, restlessness, urinary retention, blurred vision, and rash. Angle-closure glaucoma occurs very rarely.

**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.

By intramuscular *or* intravenous injection, acute dystonia, 5–10 mg (occasionally more than 10 mg), usually effective in 5–10 minutes but may need 30 minutes for relief;elderly preferably lower end of range.

**Procyclidine HCL 5 mg/ml for inj. CMS net price =New item**

## 5.1.Antianginal medicines

### 5.1.1.Glyceryl trinitrate

**Indication:** Prophylaxis and treatment of angina.

**Contraindications:** Hypersensitivity to nitrates; hypotension; hypovolaemia; hypertrophic obstructive cardiomyopathy, aortic stenosis, cardiac tamponade, constrictive pericarditis, mitral stenosis; marked anaemia; head trauma; cerebral haemorrhage; angle-closure glaucoma.

**Side effect:** Throbbing headache; flushing; dizziness, postural hypotension; tachycardia; paradoxical bradycardia also reported.

**Dose:** Angina (acute attack), sublingually,adult, 0.5–1 mg, repeated as required.

**Nitroglycerine 5mg ml for inj. CMS net price 5ml = 6.8 SDG**

### 5.1.2.Isosorbide dinitrate

**Indication:** Prophylaxis and treatment of angina; heart failure.

**Contraindications:** Hypersensitivity to nitrates; hypotension; hypovolaemia; hypertrophic obstructive cardiomyopathy, aortic stenosis, cardiac tamponade, constrictive pericarditis, mitral stenosis; marked anaemia; head trauma; cerebral haemorrhage; angle-closure glaucoma.

**Side effects:** Throbbing headache; flushing; dizziness, postural hypotension; tachycardia; paradoxical bradycardia also reported.

**Dose:** angina (acute attack), sublingually,adult, 2.5–10 mg, repeated as required.

Angina prophylaxis, by mouth,adult, 20–240 mg daily in divided doses.

**Isosorbid dinitrate10mg tablet CMS net price = 0.400 SDG**

### 5.1.3.Verapamil

**Indication:** Angina, including stable, unstable, and Prinzmetal; arrhythmias ; migraine prophylaxis .

**Contraindications:** Hypotension, bradycardia, second- and third-degree atrioventricular block, sinoatrial block, sick sinus syndrome; cardiogenic shock; history of heart failure or significantly impaired left ventricular function (even if controlled by therapy); atrial flutter or fibrillation complicating Wolff-Parkinson-White syndrome; porphyria.

**Side effects:** Constipation; less commonly nausea, vomiting, flushing, headache, dizziness, fatigue, and ankle oedema; rarely allergic reactions including pruritus, urticaria, angioedema, and erythema multiforme (Stevens-Johnson syndrome); myalgia, arthralgia, paraesthesia, erythromelalgia; increased prolactin concentration; gynaecomastia and gingival hyperplasia on long-term treatment; hypotension, heart failure, bradycardia, heart block, and asystole (due to negative inotropic effect) with high doses.

**Dose:** Angina, by mouth,adult, 80–120 mg 3 times daily (120 mg 3 times daily usually required in Prinzmetal angina).

**Verapamil HCL 2.5mg for inj. CMS net price Ampoule = 19.570 SDG**

## 5.2.Antiarrhythmic medicines

### 5.2.1.Atenolol

**Indication:** Arrhythmias; angina and mycocardial infarction; hypertension ; migraine prophylaxis.

**Contraindications:** History of asthma or bronchospasm (unless no alternative, in which case, use with extreme caution and under specialist supervision); uncontrolled heart failure, Prinzmetal angina, marked bradycardia, hypotension, sick sinus syndrome, second- and third-degree atrioventricular block, cardiogenic shock; metabolic acidosis; severe peripheral arterial disease; phaeochromocytoma (unless used with an alpha-blocker).

**Side effects:** Gastrointestinal disturbances including nausea, vomiting, diarrhoea, constipation, and abdominal cramp; fatigue; cold hands and feet; exacerbation of intermittent claudication and Raynaud phenomenon; bronchospasm; bradycardia, heart failure, conduction disorders, hypotension; sleep disturbances including nightmares; depression, confusion; hypoglycaemia or hyperglycaemia; exacerbation of psoriasis.

**Dose:** Arrhythmias, by mouth,adult, 50 mg once daily, increased if necessary to 50 mg twice daily or 100 mg once daily.

**Atenolol 50mg tablet CMS net price = 0.03 SDG**

### 5.2.2.Digoxin

**Indication:** Supraventricular arrhythmias, particularly atrial fibrillation; heart failure

**Contraindications:** Hypertrophic obstructive cardiomyopathy (unless also atrial fibrillation and heart failure); Wolff-Parkinson-White syndrome or other accessory pathway, particularly if accompanied by atrial fibrillation; ventricular tachycardia or fibrillation; intermittent complete heart block; second-degree atrioventricular block.

**Side effects:** Usually only associated with high doses; gastrointestinal disturbances including anorexia, nausea, vomiting, diarrhoea, and abdominal pain; visual disturbances, headache, fatigue, drowsiness, confusion, dizziness, delirium, hallucinations, depression; arrhythmias, heart block; rarely rash, and intestinal ischaemia; gynaecomastia on long-term use; thrombocytopenia reported.

**Dose:** Atrial fibrillation, by mouth,adult, initially 1–1.5 mg in divided doses over 24 hours for rapid digitalization (or 250 micrograms once or twice daily if digitalization less urgent) followed by: 62.5–500 micrograms daily (higher dose may be divided), according to renal function and heart rate response; usual maintenance dose, 125–250 micrograms daily (lower dose more appropriate in the elderly ). Emergency control of atrial fibrillation, by intravenous infusion over at least 2 hours,adult, 0.75–1 mg.

**Digoxin 0.25mg tablet CMS net price = 0.35 SDG , 0.25 mg/ml in 2ml Ampule = 17.00 SDG**

### 5.2.3.Adenosine

**Indications:** Rapid reversion to sinus rhythm of paroxysmal supraventricular tachycardias, including those associated with accessory conducting pathways (e.g.

Wolff-Parkinson-White syndrome); aid to diagnosis of broad or narrow complex supraventricular tachycardias

**Contra-indications:** Second- or third-degree AV block and sick sinus syndrome (unless pacemaker fitted); long QT syndrome; severe hypotension; decompensated heart failure; chronic obstructive lung disease (including asthma)

**Side-effects:** Nausea; arrhythmia (discontinue if asystole or severe bradycardia occur), sinus pause, AV block, flushing, angina (discontinue), dizziness; dyspnoea; headache; less commonly metallic taste; palpitation, hyperventilation, weakness, blurred vision, sweating; very rarely transient worsening of intracranial hypertension, bronchospasm, injection-site reactions; also reported vomiting, syncope, hypotension (discontinue if severe), cardiac arrest, respiratory failure (discontinue), and convulsions.

**Dose:** By rapid intravenous injection into central or large peripheral vein, 6 mg over 2 seconds with cardiac monitoring; if necessary followed by 12 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 at any particular dose.



**Adenosine CMS net price = New item**

### 5.2.4.Amiodarone:

**Indication:** Arrhythmias, particularly when other drugs are ineffective or contra-indicated. It can be used for paroxysmal supraventricular, nodal and ventricular tachycardias, atrial fibrillation and flutter, and ventricular fibrillation. tachyarrhythmias associated with Wolff-Parkinson-White syndrome.

**Contra indication:** Sinus bradycardia, sino-atrial heart block; unless pacemaker fitted avoid in severe conduction disturbances or sinus node disease; thyroid dysfunction; iodine sensitivity; avoid intravenous use in severe respiratory failure, circulatory collapse, or severe arterial hypotension; avoid bolus injection in congestive heart failure or cardiomyopathy.

**Side-effects:** Nausea, vomiting, taste disturbances, raised serum transaminases (may require dose reduction or withdrawal if accompanied by acute liver disorders), jaundice; bradycardia (; pulmonary toxicity (including pneumonitis and fibrosis); tremor, sleep disorders; hypothyroidism, hyperthyroidism; reversible corneal microdeposits (sometimes with night glare); phototoxicity, persistent slate-grey skin discoloration , injection-site reactions; less commonly onset or worsening of arrhythmia, conduction disturbances, peripheral neuropathy and myopathy (usually

reversible on withdrawal); very rarely chronic liver disease including cirrhosis, sinus arrest, bronchospasm (in patients with severe respiratory failure), ataxia, benign intracranial hypertension, headache, vertigo, epididymo-orchitis, impotence, haemolytic or aplastic anaemia, thrombocytopenia, rash (including exfoliative dermatitis), hypersensitivity including vasculitis, alopecia, impaired vision due to optic neuritis or optic neuropathy (including blindness), anaphylaxis on rapid injection, also hypotension, respiratory distress syndrome, sweating, and hot flushes

**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 arrhythmia.

By intravenous infusion, initially 5 mg/kg over 20–120 minutes with ECG monitoring; subsequent infusion given if necessary according to response up to max. 1.2 g in 24 hours Ventricular fibrillation or pulseless ventricular tachycardia refractory to defibrillation.

**Amiodarone hydrochloride 50mg/ml for inj. CMS net price 3ml Ampoule= 1.80 - 2.00 SDG**

## 5.3.Antihypertensive medicines

### 5.3.1.Amlodipine

**Indication:** Hypertension, angina.

**Contraindications:** Cardiogenic shock, unstable angina, significant aortic stenosis.

**Side effects:** Abdominal pain, nausea; palpitation, flushing, oedema; headache, dizziness, sleep disturbances, fatigue; less commonly gastrointestinal disturbances, dry mouth, taste disturbances, hypotension, syncope, chest pain, dyspnoea, rhinitis, mood changes, tremor, paraesthesia, increased sweating, urinary disturbances, impotence, gynaecomastia, weight changes, myalgia, arthralgia, muscle cramps, visual disturbances, tinnitus, pruritus, rash (including isolated reports of erythema multiforme), alopecia, purpura, and skin discoloration; very rarely gastritis, pancreatitis, hepatitis, jaundice, cholestasis, gingival hyperplasia, myocardial infarction, arrhythmias, vasculitis, coughing, hyperglycaemia, thrombocytopenia, peripheral neuropathy, angioedema, and urticaria.

**Dose:**Angina, by mouth,adult, initially 5 mg once daily, increased if necessary; maximum, 10 mg once daily. Hypertension, by mouth,adult, initially 5 mg once daily, increased if necessary; maximum 10 mg once daily.

**Amlodipine 5mg tablets CMS net price = 0.07 SDG**

### 5.3.2.Sodium nitroprusside

**Indication:** Hypertensive crisis (when treatment by mouth is not possible).

**Contraindications:** severe hepatic impairment; compensatory hypertension; severe vitamin B12 deficiency; Leber optic atrophy.

**Side effects:** Severe hypotension; adverse effects associated with over-rapidreduction in blood pressure include headache, dizziness; retching, abdominal pain; perspiration; palpitations, apprehension, retrosternal discomfort; rarely reduced platelet count, and acute transient phlebitis; adverse effects associated with excessive concentrations of cyanide metabolite include tachycardia, sweating, hyperventilation, arrhythmias, and marked metabolic acidosis (discontinue infusion and give sodium nitrite followed by sodium thiosulfate.

**Dose: -** Hypertensive crisis, by intravenous infusion,adult, initially 0.3–1.5 micrograms/kg/minute, increased gradually to 0.5–6 micrograms/kg/minute; (lower doses in patients already being treated with antihypertensives); maximum, 8 micrograms/kg/minute; stop infusion if response is unsatisfactory after 10 minutes at the maximum dose.

**Sodium nitroprusside 10mg/ml for inj. CMS net price 5ml Ampoule = 9.16 SDG**

### 5.3.3.Methyldopa

**Indication:** Hypertension in pregnancy.

**Contraindications:** Depression; active liver disease; phaeochromocytoma, porphyria.

**Side-effects:** Sedation, dizziness, lightheadedness, postural hypotension, weakness, fatigue, headache, fluid retention and oedema, sexual dysfunction; impaired concentration and memory, depression, mild psychosis, disturbed sleep and nightmares; drug fever, influenza-like syndrome; nausea, vomiting, constipation, diarrhoea, dry mouth, stomatitis, sialadenitis; liver function impairment, hepatitis, jaundice, rarely fatal hepatic necrosis; bone marrow depression, haemolytic anaemia, leukopenia, thrombocytopenia, eosinophilia; parkinsonism; rash including toxic epidermal necrolysis; nasal congestion; black or sore tongue; bradycardia, exacerbation of angina; myalgia, arthralgia, paraesthesia, Bell palsy; pancreatitis; hypersensitivity reactions including lupus erythematosus-like syndrome, myocarditis, pericarditis; gynaecomastia, hyperprolactinaemia, amenorrhoea; urine darkens on standing.

**Dose:** Hypertension in pregnancy, by mouth,adult, initially 250 mg 2–3 times daily; gradually increased at intervals of 2 or more days, if necessary; maximum, 3 g daily.

**Methyldopa 250mg tablet CMS net price = 0.19 SDG**

### 5.3.4.Hydralazine

**Indication:** In combination therapy in moderate to severe hypertension, hypertensive crises; hypertension associated with pregnancy (including preeclampsia or eclampsia); heart failure.

**Contraindications:** Idiopathic systemic lupus erythematosus, severe tachycardia, high output heart failure, myocardial insufficiency due to mechanical obstruction, cor pulmonale, dissecting aortic aneurysm, porphyria.

**Dose:**Hypertension, by mouth,adult, 25 mg twice daily, increased if necessary to maximum, 50 mg twice daily. Hypertensive crisis (including during pregnancy), by slow intravenous injection,ADULT, 5–10 mg diluted with 10 ml sodium chloride, 0.9%; if necessary may be repeated after 20–30 minutes (see also Precautions). Hypertensive crisis (including during pregnancy), by intravenous infusion,adult, initially 200–300 micrograms/minute; usual maintenance dose 50–150 micrograms/minute. Hypertensive crisis (including during pregnancy), by intramuscular injection,adult, 12.5 mg every 2 hours, repeated as necessary.

directions.

**Side effects:** Tachycardia, palpitations, postural hypotension; fluid retention; gastrointestinal disturbances including anorexia, nausea, vomiting, diarrhoea, and rarely constipation; dizziness, flushing, headache; abnormal liver function, jaundice; systemic lupus erythematosus-like syndrome, particularly in women and slow acetylators; nasal congestion, agitation, anxiety, polyneuritis, peripheral neuritis, rash, fever, paraesthesia, arthralgia, myalgia, increased lacrimation, dyspnoea; raised plasma creatinine, proteinuria, haematuria; blood disorders including haemolytic anaemia, leukopenia, and thrombocytopenia.

**Hydralazine Hydrochloride 20 mg / ml for inj. CMS net price ml Ampoule = 16.162 SDG**

### 5.3.5.Propranolol hydrochloride

**Indication:**Hypertension; , arrhythmias and thyrotoxic crisis; Prophylaxis after myocardial infarction; Prophylaxis of variceal bleeding in portal hypertension and Migraine prophylaxis.

**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) 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.

**Side-effects:** Gastro-intestinal disturbances; bradycardia, heart failure, hypotension, conduction disorders, peripheral vasoconstriction (including exacerbation of intermittent claudication and Raynaud's phenomenon); bronchospasm (see above), dyspnoea; 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 80 mg twice daily, increased at weekly intervals as required; maintenance 160–320 mg daily.

Prophylaxis of variceal bleeding in portal hypertension, initially 40 mg twice daily, increased to 80 mg twice daily according to heart rate; max. 160 mg twice daily.

Phaeochromocytoma (only with an alpha-blocker), 60 mg daily for 3 days before surgery *or* 30 mg daily in patients unsuitable for surgery .

Angina, initially 40 mg 2–3 times daily; maintenance 120–240 mg daily.

Arrhythmias, hypertrophic cardiomyopathy, anxiety tachycardia, and thyrotoxicosis (adjunct), 10–40 mg 3–4 times daily.

Anxiety with symptoms such as palpitation, sweating, tremor, 40 mg once daily, increased to 40 mg 3 times daily if necessary.

Prophylaxis after myocardial infarction, 40 mg 4 times daily for 2–3 days, then 80 mg twice daily, beginning 5 to 21 days after infarction.

Essential tremor, initially 40 mg 2–3 times daily; maintenance 80–160 mg daily Migraine prophylaxis, 80–240 mg daily in divided doses.

By intravenous injection, arrhythmias and thyrotoxic crisis, 1 mg over 1 minute; if necessary repeat at 2-minute intervals; max. total dose 10 mg (5 mg in anaesthesia).

**Propranolol hydrochloride 40 mg tablet CMS net price = 0.080 SDG**

### 5.3.6.Metoprolol tartrate

**Indications:** Hypertension; Angina; Arrhythmias and Migraine prophylaxis

**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) 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.

**Side-effects:** Gastro-intestinal disturbances; bradycardia, heart failure, hypotension, conduction disorders, peripheral vasoconstriction (including exacerbation of intermittent claudication and Raynaud's phenomenon); bronchospasm (see above), dyspnoea; 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 necessaryto 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.2.4 mg in divided doses of 600 micrograms.

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.

**Metoprolol tartrate CMS net price = New item**

### 5.3.7. Labetalol Hcl

**Indications:**Hypertension (including hypertension in pregnancy, hypertension with angina, and hypertension following acute myocardial infarction); hypertensive crises; controlled hypotension in anaesthesia

**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) 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.

**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 (50 mg 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 200 mg.

**Labetalol Hcl CMS net price = New item**

### 5.3.8.Diazoxide

**Indications:** Hypertensive emergency including severe hypertension associated with renal disease ; hypoglycaemia.

**Side-effects:** Tachycardia, hypotension, hyperglycaemia, sodium and water retention; rarely cardiomegaly, hyperosmolar non-ketotic coma, leucopenia, thrombocytopenia, and hirsuitism.

**Dose:** By rapid intravenous injection (less than 30 seconds), 1–3 mg/kg to max. single dose of 150 mg; may be repeated after 5–15 minutes if required.

**Diazoxide CMS net price = New item**

### 5.3.9. Lisinopril

**Indications:** Hypertension ; symptomatic heart failure; short-term treatment following myocardial infarction in haemodynamically stable patients; renal complications of diabetes mellitus

**Contra-indications:**ACE inhibitors are contra-indicated in patients with hypersensitivity to ACE inhibitors (including angioedema).

**Side-effects:** less commonly tachycardia, palpitation, cerebrovascular accident, myocardial infarction, Raynaud's syndrome, confusion, mood changes, vertigo, sleep disturbances, asthenia, impotence; rarely dry mouth, gynaecomastia, alopecia, psoriasis; very rarely allergic alveolitis, pulmonary infiltrates, profuse sweating, pemphigus, Stevens-Johnson syndrome, and toxic epidermal necrolysis

**Dose:** Hypertension, initially 10 mg once daily; if used in addition to diuretic (see notes above) or in cardiac decompensation or in volume depletion, initially 2.5–5 mg once daily; usual maintenance dose 20 mg once daily; max. 80 mg once daily.

Heart failure (adjunct), initially 2.5 mg once daily under close medical supervision (see notes above); increased in steps no greater than 10 mg at intervals of at least 2 weeks up to max. 35 mg once daily if tolerated.

Prophylaxis after myocardial infarction, systolic blood pressure over 120 mmHg, 5 mg within 24 hours, followed by further 5 mg 24 hours later, then 10 mg after a further 24 hours, and continuing with 10 mg once daily for 6 weeks (or continued if heart failure); systolic blood pressure 100–120 mmHg, initially 2.5 mg once daily, increased to maintenance dose of 5 mg once daily.

**Lisinopril 5 mg tablet CMS net price = 0.050 SDG, 10 mg = 0.071 SDG, 20 mg = 0.40 mg**

## 5.4.Medicines used in heart failure

### 5.4.1.Dopamine

**Indication:** Cardiogenic shock including in myocardial infarction and cardiac surgery.

**Contraindications**: Tachyarrhythmia, ventricular fibrillation; ischaemic heart disease; phaeochromocytoma; hyperthyroidism.

**Side effects:** Nausea and vomiting; peripheral vasoconstriction; hypotension with dizziness, fainting, flushing; tachycardia, ectopic beats, palpitations, anginal pain; headache, dyspnoea; hypertension particularly in overdosage.

**Dose:** Cardiogenic shock, by intravenous infusion into a large vein,adult, initially 2–5 micrograms/kg/minute, gradually increased by 5–10 micrograms/kg/minute according to blood pressure, cardiac output, and urine output (seriously ill patients, up to 20–50 micrograms/kg/minute).

**Dopamine 40mg/ml for inj CMS net price 5ml Ampoule = 1.6 - 1.84 SDG**

### 5.4.2.Dobutamine

**Indications:** Inotropic support in infarction, cardiac surgery, cardiomyopathies, septic shock, and cardiogenic shock; cardiac stress testing.

**Contra-indications:** Phaeochromocytoma

**Side-effects:** nausea; hypotension, hypertension (marked increase in systolic blood pressure indicates overdose), arrhythmias, palpitations, chest pain; dyspnoea, bronchospasm; headache; fever; increased urinary urgency; eosinophilia; rash, phlebitis; *very rarely* myocardial infarction, hypokalaemia; coronary artery spasm and thrombocytopenia also reported.

**Dose:** By intravenous 2.5–10 micrograms/kg/minute, adjusted according to response.

**Dobutamine HCL 50mg /ml for inj CMS net price 5ml Ampoule = 5.00 SDG**

### 5.4.3.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

**Contra-indications:** -Severe hypovolaemia

**Side-effects:** Ectopic beats, ventricular tachycardia, supraventricular arrhythmias (more likely in patients with pre-existing arrhythmias), hypotension; headache; less commonly ventricular fibrillation, chest pain, tremor, hypokalaemia, thrombocytopenia; very rarely bronchospasm, anaphylaxis, and rash.

**Dose:** By intravenous injection over 10 minutes, either undiluted or diluted before use, 50 micrograms/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 1.13 mg/kg.

**Milrinone CMS net price = New item**

## 5.5.Antithrombotic medicines

### 5.5.1.Streptokinase

**Indication:** Life-threatening deep-vein thrombosis, pulmonary embolism, acute arterial thromboembolism; acute myocardial infarction.

**Contraindications:** repeat use of streptokinase beyond 4 days of first administration; recent haemorrhage, surgery (including dental), parturition, trauma; heavy vaginal bleeding; haemorrhagic stroke, history of cerebrovascular disease (especially recent or if residual disability); coma; severe hypertension; coagulation defects; bleeding diatheses, aortic dissection; risk of gastrointestinal bleeding (such as recent history of peptic ulcer, oesophageal varices, or ulcerative colitis); acute pancreatitis; severe liver disease; acute pulmonary disease with cavitation; previous allergic reactions.

**Side effects:** Nausea and vomiting; bleeding, usually limited to site of injection but internal bleeding including intracranial haemorrhage may occur (if serious bleeding occurs, discontinue infusion; coagulation factors may be required); hypotension, arrhythmias (particularly in myocardial infarction); allergic reactions including rash, flushing, uveitis, and anaphylaxis; fever, chills, back or abdominal pain; Guillain-Barré syndrome reported rarely.

**Dose:** Acute myocardial infarction (preferably within 1 hour of infarction), by intravenous infusion,adult, 1 500 000 IU over 60 minutes. Thrombosis, by intravenous infusion,adult, 250 000 IU over 30 minutes, followed by 100 000 IU every hour for 12–72 hours, according to condition with monitoring of clotting parameters.

**Streptokinase 1.500.000 IU lyophilized for i.v inj CMS net price Vail = 90.00 SDG**

**6. Anti-infective medicines**

**6.1Anthelminthics**

**6.2 Antibacterials**

**6.3Antituberculosis medicines**

**6.4. Antifungal medicines**

**6.5.Antiviral medicines**

**6.6. Antiprotozoal drugs**

**6.1Anthelminthics**

### 6.1.1.Praziquantel

**Indications:** Intestinal schistosomiasis; urinary schistosomiasis; intestinal, liver, and lung; fluke infections; cestode infections

**Contraindication:** Paragonimus infections — treatment in hospital as may be central nervous system involvement; pregnancy (unless immediate treatment required, delay treatment until after delivery; breastfeeding (avoid during and for 72 hours after treatment).

**Side effects:** bdominal discomfort, nausea, vomiting, malaise, headache, dizziness, drowsiness, rectal bleeding; rarely hypersensitivity reactions, including fever, pruritus, and eosinophilia (may be due to dead and dying parasit es).

**Dose:** Intestinal fluke infections, by mouth,adult and childover 4 years, 25 mg/kg as a single dose. Liver and lung fluke infections, by mouth,adult andchild over 4 years25 mg/kg 3 times daily for 2 consecutive days; alternatively 40 mg/kg as single dose; treatment may need to be extended for several days in paragonimiasis.Schistosomiasis, by mouth,adultandchildover 4 years, 40–60 mg/kg as a single dose; or in 3 divided doses of 20 mg/kg at intervals of 4–6 hours.

**Praziquantel 600 mg CMS net price tablet = 0.40SDG**

## 6.2 Antibacterials

### 6.2.1 Beta Lactam medicines

#### 6.2.1.1.Amoxicillin

**Indication: -**Urinary tract infections, upper respiratory tract infections, bronchitis; pneumonia; otitis media; dental abscess and other oral infections osteomyelitis; Lyme disease; endocarditis prophylaxis; post-splenectomy.

**Cautions:** History of allergy to penicillins renal impairment 'erythematous rash common in glandular fever, cytomegalovirus infection, chronic lymphatic leukaemia, and sometimes in HIV infection; maintain adequate hydration with high doses.

**Contraindications:** Hypersensitivity to penicillins

**Side-effects:** Nausea and vomiting, diarrhoea; rash (hypersensitivity or toxic response; may be indicative of a serious reaction – discontinue treatment);hypersensitivity reactions including urticaria, angioedema, anaphylaxis, serum sickness-like reactions, haemolytic anaemia, and interstitial nephritis rarely antibiotic-associated colitis; neutropenia, thrombocytopeniacoagulation disorders; rarely central nervous system disorders including convulsions (associated with high doses or impaired renal function).



**Dose:** Infections due to sensitive organisms, by mouth,adultandchildover 10 years, 250 mg every 8 hours, doubled in severe infections;childup to 10 years, 125 mg every 8 hours, doubled in severe infections. Severe or recurrent purulent respiratory tract infections, by mouth,adult,3 g every 12 hours. Pneumonia, by mouth,adult, 0.5–1 g every 8 hours . Dental abscess (short course), by mouth,adult, 3 g repeated once after 8 hours. Urinary tract infections (short course), by mouth,adult, 3 g repeated once after10–12 hours. Uncomplicated genital chlamydial infection, non-gonococcal urethritis, by mouth,adult, 500 mg every 8 hours for 7 days. Gonorrhoea (short course), by mouth,adult, 3 g as a single dose (with probenecid, 1 g). Otitis media, by mouth,adult, 1 g every 8 hours;child, 40 mg/kg daily in 3 divided doses (maximum, 3 g daily).

**Amoxycillin 500mg cap CMS net price =0.16 SDG, Amoxycillin trihydrate125mg/ 5ml,75ml.bottle = 1.34 SDG ,250mg/5ml 75ml bottle = 1.58 -1.98 SDG**

#### 6.2.1.2.Benzathine benzylpenicillin

**Indications:** Streptococcal pharyngitis; diphtheria; syphilis and other treponemal infections (yaws, pinta, bejel); rheumatic fever prophylaxis.

**Contraindications**: Hypersensitivity to penicillins (see introductory note above); intravascular injection; neurosyphilis.

**cautions:** History of allergy to penicillins

**Side effects:** Hypersensitivity reactions including urticaria, fever, joint pains, rash, angioedema, anaphylaxis, serum sickness-like reactions, haemolytic anaemia, and interstitial nephritis (see also introductory note above); neutropenia, thrombocytopenia, coagulation disorders; rarely central nervous system toxicity (associated with high dosage or severe renal failure); Jarisch-Herxheimer reaction (during treatment for syphilis and other spirochaete infections, probably due to release of endotoxins); rarely nonallergic (embolic–toxic) reactions; pain and inflammation at injection site.

**Dose:** Streptococcal pharyngitis; primary prophylaxis of rheumatic fever, by deep intramuscular injection,adult and child over 30 kg, 900 mg as a single dose;child under 30 kg, 450–675 mg as a single dose. Secondary prophylaxis of rheumatic fever, by deep intramuscular injection,adult and child over 30 kg, 900 mg once every 3–4 weeks;childunder 30 kg, 450 mg once every 3–4 weeks. Early syphilis, by deep intramuscular injection,adult, 1.8 g as a single dose, divided between 2 sites. Late syphilis, by deep intramuscular injection,adult, 1.8 g, divided between 2 sites, once weekly for 3 consecutive weeks.Congenital syphilis (where no evidence of CSF involvement), by deep intramuscular injection,child up to 2 years, 37.5 mg/kg as a single dose .By deep intramuscular injection,adult, 900 mg as a single dose; child, 450 mg as a single dose.

**Benzathine Penicillin 1.2 mega I.U for inj. CMS net price Vail = 0.370 SDG, 2.4 mega I.U. for inj / vial = 0.78 SDG**

### 6.2.1.3. Benzylpenicillin

**Indications:** Pneumonia; throat infections; otitis media; Lyme disease; streptococcal endocarditis; meningococcal disease; necrotizing enterocolitis; necrotizing fasciitis; leptospirosis; neurosyphilis; anthrax; relapsing fever; actinomycosis; brain abscess; gas gangrene; cellulitis; osteomyelitis.

**Contraindications:** Hypersensitivity to penicillins (see introductory note above); avoid intrathecal route (see introductory note above).

**cautions:** History of allergy to penicillins (see introductory note above); renal failure

**Dose:** Mild to moderate infections due to sensitive organisms, by intramuscular injection, by slow intravenous injection or by intravenous infusion, adult, 2.4–4.8 g daily in 4 divided doses, with higher doses in severe infections; neonate under 1

week, 50 mg/kg daily in 2 divided doses; neonate 1–4 weeks, 75 mg/kg daily in 3 divided doses;child1 month–12 years, 100 mg/kg daily in 4 divided doses, with higher doses in severe infections. Bacterial endocarditis, by slow intravenous injection or by intravenous infusion, adult,7.2–14.4g daily in 6 divided doses. Meningococcal disease, by slow intravenous injection or by intravenous infusion,adult,up to 14.4 g daily in divided doses; premature infant 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;child1 month–12 years,180 300 mg/kg daily in 4–6 divided doses.Suspected meningococcal disease (before transfer to hospital), by intramuscular injection or by slow intravenous injection,adultandchildover 10 years, 1.2 g infant under 1 year, 300 mg;child1–9 years, 600 mg. Neurosyphilis, by slow intravenous injection,adult, 1.8–2.4 g every 4 hours for2 weeks.Congenital syphilis, by slow intravenous injection, child up to 2 years, 30 mg/kgtwice daily for the first 7 days of life, then 30 mg/kg 3 times daily for 3 days; by intramuscular injection or slow intravenous injection,child over 2 years,120–180 mg/kg (maximum, 1.44 g) daily in 4–6 divided doses for 10–14 days.

**Benzyl Penicillin Sodium 1mega IU.for inj. CMS net price Vail = 0.24 SDG**

### 6.2.1.4. Ceftazidime



**Indications:** Infections due to sensitive bacteria, especially those due to Pseudomonas spp. and those resistant to aminoglycosides.

**Contraindications:** Hypersensitivity to cefalosporins; porphyria.

**Cautions:** Sensitivity to beta lactam antibacterials (avoid if history of immediate hypersensitivity reaction.

**side effects:** diarrhoea, nausea and vomiting, abdominal discomfort,headache; rarely antibiotic-associated colitis (particularly with higher doses); allergic reactions including rash, pruritus, urticaria, serum sickness-like reactions, fever and arthralgia, and anaphylaxis; erythema multiforme and toxic epidermal necrolysis reported; transient hepatitis, cholestatic jaundice; eosinophilia and blood disorders (including thrombocytopenia, leukopenia, agranulocytosis, aplastic anaemia, and haemolytic anaemia); reversible interstitial nephritis; nervousness, sleep disturbances, confusion, hypertonia, and dizziness.

**Dose:** Infections due to susceptible organisms, by deep intramuscular injection, by intravenous injection, or by intravenous infusion,adult, 1 g every 8 hours or 2 g every 12 hours; in severe infections (including in the immunocompromised),2 g every 8–12 hours or 3 g every 12 hours (in the elderly , usual maximum, 3 g daily); neonate and

Infant up to 2 months, 25–60 mg/kg daily in 2 divided doses;Child over 2 months, 30–100 mg/kg daily in 2–3 divided doses (intravenous route recommended forchildren). Pseudomonal lung infection in cystic fibrosis, by deep intramuscular injection, by intravenous injection, or by intravenous infusion,adult,100–150 mg/kg daily in3 divided doses. Infections in the immunocompromised, cystic fibrosis, or meningitis, by intravenous injection or intravenous infusion,childover 2 months up to 150 mg/kg daily in 3 divided doses (maximum, 6 g daily). directions. Intramuscular doses over 1 g should be divided between more than one site.

**Ceftazidime 1000mg powder for inj CMS net price Vail = 17.76 SDG**

### 6.2.1.5. Ceftriaxone

**Indications:** Serious infections due to sensitive bacteria, including septicaemia, pneumonia, and meningitis; osteomyelitis, septic arthritis; Haemophilus influenzae epiglottis; surgical prophylaxis; prophylaxis of meningococcal meningitis; shigellosis, invasive salmonellosis; endocarditis; gonococcal conjunctivitis; gonorrhoea; pelvic inflammatory disease; Lyme disease.

**Contraindications:** Hypersensitivity to cefalosporins; porphyria; neonates with jaundice, hypoalbuminaemia, acidosis or impaired bilirubin binding.

**Cautions:** Sensitivity to beta lactam antibacterials (avoid if history of immediate hypersensitivity reactions; see introductory note above); severe renal impairment treatment longer than 14 days, renal failure, dehydration, or concomitant total parenteral nutrition (risk of ceftriaxone precipitation in gallbladder); pregnancy and false positive urinary glucose (if tested for reducing substances) and false positive Coombs' test.

**Side-effects:** Diarrhoea, nausea and vomiting, abdominal discomfort, headache; rarely antibiotic-associated colitis (particularly with higher doses); allergic reactions including rash, pruritus, urticaria, serum sickness-like reactions, fever and arthralgia, and anaphylaxis; erythema multiforme and toxic epidermal necrolysis reported; transient hepatitis, cholestatic jaundice; eosinophilia and blood disorders (including thrombocytopenia,leukopenia, agranulocytosis, aplastic anaemia, and haemolytic anaemia); reversible interstitial nephritis, hyperactivity, nervousness, sleep disturbances, hallucinations, confusion, hypertonia and dizziness; calcium ceftriaxone precipitates in the urine (particularly in the very young, the dehydrated, or in those who are immobilized) or in the gallbladder (consider discontinuation if symptomatic); rarely prolongation of prothrombin time and pancreatitis.

**Dose:** Infections due to susceptible organisms, by deep intramuscular injection, by intravenous injection (over at least 2–4 minutes), or by intravenous infusion,adult, 1 g daily; up to 2–4 g daily in severe infections; infant and child under 50 kg, 20–50

mg/kg daily should be given, up to 80 mg/kg daily in severe infections (doses of 50 mg/kg and over by intravenous infusion only); by intravenous infusion (over 60 minutes), neonate, 20–50 mg/kg daily (maximum, 50 mg/kg daily). Uncomplicated gonorrhoea and gonococcal conjunctivitis, by deep intramuscular injection,Adult,125 mg as a single dose (also used with doxycycline and/or metronidazole to treat pelvic inflammatory disease). Neonatal gonococcal conjunctivitis, by intramuscular injection, Neonate, 50 mg/kg as a single dose (maximum, 125 mg). Disseminated gonococcal infection, by deep intramuscular injection or by intravenous injection,adult, 1 g daily for 7days. Surgical prophylaxis, by deep intramuscular injection or by intravenous injection (over at least 2–4 minutes),adult, 1 g at induction. Colorectal surgery (with an antibacterial active against anaerobes), by deep intramuscular injection, by intravenous injection (over at least 2–4 minutes), or by intravenous infusion,adult, 2 g as a single dose.

**Ceftriaxone Sodium 500mg/vial powder for reconstitution CMS net price = 1.20 SDG , 1g/vial powder for reconstitution = 2.5 SDG**

### 6.2.1.5. Cephalexin monohydrate

**Indications:** Infections due to sensitive Gram-positive and Gram-negative bacteria
**Cautions:** sensitivity to beta-lactam antibacterials (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
**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:** 250 mg every 6 hours or 500 mg every 8–12 hours increased to 1–1.5 g every 6–8 hours for severe infections;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, 5–12 years 250 mg every 8 hours. Prophylaxis of recurrent urinary-tract infection,adult125 mg at night

**Cephalexin monohydrate 125mg/5ml CMS net price 100 ml = 2.00- 2.060 SDG , 250mg/5ml (100ml) susp = 2.5- 2.85 SDG**

### 6.2.1.6. Cefuroxime

**Indications:** Infections due to sensitive Gram-positive and Gram-negative bacteria

**Cautions:** Sensitivity to beta-lactam antibacterials (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.

**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 pyelonephritischildover 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) .

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 n every 8 hours for high-risk procedures.

**Cefuroxime as Sodium salt 750 mg CMS net price = 3.500 SDG, 1g powder for reconstitution for IV/IM injection = New Item**

### 6.2.1.7.Procaine benzylpenicillin

**Indications:** Syphilis; anthrax; pneumonia; diphtheria; cellulitis; mouth infections; animal bites.

**Cautions:** History of allergy to penicillins (see note above); renal failure.

**Contraindications:** Hypersensitivity to penicillins (see introductory note above); intravascular injection.

**Side effects**: Hypersensitivity reactions including urticaria, fever, joint pains, rash, angioedema, anaphylaxis, serum sickness-like reactions, haemolytic anaemia, and interstitial nephritis (see also introductory note above); neutropenia, thrombocytopenia, coagulation disorders and central nervous system toxicity (associated with high doses and severe renal failure); (during treatment for syphilis and other spirochaete infections, probably due to release of endotoxins); rarely, non-allergic (embolic–toxic) reactions; pain and inflammation at injection site.

**Dose:** Infections due to sensitive organisms, by deep intramuscular injection,adult, 0.6–1.2 g daily.Pneumonia, by deep intramuscular injection,child, 50 mg/kg daily for 10 days. Syphilis, by deep intramuscular injection,adult, 1.2 g daily for 10–15 days, or upto 3 weeks in late syphilis. Neurosyphilis, by deep intramuscular injection,adult, 1.2 g daily (together with probenecid, 500 mg 4 times daily by mouth) for 10–14 days. Congenital syphilis, by deep intramuscular injection,childup to 2 years, 50 mg/kg daily for 10 days.

**Procaine penicillin 1000000 IU.for inj. CMS net price Vail = 0.290 SDG**

### 6.2.2 Other antibacterials

### 6.2.2.1.Azithromycin

**Indications:** Azithromycin is more active than erythromycin against some Gram-negative organisms such as Chlamydia trachomatis. The concentration and persistence of azithromycin is much higher in tissue than in plasma. A single dose of azithromycin is recommended for use in the treatment of uncomplicated genital chlamydia and trachoma, but it is not recommended if there is a possibility of gonorrhoea because macrolide resistance emerges rapidly when it is used under these circumstances.

**Side effects:** See under Erythromycin (but fewer gastrointestinal effects); also anorexia, dyspepsia, flatulence, constipation, pancreatitis; syncope, dizziness, headache, drowsiness, agitation, anxiety, hyperactivity; photosensitivity; hepatitis, interstitial nephritis, acute renal failure, asthenia, paraesthesia, arthralgia,

convulsions, mild neutropenia, thrombocytopenia, tinnitus, hepatic necrosis, hepatic failure, tongue discoloration, and taste disturbances.

**Dose:** Uncomplicated genital chlamydial infections, trachoma, by mouth,adultover 45 kg, 1 g as a single dose;adult, under 45 kg, 20 mg/kg as a single dose.

**Azithromycin 250 mg cap CMS net price = 0.710 -0.720 SDG , dihydrate 200mg/5ml suspension, 15 ml = 4.62 SDG**

### 6.2.2.2.Chloramphenicol

**Indications:** Severe life-threatening infections, particularly those caused by *Haemophilus influenzae* and typhoid fever; also, pneumonia; cerebral abscess; mastoiditis; rickettsia; relapsing fever; gangrene; granuloma inguinale; listeriosis; plague; psitticosis; tularaemia; Whipple disease; septicaemia; meningitis.

**cautions:** Avoid repeated courses and prolonged use; hepatic impairment ; severe renal impairment (reduce dose;; blood counts required before and during treatment; monitor plasma concentrations in neonates (see below); breastfeeding.

**Contraindications**: Pregnancy.

**Side-effects:** Bone marrow depression—reversible and irreversible aplastic anaemia (with reports of leukaemia), anaemia, leukopenia, and thrombocytopenia; nocturnal haemoglobinuria; peripheral neuritis and optic neuritis; nausea, vomiting, diarrhoea, dry mouth, stomatitis, glossitis; headache, depression; hypersensitivity reactions including rash, urticaria, fever, angioedema, and rarely anaphylaxis; grey syndrome (vomiting, greenish diarrhoea, abdominal distension, hypothermia, pallid cyanosis, irregular respiration, circulatory collapse) may follow excessive doses in neonates with immature hepatic metabolism; grey syndrome also reported in infants born to mothers treated in late pregnancy.

**Dose:** Infections due to susceptible organisms which are not susceptible to other antimicrobials, by mouth, by intravenous injection, or by intravenous infusion,adultandchild, 50 mg/kg daily in 4 divided doses; up to 100 mg/kg daily in divided doses in severe infections such as meningitis, septicaemia, and haemophilus epiglottitis (reduce high doses as soon as clinically indicated); neonate under 2 weeks, 25 mg/kg daily in 4 divided doses; infant 2 weeks to 1 year, 50 mg/kg daily in 4 divided doses. Epidemics of meningococcal meningitis, by intramuscular injection (of oily suspension ) adult, 3 g as a single dose, repeated after 48 hours if necessary; infant 1–8 weeks, 250 mg as a single dose; infant 2–11 months, 500 mg as a single dose;child1–2 years, 1 g as a single dose;child 3–5 years, 1.5 g as a single dose;child6–9 years, 2 g as a single dose;child10–14 years, 2.5 g as a single dose;childover 15 years, as foradult, repeated after 48 hours if necessary. The oily suspension is for intramuscular use only.

**Chloramphenicol 250mg cap CMS net price =0.10 SDG, 1gm/inj = 0.85 SDG, 0.5 % w/v eye drop 10ml in dropper =2.5 SDG**

### 6.2.2.3.Nalidixic acid

**Indications:** Urinary-tract infections

**Cautions:** Avoid in acute porphyria false positive urinary glucose (if tested for reducing substances); monitor blood counts, renal and liver function if treatment exceeds 2 weeks

**Contra-indications:** Quinolones 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 inchildren or adolescents (arthropathy has developed in weight-bearing joints in young *animals*. Exposure to excessive sunlight should be avoided (discontinue if photosensitivity occurs). Quinolones can prolong the QT interval. Moxifloxacin is contra-indicated in 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, concomitant use with other drugs known to prolong the QT interval, history of symptomatic arrhythmias) and the other quinolones should be used with caution in these patients.



**Side-effects:** Of the quinolones include nausea, vomiting, dyspepsia, abdominal pain, diarrhoea (rarely antibiotic-associated colitis), headache, dizziness, rash (very rarely Stevens-Johnson syndrome and toxic epidermal necrolysis). Less frequent side-effects include anorexia, sleep disturbances, asthenia, confusion, anxiety, depression, hallucinations, tremor, blood disorders (including eosinophilia, leucopenia, thrombocytopenia), arthralgia, myalgia, disturbances in vision and taste. Other side-effects reported rarely or very rarely include hepatic dysfunction (including jaundice and hepatitis), hypotension, vasculitis, dyspnoea (more frequent with moxifloxacin), convulsions, psychoses, paraesthesia, renal failure, interstitial nephritis, tendon inflammation and damage photosensitivity, disturbances in hearing and smell. The drug should be discontinued if psychiatric, neurological or hypersensitivity reactions (including severe rash) occur. ; also reported toxic psychosis, increased intracranial pressure, cranial nerve palsy, peripheral neuropathy, and metabolic acidosis.

**Dose:** 900 mg every 6 hours for 7 days, reduced in chronic infections to 600 mg every 6 hours.

**Nalidixic acid 500 mg tablet CMS net price = 0.510 SDG**

### 6.2.2.4.Ciprofloxacin

**Indications:** Gastroenteritis (including cholera, shigellosis, travellers' diarrhoea campylobacter, and salmonella enteritis typhoid; gonorrhoea; chancroid; pelvic inflammatory disease (with doxycycline and metronidazole); legionnaires' disease; meningitis (including meningococcal meningitis prophylaxis); respiratory tract infections (including pseudomonal infections in cystic fibrosis, but not pneumococcal pneumonia); urinary tract infections; bone and joint infections; septicaemia; anthrax; skin infections; otitis externa; prophylaxis in surgery.

**Cautions:** History of epilepsy or conditions that predispose to seizures, G6PD deficiency, myasthenia gravis (risk of exacerbation), avoid exposure to excessive sunlight (discontinue if photosensitivity occurs); rarely tendon damage avoid excessive alkalinity of urine and ensure adequate fluid intake (risk of crystalluria) Ciprofloxacin causes arthropathy in the weight-bearing joints of immature animals and is therefore generally not recommended for use inchildren and growing adolescents. However, the significance of this effect in humans is uncertain and in some specific circumstances, short-term use of ciprofloxacin inchildren may bejustified. For example, ciprofloxacin is used to treat pseudomonal infections in cysticfibrosis (forchildren over 5 years.

**Contraindications:** History of tendon disorders related to quinolone use.

**Side-effects:** Nausea, vomiting, dyspepsia, abdominal pain, flatulence, diarrhoea (rarely antibiotic-associated colitis); pancreatitis, dysphagia, tremor, hyperglycaemia, headache, dizziness, sleep disorders, rash (rarely erythema multiforme (Stevens-Johnson syndrome) and toxic epidermal necrolysis), pruritus; vasculitis, erythema nodosum, petechiae, haemorrhagic bullae; less frequently anorexia and increased blood urea and creatinine; drowsiness, restlessness, asthenia, depression, confusion, hallucinations, convulsions, paraesthesia, hypoesthesia, movement disorders; photosensitivity, hypersensitivity reactions (including fever, urticaria, angioedema, arthralgia, myalgia, and anaphylaxis); blood disorders (including eosinophilia, leukopenia, thrombocytopenia); disturbances in vision, taste, hearing, and smell, tinnitus; tenosynovitis; tachycardia, hypotension, oedema, syncope, hot flushes and sweating; also isolated reports of tendon inflammation and damage (especially in theelderly and in those taking corticosteroids), haemolytic anaemia, renal failure, interstitial nephritis, and hepatic dysfunction (including hepatitis and cholestatic jaundice); discontinue if psychiatric, neurological, or hypersensitivity reactions (including severe rash) occur.

**Dose:** Infections due to susceptible organisms, by mouth,adult, 250–750 mg twice daily.

Shigellosis, by mouth,adult, 500 mg twice daily for 3 days. Cholera, by mouth,adult, 1 g as a single dose. Acute uncomplicated cystitis, by mouth,adult, 100 mg twice daily for 3 days. Gonorrhoea and gonococcal conjunctivitis, by mouth,adult, 500 mg as a single dose. Chancroid, by mouth,adult, 500 mg twice daily for 3 days. Pelvic inflammatory disease, by mouth,adult, 500 mg twice daily. Pseudomonal lower respiratory tract infection in cystic fibrosis, by mouth,adult, 750 mg twice daily;child5–17 years, (see also Precautions), up to 20 mg/kg twice daily (maximum, 1.5 g daily). Surgical prophylaxis, by mouth,adult, 750 mg, 60–90 minutes before procedure. Prophylaxis of meningococcal meningitis, by mouth,adult, 500 mg as a single dose.

**Ciprofloxacin 2 mg/ml CMS net price 100ml bottle = 5.81 SDG**

### 6.2.2.4. Norfloxacin

**Indications:** See under Dose

**Cautions:** Quinolones 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 inchildren or adolescents (arthropathy has developed in weight-bearing joints in young *animals*—see below). Exposure to excessive sunlight should be avoided (discontinue if photosensitivity occurs). Quinolones can prolong the QT interval. Moxifloxacin is contra-indicated in 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, concomitant use with other drugs known to prolong the QT interval, history of symptomatic arrhythmias) and the other quinolones should be used with caution in these patients. The CSM has warned that quinolones may induce convulsions in patients with or without a history of convulsions; taking NSAIDs at the same time may also induce them

**Contra-indications:** Quinolone hypersensitivity

**Side-effects:** Side-effects of the quinolones include nausea, vomiting, dyspepsia, abdominal pain, diarrhoea (rarely antibiotic-associated colitis), headache, dizziness, rash (very rarely Stevens-Johnson syndrome and toxic epidermal necrolysis). Less frequent side-effects include anorexia, sleep disturbances, asthenia, confusion, anxiety, depression, hallucinations, tremor, blood disorders (including eosinophilia, leucopenia, thrombocytopenia), arthralgia, myalgia, disturbances in vision and taste. Other side-effects reported rarely or very rarely include hepatic dysfunction (including jaundice and hepatitis), hypotension, vasculitis, dyspnoea (more frequent with moxifloxacin), convulsions, psychoses, paraesthesia, renal failure, interstitial

nephritis, tendon inflammation and damage, photosensitivity, disturbances in hearing and smell. The drug should be discontinued if psychiatric, neurological or hypersensitivity reactions (including severe rash) occur also tinnitus, epiphora; rarely pancreatitis; very rarely arrhythmias; also reported, polyneuropathy and exfoliative dermatitis.

**Dose:** Lower urinary-tract infections, 400 mg twice daily for 7–10 days (for 3 days for uncomplicated infections in women) Chronic relapsing 'lower' 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 400mg tablet CMS net price = 0.206 SDG**

### 6.2.2.5. Amikacin sulphate

**Indications:** Serious gram-negative infections resistant to gentamicin.

**Cautions:** The main side-effects of the aminoglycosides are dose-related, therefore, care must be taken with dosage, and, whenever possible, parenteral treatment should not exceed 7 days. Renal function should be assessed before starting an aminoglycoside and during treatment. If possible, dehydration should be corrected before starting an aminoglycoside. Auditory and vestibular function should also be monitored during treatment. In order to optimise the dose and avoid toxicity, serum-aminoglycoside concentrations should be monitored in patients receiving parenteral aminoglycosides (see also Serum Concentrations). Ototoxicity and nephrotoxicity occur most commonly in the elderly ; therefore, monitoring is particularly important in these patients, who may require reduced doses.

Aminoglycosides should be used with caution in those with conditions characterised by muscular weakness (avoid in myasthenia gravis). Aminoglycosides should preferably not be given with potentially ototoxic diuretics (e.g. furosemide); if concurrent use is unavoidable administration of the aminoglycoside and of the diuretic should be separated by as long a period as practicable.

**Contra-indications:** Aminoglycosides may impair neuromuscular transmission and should not be given to patients with myasthenia gravis

**Side-effects:** The important side-effects of the aminoglycosides are nephrotoxicity and irreversible ototoxicity (including vestibular and auditory damage). Rash occurs commonly with streptomycin, but less frequently with the other aminoglycosides. Rare side-effects include nausea, vomiting, antibiotic-associated colitis, peripheral neuropathy, electrolyte disturbances (notably hypomagnesaemia on prolonged therapy, but also hypocalcaemia and hypokalaemia), and stomatitis.

Side-effects reported very rarely include blood disorders and CNS effects (including headache, encephalopathy, and convulsions). Aminoglycosides may impair neuromuscular transmission; large doses given during surgery have been responsible for a transient myasthenic syndrome in patients with normal neuromuscular function.

**Dose:** Multiple daily dose regimen, by intramuscular or by slow intravenous injection or by infusion, 15 mg/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).

Once daily dose regimen (not for endocarditis, febrile neutropenia, or meningitis; see notes above and also consult local guidelines), by intravenous infusion, initially 15 mg/kg (max.1.5 g), then adjust according to serum-amikacin concentration; max. cumulative dose 15 g.

**Amikacin Sulphate 500mg/2ml CMS net price Vial = 1.20 -1.80 SDG**

### 6.2.2.6. Doxycycline

**Indications:** Supplement to quinine or artesunate treatment for multidrug-resistant. *P falciparum* malaria; short-term prophylaxis of multidrug-resistant *P. falciparum* malaria; see also notes above; bacterial infections

**Contraindications:** Children under 8 years; porphyria; systemic lupus erythematosus.

**cautions:** Avoid exposure to sunlight or sunlamps (photosensitivity reported

**Side-effects:** gastrointestinal disturbances; anorexia; flushing, tinnitus; photosensitivity; hypersensitivity reactions (including rash, exfoliative dermatitis, Stevens-Johnson syndrome, urticaria, angioedema, anaphylaxis and pericarditis); headache and visual disturbances; hepatotoxicity, blood disorders, pancreatitis and antibiotic-associated colitis reported; staining of growing teeth and occasional dental hypoplasia.

**Dose:** Supplement to malaria treatment (see note above), by mouth,adultandchildover 8 years, 100 mg twice daily for 7–10 days. Short-term prophylaxis of malaria, by mouth,adult, 100 mg daily for up to 8 weeks;childover 8 years, 1.5 mg/kg daily for up to 8 weeks; doxycycline should be started on the day before exposure and continued for 4 weeks after last risk of exposure.

**Doxycycline100mg tablet CMS net price = 0.08- 0.11SDG**

### 6.2.2.7. Erythromycin

**Indications:** Alternative to penicillin in hypersensitive patients; sinusitis; otitis externa; oral infections; cholera; respiratory tract infections (including pneumonia and legionnaires' disease); syphilis; chancroid; chlamydia; neonatal chlamydial conjunctivitis; non-gonococcal urethritis; prostatitis; lymphogranuloma venereum; campylobacter enteritis; relapsing fever; skin infections; diphtheria; diphtheria and whooping cough prophylaxis; Q fever inchildren.

**cautions:** predisposition to QT interval prolongation (including electrolyte disturbances and concomitant use of drugs that prolong the QT interval.

**Contraindications:** - hypersensitivity to erythromycin or other macrolides; porphyria.

**Dose:** Infections due to sensitive organisms, by mouth, adult and child over 8 years, 250–500 mg every 6 hours, up to 4 g daily in severe infections;childup to 2 years, 125 mg every 6 hours, doubled in severe infections; child2–8 years, 250 mg every 6 hours, doubled in severe infections. Early syphilis, by mouth,adult, 500 mg 4 times daily for 14 days. Late latent syphilis, by mouth,adult, 500 mg 4 times daily for 30 days. Uncomplicated genital chlamydia, non-gonococcal urethritis, chancroid, by mouth,adult, 500 mg 4 times daily for 7 days (14 days in lymphogranuloma venereum). Severe infections due to sensitive organisms, by intravenous infusion,adultandchild, 50 mg/kg daily by continuous infusion or in divided doses every 6 hours.

**Side effects:** Gastrointestinal effects including nausea, vomiting, abdominal discomfort, diarrhoea, and rarely antibiotic-associated colitis; less frequently urticaria, rash, and other allergic reactions (rarely anaphylaxis); reversible hearing loss after large doses; cholestatic jaundice, infantile hypertrophic pyloric stenosis, cardiac effects (including chest pain and arrhythmias), myasthenia-like syndrome, erythema multiforme (Stevens-Johnson syndrome), toxic epidermal necrolysis.

**Erythromycin stearate or ethyl succinate 250mg tablet CMS net price = 0.22 - 0.25 SDG, 250mg/5ml (100ml) bottle = 5.35 SDG**

### 6.2.2.8. Gentamicin

**Indications:** Pneumonia; cholecystitis; peritonitis plague; endocarditis; septicaemia; acute pyelonephritis; prostatitis; otitis externa; skin and soft tissue infections; pelvic inflammatory disease (with clindamycin);; meningitis; listeriosis; tularaemia; brucellosis;; surgical prophylaxis; eye infections.

**Cautions:** Renal impairment; neonates, infants, and theelderly (adjust dosage and monitor renal, auditory, and vestibular function, and serum gentamicin concentrations); avoid prolonged use; conditions characterized by muscular weakness; obesity (use ideal body weight to calculate dose and monitor serum gentamicin concentration closely.

**Contraindications: -** Myasthenia gravis.

**Side-effects:** Vestibular and auditory damage also, nephrotoxicity, hypomagnesaemia on prolonged therapy; antibiotic-associated colitis, stomatitis; also nausea, vomiting, rash, and blood disorders.

**Dose:** Infections due to susceptible organisms, by intramuscular injection or by slow intravenous injection (over at least 3 minutes) or by intravenous infusion, adult, 3–5 mg/kg daily in divided doses every 8 hours; NEONATE up to 2 weeks, 3 mg/kg every 12 hours;child2 weeks–12 years, 2 mg/kg every 8 hours. Pelvic inflammatory disease (with clindamycin), by intravenous injection,adult, 1.5 mg/kg every 8 hours. Endocarditis (as part of combination therapy), by intramuscular injection or by intravenous injection (over at least 3 minutes),adult, 1 mg/kg every 8 hours. Surgical prophylaxis (with clindamycin), by intravenous injection,adult, 5 mg/kg as a single dose at induction.





**Gentamycin Sulphate 40mg/ml for inj CMS net price 2ml Ampoule = 0.25 SDG**

### 6.2.2.9. Metronidazole

**Indications:** Anaerobic bacterial infections, including gingivitis and other oral infections, pelvic inflammatory disease (with doxycycline and either ciprofloxacin or ceftriaxone;), tetanus, septicaemia, peritonitis, brain abscess, necrotizing pneumonia, antibiotic-associated colitis, leg ulcers and pressure sores and surgical prophylaxis; bacterial vaginosis; skin and soft tissue infections, animal bites (with doxycycline); tissue nematode infections in particular, dracunculiasis; trichomonal vaginitis, amoebiasis, and giardiasis( *Helicobacter pylori)* eradication

**cautions:** Disulfiram-like reaction with alcohol; hepatic impairment and hepatic encephalopathy clinical and laboratory monitoring recommended in courses lasting longer than 10 days.

**Contraindications: -** Chronic alcohol dependence.

**Dose:** Anaerobic infections (usually treated for 7 days), by mouth,adult, 800 mg initially, then 400 mg every 8 hours or 500 mg every 8 hours;child, 7.5 mg/kg every 8 hours. Anaerobic infections, by intravenous infusion over 20 minutes,adult, 500

mg every 8 hours;child, 7.5 mg/kg every 8 hours. Anaerobic infections, by rectum,adultandchildover 10 years, 1 g every 8 hours for 3 days, then 1 g every 12 hours;childup to 1 year, 125 mg every 8 hours for 3 days, then every 12 hours;child1–5 years, 250 mg;

child 5–10 years, 500 mg. Bacterial vaginosis, by mouth,adult, 2 g as a single dose or 400–500 mg twice daily for 5–7 days. Pelvic inflammatory disease, by mouth,adult, 400–500 mg twice daily for 14 days. Leg ulcers and pressure sores, by mouth,adult400 mg every 8 hours for 7 days. Acute ulcerative gingivitis, by mouth,adult, 200–250 mg every 8 hours for 3 days;child1–3 years, 50 mg every 8 hours for 3 days;child3–7 years, 100 mg every 12 hours for 3 days;child7–10 years, 100 mg every 8 hours for 3 days. Acute oral infections, by mouth,adult, 200 mg every 8 hours for 3–7 days;child1–3 years, 50 mg every 8 hours for 3–7 days;child3–7 years, 100 mg every 12 hours for 3-7 days;child7–10 years, 100 mg every 8 hours for 3-7 days. Antibiotic-associated colitis, by mouth,adult, 800 mg initially, then 400 mg 3 times daily for 10 days. Surgical prophylaxis, by mouth,adult, 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. Surgical prophylaxis, by rectum,adult, 1 g 2 hours before surgery; up to 3 further doses of 1 g may be given every 8 hours for high-risk procedures;child5–10 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. Surgical prophylaxis by intravenous infusion ,adult, 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 200mg tablet CMS net price = 0.03 - 0.05 SDG , 200mg/5ml susp.100 ml = 1.96 SDG, 5mg/ml in 100ml infusion = 2.5 -5.2 SDG,**

### 6.2.2.10.Nitrofurantoin

**Indications:** Urinary tract infections.

**Cautions:** Pulmonary disorders; hepatic impairment; monitor lung and liver function on long-term therapy (discontinue if lung function deteriorates); neurological or allergic disorders; anaemia; diabetes mellitus; theelderly and debilitated; vitamin B and folate deficiency; use may result in false positive urinary glucose (if testing for reducing substances); urine may be coloured yellow or brown.

**Contraindications:** Impaired renal function; infants less than 3 months; G6PD-deficiency including breastfeeding of affected infants ; pregnancy at term; porphyria.

**Side-effects:** Dose-related gastrointestinal disorders; nausea; hypersensitivity reactions including urticaria, rash, siala denitis, pruritus, and angioedema; anaphylaxis reported; rarely, cholestatic jaundice, hepatitis, and exfoliative dermatitis; erythema multiforme, pancreatitis, arthralgia; blood disorders; pulmonary reactions (including pulmonary fibrosis; possible association with lupus erythematosus-like syndrome); peripheral neuropathy;benign intracranial hypertension; transient alopecia.

**Dose:** Acute uncomplicated urinary tract infections, by mouth,adult, 100 mg every 12 hours or 50 mg every 6 hours, with food for 7 days;childover 3 months, 3 mg/kg daily in 4 divided doses. Severe recurrent urinary tract infection, by mouth,adult, 100 mg every 6 hours with food for 7 days (reduced to 200 mg daily in divided doses if severe nausea). Prophylaxis of chronic urinary tract infections, by mouth,adult, 50–100 mg at night;childover 3 months, 1 mg/kg at night (with regular monitoring of lung and liver function).

**Nitrofurantoin 100mg tab CMS net price = 0.10 SDG**

### 6.2.2.11.Cotrimoxazole

### (Sulphamethoxazole+Trimethoprim)



**Indications:** Urinary tract infections; respiratory tract infections including bronchitis, pneumonia, and infections in cystic fibrosis; typhoid fever; melioidosis; listeriosis; brucellosis; granuloma inguinale; neonatal chlamydial conjunctivitis; otitis media; skin infections, animal bites; pneumonia .

**cautions:** Renal impairment hepatic impairment maintain adequate fluid intake (to avoid crystalluria); blood disorders (avoid unless under specialist supervision; monitor blood counts and discontinue immediately if blood disorder develops); rash (discontinue immediately); predisposition to folate deficiency or hyperkalaemia, the elderly ; asthma; G6PD deficiency.

**Contraindications:** Hypersensitivity to sulfonamides or trimethoprim; porphyria.

**Side effects:** Nausea, diarrhoea; headache; hyperkalaemia; hypersensitivity reactions including rash and very rarely, Stevens-Johnson syndrome, toxic epidermal necrolysis, and 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 leukopenia, thrombocytopenia, megaloblastic anaemia, and eosinophilia), hyponatraemia, renal disorders (including interstitial nephritis), arthralgia, myalgia, vasculitis, and systemic lupus erythematosus.

**Dose:** Infections due to susceptible organisms (which are not susceptible to other antibacterials), by mouth,adult, sulfamethoxazole 800 mg + trimethoprim 160 mg every 12 hours, increased to sulfamethoxazole 1.2 g + trimethoprim 240 mg every 12 hours in more severe infections; child 6 weeks–5 months, sulfamethoxazole 100 mg + trimethoprim 20 mg every 12 hours; child 6 months –5 years, sulfamethoxazole 200 mg + trimethoprim 40 mg every 12 hours;child 6–12 years, sulfamethoxazole 400 mg + trimethoprim 80 mg every 12 hours; by intravenous infusion, adult, sulfamethoxazole 800 mg + trimethoprim 160 mg every 12 hours, increased to sulfamethoxazole 1.2 g + trimethoprim 240 mg, every 12 hours in more severe infections; child, sulfamethoxazole 30mg/kg daily + trimethoprim 6 mg/kg daily in 2 divided doses.

**Co-trimoxazole 240mg/5ml cms net price 100ml Bott. = 1.36 SDG**

### 6.2.2.12. Vancomycin

**Indications:** Meticillin-resistant staphylococcal pneumonia; septicaemia related to vascular catheter; meningitis; antibiotic-associated colitis; endocarditis prophylaxis (with gentamicin).

**cautions: -** Avoid rapid infusion (risk of anaphylactoid reactions, see Adverse effects); rotate infusion sites; renal impairment the elderly ; history of deafness (avoid); monitor plasma vancomycin concentration after 3 or 4 doses (earlier in theelderly and in renal impairment), blood counts, urine, and renal function; monitor auditory function in theelderly or in renal impairment

**Side effects:** Nephrotoxicity including renal failure and interstitial nephritis; ototoxicity (discontinue if tinnitus occurs); blood disorders; nausea, chills, fever, eosinophilia, anaphylaxis, rash, including exfoliative dermatitis, erythema multiforme (Stevens-Johnson syndrome), toxic epidermal necrolysis, and vasculitis; phlebitis; severe hypotension (with shock and cardiac arrest), wheezing, dyspnoea, urticariapruritus, flushing of the upper body (‘red man’ syndrome), pain, and muscle spasm of the back and chest on rapid infusion.

**Dose:** Serious staphylococcal infections, by intravenous infusion,adult, 500 mg over at least 60 minutes every 6 hours or 1 g over at least 100 minutes every 12 hours; elderly (over 65 years), 500 mg every 12 hours or 1 g once daily; neonate up to 1 week, 15 mg/kg initially, then 10 mg/kg every 12 hours; neonate 1 – 4 weeks,

15 mg/kg initially, then 10 mg/kg every 8 hours;childover 1 month, 10 mg/kg every 6 hours. Antibiotic-associated colitis, by mouth,adult, 125 – 500 mg every 6 hours for 7–10 days;child1 month–5 years, 5 mg/kg every 6 hours; child over 5 years, 62.5 mg every 6 hours. Intravenous infusion,adult, 1g g over at least 100 minutes, then gentamicin 120 mg at induction or 15 minutes before procedure.

**Vancomycin hydrochloride 500mg powder for inj CMS net price = 7.05 SDG, 1g powder for inj. = 13.8 SDG**

## 6.3Antituberculosis medicines

### 6.3.1.Cycloserine

Cycloserine is a complementary list medicine for the treatment of multidrug-resistant tuberculosis which should be used in specialized centres adhering to WHO standards for tuberculosis control.

**Cycloserine 250mg cap CMS net price = 3.000 SDG**

### 6.3.2.Ethambutol

**Indications:** Tuberculosis, in combination with other drugs.

**cautions:** Ocular examination recommended before and during treatment renal impairment (reduce dose and monitor plasma ethambutol concentration if creatinine clearance is less than 30 ml/minute.

**Contraindications:** Optic neuritis;children under 5 years (unable to report symptomatic visual disturbances); severe renal impairment.

**Side effects-:** Optic neuritis including reduced visual acuity and red/green colour blindness (early changes usually reversible; prompt withdrawal may prevent blindness); peripheral neuritis (especially in legs); gout; rarely rash, pruritus, urticaria, and thrombocytopenia. standards for tuberculosis control.

**Dose:**Tuberculosis (as part of a 6- or 8-month regimen; see introductory note and tables above), by mouth,adult, 15mg/kg daily or 30 mg/kg 3 times weekly;child, 20 mg/kg daily or 30 mg/kg 3 times a week.

**Ethambutol hydrochloride 400mg tablet CMS net price = 0.17 SDG**

### 6.3.3. Pyrazinamide

**Indicaions:** Tuberculosis, in combination with other drugs.

**Cautions:** Hepatic impairment monitor hepatic function; renal impairment diabetes mellitus (monitor blood glucose may change suddenly) gout.

**Contraindications:** severe hepatic impairment; porphyria.

**Dose: -** Tuberculosis (as part of a 6- or 8-month regimen; by mouth,adult and child, 25 mg/kg daily or 35 mg/kg 3 times weekly.

**Side effects:** hepatotoxicity including fever, anorexia, hepatomegaly, splenomegaly, jaundice, and liver failure; nausea, vomiting; flushing; dysuria; arthralgia; gout; sideroblastic anaemia; rash, photosensitivity.

**Pyrazinamide 500mg tablet CMS net price = 0.06 SDG**

### 6.3.4.Rifampicin

**Indications:** Tuberculosis, in combination with other drugs; leprosy; meningitis.

**Contraindications:** Hypersensitivity to rifamycins jaundice.

**cautions:** Hepatic impairment monitor liver function and blood counts in liver disorders, alcohol dependency, the elderly , and in those on prolonged therapy; renal impairment porphyria; discolours soft contact lenses; important: advise patients on hormonal contraceptives to use additional means

**Side-effects:** Severe gastrointestinal disturbances including anorexia, nausea, vomiting, and diarrhoea (antibiotic-associated colitis reported); headache, drowsiness; rash, fever, influenza-like syndrome and respiratory symptoms, collapse, shock, haemolytic anaemia, acute renal failure, and thrombocytopenic purpura (more frequent with intermittent therapy); alterations of liver function, jaundice, and potentially fatal hepatitis (dose related; do not exceed maximum dose of 600 mg daily); oedema, muscular weakness and myopathy, exfoliative dermatitis, toxic epidermal necrolysis, pemphigoid reactions, leukopenia, eosinophilia, and menstrual disturbances also reported; urine, tears, saliva, and sputum coloured orange-red.

**Dose:** Tuberculosis (as part of a 6- or 8-month regimen; by mouth,adultandchild, 10 mg/kg daily or 3 times weekly (maximum, 600 mg daily).

**Rifampicin 150 mg, 300 mg Capsule or tablet CMS net price = New item**

### 6.3.5.Rifampicin + isoniazid

**indications:** Tuberculosis, in combination with other drugs.

**Contraindications:** See under Isoniazid and Rifampicin.

**Cautions:** Combined preparation usually not suitable for use inchildren; see also under Isoniazid and Rifampicin.

**Side-effects:** See under Isoniazid and Rifampicin.

**Dose:** Tuberculosis (as part of a 6-month regimen; see introductory note and tables above), by mouth,adult, rifampicin, 10 mg/kg and isoniazid, 5 mg/kg daily. Tuberculosis (as part of a 6-month regimen; see introductory note and tables above), by mouth,adult, rifampicin, 10 mg/kg and isoniazid, 10 mg/kg, 3 times weekly.

**Rifampicin + isoniazid Tablet:300 mg + 150 mg CMS net price = 0.229 SDG**

### 6.3.6.Streptomycin

**Indications:** Tuberculosis, in combination with other drugs; tularaemia; plague; brucellosis.

**cautions:** Children (painful injection, avoid use if possible); renal impairment infants, and theelderly (adjust dose and monitor renal, auditory, and vestibular function, and plasma streptomycin concentrations).

**Contraindications:** Hearing disorders; myasthenia gravis; pregnancy.

**Side effects:** Vestibular and auditory damage, nephrotoxicity; hypersensitivity reactions (withdraw treatment); paraesthesia of mouth; rarely hypomagnesaemia on prolonged therapy; antibiotic-associated colitis; also, nausea, vomiting, and rash; rarely haemolytic anaemia, aplastic anaemia, agranulocytosis, and thrombocytopenia; pain and abscess at injection site.

**Dose:** Tuberculosis by deep intramuscular injection,adult and child, 15 mg/kg daily or 3 times weekly (patients over 60 years or those weighing less than 50 kg may not tolerate doses above 500–750 mg daily).

**Streptomycin Sulphate1gm CMS net price = 0.30 SDG**

## 6.4. Antifungal medicines

### 6.4.1Amphotericin B

**indications:** Life-threatening fungal infections including histoplasmosis, coccidioido mycosis, paracoccidioid omycosis, blastomycosis, aspergillosis, cryptococcosis, mucormycosis, sporotrichosis, and candidosis; leishmaniasis

**cautions:** Initial test dose required renal impairment ; monitor hepatic and renal function; blood counts, and plasma electrolyte concentrations (including potassium and magnesium concentration) pregnancy. Anaphylaxis rarely occurs with intravenous amphotericin B and a test dose is advisable before commencing the first infusion. The patient should beobserved for about 30 minutes after the test dose.

**Side effects:** Fever, headache, anorexia, weight loss, nausea and vomiting, malaise, diarrhoea, muscle and joint pain, dyspepsia, epigastric pain; renal function disturbances (including hypokalaemia, hypomagnesaemia, and renal toxicity); blood disorders; cardiovascular toxicity (including arrhythmias); neurological disorders (including peripheral neuropathy); abnormal liver function (discontinue treatment); rash; anaphylactoid reactions (see note above); pain and thrombophlebitis at injection site.

**Dose:** Systemic fungal infections, by intravenous infusion,adultandchild, initial test dose, 1 mg over 20–30 minutes, followed by 250 micrograms/kg daily, gradually increased up to 1 mg/kg daily, or in severe infection, up to 1.5 mg/kg daily or on alternate days.

**Amphotricin B 50mg powder for inj (lyophilized) CMS net price = 17.00 SDG**

## 6.5.Antiviral medicines

### 6.5.1Aciclovir

**Indications:** Treatment of primary genital herpes; disseminated and also varicella–zoster infections in immunocompromised patients; herpes simplex encephalitis; eye infections

**cautions:** Maintain adequate hydration; renal impairment ; pregnancy and breastfeeding

**Side effects:** Nausea, vomiting, abdominal pain, diarrhoea, headache, fatigue, rash, urticaria, pruritus, photosensitivity; very rarely hepatitis, jaundice, dyspnoea, neurological reactions (including dizziness, confusion, hallucinations, convulsions, and drowsiness), acute renal failure, anaemia, thrombocytopenia, and leukopenia;

on intravenous infusion, severe local inflammation (sometimes resulting in ulceration), and very rarely fever, agitation, tremor, and psychosis.

**Dose:** Treatment of herpes simplex (including genital herpes), by mouth,adultandchildover 2 years, 200 mg (400 mg in the immunocompromised or if absorption is impaired) 5 times daily, usually for 5 days (longer if new lesions appear during treatment or if healing is incomplete);child under 2 years, half the adult dose. Treatment of herpes simplex in the immunocompromised, severe initial genital herpes, by intravenous infusion , adult and child over 12 years, 5 mg/kg every 8 hours, usually for 5 days. Treatment of disseminated herpes simplex, by intravenous infusion, neonate and infant up to 3 months, 20 mg/kg every 8 hours for 10–14 days (21 days if CNS involvement); child 3months–12 years, 250 mg/m2 every 8 hours, usually for 5 days. Prevention of recurrent herpes simplex, by mouth,adult, 200 mg 4 times daily or 400 mg twice daily, reduced to 200 mg 2–3 times daily if possible and interrupted every 6–12 months for reassessment.Prophylaxis of the herpes simplex in the immunocompromised, by mouth,adult and child over 2 years, 200–400 mg 4 times daily;child under 2 years, half the adult dose. Treatment of chickenpox, by mouth,adult, 800 mg 4–5 times daily for 5–7 days;child under 2 years, 200 mg 4 times daily,child 2–5 years, 400 mg 4 times daily;child over 6 years, 800 mg 4 times daily. Treatment of herpes zoster, by mouth,adult, 800 mg 5 times daily for 7–10 days. Treatment of varicella–zoster, by intravenous infusion,adult and child over 12 years, 5 mg/kg every 8 hours, usually for 5–7 days (doubled in the immunocompromised); neonate and infent up to 3 months, 10–20 mg/kg every 8 hours for at least 7 days;child3 months–12 years, 250 mg/m2 every 8 hours usually for 5 days (doubled in the immunocompromised).Treatment of herpes simplex encephalitis, varicella–zoster in the immunocompromised, by intravenous infusion,adultandchildover 12 years, 10 mg/kg every 8 hours;child3 months–12 years, 500 mg/m2 every 8 hours; usually given for at least 10 days in encephalitis, possibly for 14 –21 days.

**Acyclovir Sodium 250mg powder for i.v infusion CMS net price Vail = 15.00-26.40 SDG**

## 6.6. Antiprotozoal drugs

### 6.6.1. Antimalarial medicines

#### 6.6.1.1.Artemether

**indications:** Treatment of severe *P. falciparum* malaria in areas where quinine is ineffective.

**Contraindications:** First trimester of pregnancy.

**cautions:** Dizziness may impair ability to perform skilled tasks, for example, operating machinery or driving.

**Side effects:** Headache, nausea, vomiting, abdominal pain, diarrhoea; dizziness, tinnitus, neutropenia, elevated liver enzyme values; cardiotoxicity (after high doses); neurotoxicity (in animal studies).

**Dose: -** Treatment of severe *P. falciparum* malaria (in areas of quinine resistance), by intramuscular injection,adult and child over 6 months, loading dose of 3.2 mg/kg, then 1.6 mg/kg daily until patient can tolerate oral medication or up to a maximum of 7 days; this is followed by a single dose of oral mefloquine 15 mg/kg (occasionally, 25 mg/kg if necessary) toeffect a radical cure.

**Artemether 40mg/ml for inj. CMS net price Ampoule = 1.00-1.08 SDG , 80 mg/1ml Ampoule = 1.25 SDG**

### 6.6.1.2. Artemether + lumefantrine

**Indications:** treatment of uncomplicated malaria caused by *P. falciparum* alone or with other Plasmodium spp. in areas with significant drug resistance.

**Contraindications:** breastfeeding ; history of arrhythmias, clinically relevant bradycardia, or congestive heart failure accompanied by reduced left ventricular ejection fraction; family history of sudden death or congenital prolongation of QT interval (see also Precautions).

**cautions:** first trimester of pregnancy electrolyte disturbances; concomitant administration of drugs that prolong the QT interval; monitor patients unable to take food (greater risk of recrudescence);. Dizziness may impair ability to perform skilled tasks, for example, operating machinery or driving.

**Side effects:** abdominal pain, anorexia, diarrhoea, nausea and vomiting; headache, dizziness, sleep disorders; palpitation; arthralgia, myalgia; cough; asthenia, fatigue; pruritus, rash.

**Dose:** Treatment of uncomplicated falciparum malaria: by mouth,adultandchildover 12 years/body weight over 35 kg, initially 4 tablets followed by 5 further doses of 4 tablets each at 8, 24, 36, 48, and 60 hours (total, 24 tablets over 60 hours).Child body weight 5–14 kg, initially 1 tablet followed by 5 further doses of 1 tablet each at 8, 24, 36, 48, and 60 hours (total, 6 tablets over 60 hours); body weight 15–24 kg, initially 2 tablets followed by 5 further doses of 2 tablets each at 8, 24, 36, 48, and 60 hours (total, 12 tablets over 60 hours); body weight 25–34 kg, initially 3 tablets followed by 5 further doses of 3 tablets each at 8, 24, 36, 48, and 60 hours (total, 18 tablets over 60 hours).

**Artemether + lumefantrine 20 mg +120 mg tablet CMS net price = 0.350 SDG**

### 6.6.1.3. Primaquine

**Indications:** Elimination of intrahepatic forms of *P. vivax* and *P.ovale* (after standard chloroquine therapy); elimination of gametocytes of *P. falciparum* (after standard therapy with a blood schizontocide).

**cautions:** Monitor blood count (if either methaemoglobinaemia or haemolysis occurs, withdraw treatment and consult a physician); G6PD deficiency (exclude before radical treatment for *P. vivax and P. ovale* malaria; however, this is not necessary before single-dose gametocytocidal

**Contraindications:** Pregnancy (treatment with primaquine should be delayed until after delivery; and breastfeeding ; conditions that predispose to granulocytopenia (including active rheumatoid arthritis and lupus erythematosus).

**Dose:**Radical treatment of *P. vivax* and *P. ovale* malaria (after standard chloroquine therapy), by mouth,adult, 250 micrograms/kg daily (or 15 mg daily) for 14 days;child, 250 micrograms/kg daily for 14 days; in G6PD deficiency,adult, 750 micrograms/kg once a week for 8 weeks;child, 500–750 micrograms/kg once a week for 8 weeks. Gametocytocidal treatment of *P. falciparum* malaria (after standard blood schizontocide therapy), by mouth,adultandchild, 500–50 micrograms/kg as a single dose.

**Side-effects:** Anorexia, nausea and vomiting, abdominal pain; acute haemolytic anaemia (frequently in G6PD deficiency); methaemoglobinaemia, haemoglobinuria, agranulocytosis, granulocytopenia and leukopenia.

**Primaquine Phosphate 15 mg tablet CMS net price = 0.070 SDG**

### 6.6.1.4. Quinine

**Indications:** Treatment of multidrug-resistant P. falciparum malaria, alone or in combination with other antimalarial drugs.

**cautions:** Atrial fibrillation, conduction defects, or heart block (monitor for signs of cardiac toxicity and blood glucose and electrolyte concentrations during intravenous use); pregnancy (but in acute malaria, benefit is usually considered to out-weigh risk.

**Contraindications:** Haemoglobinuria; optic neuritis; tinnitus; myasthenia gravis.

**Side effects:** Cinchonism (tinnitus, headache, blurred vision, temporary blindness, altered auditory acuity, nausea, diarrhoea, hot and flushed skin, rash, and

confusion); hypersensitivity reactions including angioedema; rarely haemorrhage and asthma; hypoglycaemia (especially after parenteral administration); renal damage (culminating in acute renal failure and anuria); blood disorders; cardiovascular, gastrointestinal, and central nervous system effects; very toxic in overdosage (immediate medical attention required).

**Dose:** Treatment of multidrug-resistant P. falciparum malaria, by mouth,adult, 600 mg (quinine sulfate) every 8 hours for 3, 7, or 10 days;child, 10 mg/kg (quinine sulfate) every 8 hours for 3, 7, or 10 days; duration of treatment depends on local susceptibility of P. falciparum and whether or not additional antimalarials are used.

**Quinine dihydrochloride 300mg/ml for inj CMS net price 2 ml Ampoule = 1.070 SDG**

### 6.6.1.5. Sulfadoxine + pyrimethamine

**Indications:** Treatment of falciparum malaria in combination with other antimalarials

**cautions:** Blood disorders (avoid unless specialist supervision is available and discontinue immediately if blood disorder occurs); rash, sore throat, mouth ulcers, or shortness of breath (withdraw treatment); G6PD deficiency; predisposition to folate deficiency; breastfeeding.

**Contraindications:** Hypersensitivity to sulfonamides or pyrimethamine; severe hepatic or renal impairment (except where no alternative treatments available).

**Side effects:** Rash, pruritus, slight hair loss; rarely erythema multiforme (Stevens-Johnson syndrome) and toxic epidermal necrolysis; gastrointestinal disturbances including nausea, vomiting, and stomatitis; rarely hepatitis, leukopenia, thrombocytopenia, megaloblastic anaemia, and purpura (withdraw treatment); fatigue, headache, fever, and polyneuritis also reported; pulmonary infiltrates such as eosinophilic or allergic alveolitis

**Dose:** Treatment of uncomplicated P. falciparum malaria (in combination with other antimalarials; see introductory note above), by mouth,adult, sulfadoxine 1.5 g + pyrimethamine 75 mg (3 tablets) as a single dose;child5–10 kg, half tablet;child11–20 kg, 1 tablet;child21–30 kg, 1½ tablets;child31–45 kg, 2 tablets, as a single dose.

**Sulfadoxine + pyrimethamine 500 mg + 25 mg tablet CMS net price = New item**

### 6.6.2. Leishmaniacides

#### 6.6.2.1.Sodiumstibogluconate

**Indications:** Treatment of leishmaniasis.

**Cautions:**Intravenous injections must be given slowly over 5 minutes (to reduce risk of local thrombosis) and stopped if coughing or substernal pain; mucocutaneous disease (see below); monitor ECG before and during treatment; heart disease (withdraw if conduction disturbances occur); treat intercurrent infection (e.g. pneumonia). Mucocutaneous disease Successful treatment of mucocutaneous leishmaniasis may induce severe inflammation around the lesions (may be life-threatening if pharyngeal or tracheal involvement)—may require corticosteroid

**Side-effects:** Anorexia, nausea, vomiting, abdominal pain, diarrhoea; ECG changes; coughing (see Cautions); headache, lethargy; arthralgia, myalgia; rarely jaundice, flushing, bleeding from nose or gum, substernal pain (see Cautions), vertigo, fever, sweating, and rash; also reported pancreatitis and anaphylaxis; pain and thrombosis on intravenous administration, intramuscular injection also painful

**Dose:** The dose of sodium stibogluconate is 20 mg/kg per day given by slow intravenous infusion (at least five minutes with cardiac monitoring). The injection should be stopped if there is coughing or central chest pain. The maximum licensed dose is 850 mg per day.

**Sodium Stibogluconate 100mg/1ml for inj equivalent to pentavalent antimony CMS net price 30ml vail = 49.00 SDG**

## 7-Antineoplastic, immunosuppressives and medicines used in palliative care

## 7.1. Immunosuppressive medicines

## 7.2.Cytotoxic medicines

## 7.3. Other immunomodulating drugs

## 7.1. Immunosuppressive medicines

### 7.1.1.Azathioprine

**Indication:** To prevent rejection in transplant recipients; rheumatoid arthritis ; inflammatory bowel disease.

**Contraindications:** Hypersensitivity to azathioprine and mercaptopurine; breastfeeding.

**Side effects:** Hypersensitivity reactions including malaise, dizziness, vomiting, fever, muscular pains, arthralgia, rash, hypotension, or interstitial nephritis call for immediate withdrawal; haematological toxicity including leukopenia and thrombocytopenia (reversible upon withdrawal); liver impairment, cholestatic jaundice; hair loss; increased susceptibility to infections and colitis in patients also receiving corticosteroids; nausea; rarely pancreatitis, pneumonitis, and hepatic veno-occlusive disease.

**Dose:**Transplant rejection, by mouth or by intravenous injection (over at least 1 minute and followed by 50 ml sodium chloride intravenous infusion) or by intravenous infusion,adult, up to 5 mg/kg on day of surgery, then reduced according to response to 1–4 mg/kg daily for maintenance.

**Azathioprine CMS net price = New item**

### 7.1.2.Ciclosporin

**Indication:** Prevention of rejection in kidney, liver, heart, or bone marrow transplantation; graft-versus-host disease; nephrotic syndrome.

**Cautions:** Monitor kidney function (dose-dependent increase in serum creatinine and urea during first few weeks post-transplant may necessitate dose reduction; exclude rejection in kidney transplant); monitor liver function (adjust dosage according to bilirubin and liver enzymes; monitor blood pressure (discontinue if hypertension cannot be controlled by antihypertensives); monitor serum potassium, particularly if marked renal impairment (risk of hyperkalaemia); monitor serum

magnesium; hyperuricaemia; measure blood lipids before and during treatment; avoid in porphyria; pregnancy and breastfeeding.

**Side-effect:** Dose-related and reversible increases in serum creatinine and urea unrelated to tissue rejection; burning sensation in hands and feet during initial therapy; electrolyte disturbances including hyperkalaemia, and hypomagnesaemia; hepatic dysfunction; hyperuricaemia; hypercholesterolaemia; hyperglycaemia, hypertension (especially in heart transplant patients); increased incidence of malignancies and lymphoproliferative disorders; increased susceptibility to infections due to immunosuppression; gastrointestinal disturbances; gingival hyperplasia; hirsutism; fatigue; allergic reactions; thrombocytopenia (sometimes with haemolytic uraemic syndrome); also mild anaemia, tremors, convulsions, neuropathy; dysmenorrhoea or amenorrhoea; pancreatitis, myopathy or muscle weakness; cramp; gout; oedema; headache.

**Dose:** Organ transplantation, by mouth,adult and child over 3 months, 10–15 mg/kg 4–12 hours before surgery, then 10–15 mg/kg daily for 1–2 weeks, reducing to 2–6 mg/kg daily for maintenance (adjust dose according to blood ciclosporin concentration and kidney function). Organ transplantation, by intravenous infusion over 2–6 hours,adult and child, one third of the corresponding dose by mouth. Bone marrow transplantation, graft-versus-host disease, by mouth, adult and child over 3 months, 12.5–15 mg/kg daily for 2 weeks, starting on the day before surgery, followed by 12.5 mg/kg daily for 3–6 months, then gradually tailed off (may take up to 1 year after transplant). Bone marrow transplantation, graft-versus-host disease, by intravenous infusion over 2–6 hours,adult and child over 3 months, 3–5 mg/kg daily for 2 weeks, starting on the day before surgery, followed by maintenance by mouth. Nephrotic syndrome, by mouth,adult, initially 5 mg/kg daily in 2 divided doses;child, initially 6 mg/kg daily in 2 divided doses; (reduce dose in renal impairment; maximum, 2.5 mg/kg daily); slowly reduced to lowest effective dose according to proteinuria and serum creatinine measurements for maintenance; discontinue after 3 months if no improvement (after 6 months in membranous glomerulonephritis).

**Ciclosporin cms net price 25 mg capsule = 0.750 SDG, 50 mg capsule = 1.241 SDG, 100mg = 2.300 SDG**

## 7.2.Cytotoxic medicines

The chemotherapy of cancer is complex and should be confined to specialists in oncology. Cytotoxic drugs have both anti-cancer activity and the potential to damage normal tissue; most cytotoxic drugs are teratogenic. Chemotherapy may be given with a curative intent or it may aim to prolong life or to palliate symptoms. In an increasing number of cases chemotherapy may be combined with radiotherapy or surgery or both as either neoadjuvant treatment (initial chemotherapy aimed at shrinking the primary tumour, thereby rendering local therapy less destructive or more effective) or as adjuvant treatment (which follows definitive treatment of the primary disease, when the risk of sub-clinical metastatic disease is known to be high). All cytotoxic drugs cause side-effects and a balance has to be struck between likely benefit and acceptable toxicity.

**Cautions and contraindications:** Treatment with cytotoxic drugs should be initiated only after baseline tests of liver and kidney function have been performed and baseline blood counts established. It may be necessary to modify or delay treatment in certain circumstances. The patient should also be monitored regularly during chemotherapy and cytotoxic drugs withheld if there is significant deterioration in bone marrow, liver or kidney function. Most cytotoxic drugs are teratogenic and should not be administered during pregnancy, especially in the first trimester. Contraceptive measures are required during therapy and possibly for a period after therapy has ended. Cytotoxic drugs are also contraindicated during breastfeeding. The risk of venous thromboembolism in cancer is increased by chemotherapy; prophylaxis against thromboembolism may be appropriate for patients receiving chemotherapy. Cytotoxic drugs should be administered with care to avoid undue toxicity to the patient or exposure during handling by the health-care provider. Local policies for the handling and reconstitution of cytotoxic drugs should be strictly adhered to; also all waste, including patient's body fluids and excreta (and any material contaminated by them) should be treated as hazardous. Extravasation of intravenously administered cytotoxic drugs can result in severe pain and necrosis of the surrounding tissue. If extravasation occurs, aspiration of the drug should first be attempted, then the affected limb is elevated and warm compresses applied to speed and dilute the infusion or it is localized by applying cold compresses until the inflammation subsides; in severe cases, hydrocortisone cream may be applied topically to the site of inflammation.

**Side- effect:** Cytotoxic drugs have a considerable potential to damage normal tissue. Specific adverse effects apply, but a number are common to all cytotoxics such as bone marrow and immunological suppression. Furthermore, the concomitant use of immunosuppressive drugs will enhance susceptibility to infections. Fever associated with neutropenia or immunosuppression requires

immediate treatment with antibiotics. Nausea and vomiting. Nausea and vomiting following administration of cytotoxic drugs and abdominal radiotherapy are often distressing and may compromise further treatment. Symptoms may be acute (occurring within 24 hours of treatment), delayed (first occurring more than 24 hours after treatment), or anticipatory (occurring before subsequent doses). Delayed and anticipatory symptoms are more difficult to control than acute symptoms and require different management .Susceptibility to drug-induced nausea and vomiting varies among patients; those more affected include women, patients under 50 years, anxious patients, and those who suffer from motion sickness. Repeated exposure to the cytotoxic therapy also increases susceptibility. Cytotoxic drugs associated with a low risk of emesis include etoposide, fluorouracil, low-dose methotrexate, and the vinca alkaloids; those with an intermediate risk include lower doses of cyclophosphamide, doxorubicin, and high dose methotrexate cisplatin, high-dose cyclophosphamide, and dacarbazine tend to have the highest risk of emesis. For patients at a low risk of emesis, pretreatment with an oral phenothiazine (for example, chlorpromazine), continued for up to 24 hours after chemotherapy, is often helpful. For patients at a higher risk, dexamethasone, 6–10 mg by mouth may be added before chemotherapy. For patients at a high risk of emesis or when other therapies are ineffective, high doses of intravenous metoclopramide may be used. Dexamethasone is the drug of choice for the prevention of delayed symptoms; it is used alone or in combination with metoclopramide .Good symptom control is the best way to prevent anticipatory symptoms and the addition of diazepam (sections 1.3 and 24.3) to antiemetic therapy is helpful because of its sedative, anxiolytic, and amnesic effects. Hyperuricaemia. Hyperuricaemia may complicate treatment of conditions such as non-Hodgkin lymphomas and leukaemia. Renal damage may result from the formation of uric acid crystals. Patients should be adequately hydrated and hyperuricaemia may be managed with allopurinol, initiated 24 hours before cytotoxic treatment and continued for 7–10 days afterwards.Alopecia. Alopecia is common during treatment with cytotoxic drugs. There is no drug treatment, but the condition often reverses spontaneously once treatment has stopped. Oral mucositis. Oral mucositis is common during cancer chemotherapy, particularly with fluorouracil, methotrexate, and the anthracyclines. Prevention of a sore mouth is important, because once it has developed treatment is muchless effective. Brushing teeth with a soft brush 2–3 times daily and rinsing the mouth frequently are probably the most effective preventative measures.Sucking ice-chips during short infusions of fluorouracil is helpful. Treatment involves regular use of saline mouthwashes. Generally mucositis is self-limiting, but it can be a focus for blood-borne infection in the absence ofgood oral hygiene. Any pain caused by mucositis should be dealt witheffectively.

**Doses:** 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. Because of the complexity of dosage regimens in the treatment of malignant disease, dose statements have been omitted from some of the drug entries in this chapter. However, even where dose statements have been provided, detailed specialist literature, individual hospital chemotherapy protocols, or local cancer networks should be consulted prior to prescribing, dispensing, or administering cytotoxic drugs.

## Cytotoxic drugs

### 7.2.1.Alkylating medicine

### 7.2.2.Cytotoxic antibiotics

### 7.2.3. Antimetabolites and related therapy

### 7.2.4.Vinca alkaloids and etoposide

### 7.2.5.Other antineoplastic medicines

### 7.2.6. Sex hormones and hormone antagonists in malignant disease

### 7.2.1.Alkylating medicine

### 7.2.1.1.Cyclophosphamide

**Indication:** Malignant lymphomas including non-Hodgkin lymphomas, lymphocytic lymphoma and burkitt lymphoma; multiple myeloma; leukaemias, mycosis fungoides; neuroblastoma; adenocarcinoma of the ovary; retinoblastoma; breast cancer.

**Contraindications:** See note above and consult specialist literature.

**Cautions:** See note above and consult specialist literature; renal impairment and hepatic impairment.

**Side effect:**See note above and consult specialist literature.

**Dose:**Consult specialist literature.

**Cyclophosphamide 200 mg powder for i.v inj CMS net price Vail = 13.570 SDG, 500 mg =21.200 SDG,1gm = 47.500 SDG, 50 mg tablet=1.400 SDG.**

### 7.2.1.2.Chlorambucil

**Indication:**Chronic lymphocytic leukaemia; some non-Hodgkin lymphomas; Hodgkin disease, and Waldenstrom (primary) macroglobulinaemia.

**Contraindications:**See note above and consult specialist literature Pregnancy and breastfeeding.

**Side effect: -** See note above

Dose:See note above and consult specialist literature.

**Chlorambucil** **2 mg tablet CMS net price = 3.00 SDG**

### 7.2.1.3.Ifosfamide

**Indications:**Extensive experience is available with these drugs, which are among the most widely used in cancer chemotherapy. They act by damaging DNA, thus interfering with cell replication. In addition to the side-effects common to many cytotoxic drugs ;there are two problems associated with prolonged usage. Firstly, gametogenesis is often severely affected. Secondly, prolonged use of these drugs, particularly when combined with extensive irradiation, is associated with a marked increase in the incidence of acute non-lymphocytic leukaemia.

**Contra-indications:**Urinary-tract obstruction; acute infection (including urinary-tract infection); urothelial damage.

**Side-effects:** See above; also drowsiness, confusion, disorientation, restlessness, psychosis; urothelial toxicity, renal toxicity ;less commonly severe encephalopathy; rarely diarrhoea, constipation, convulsions, anorexia, very rarely jaundice, thrombophlebitis, syndrome of inappropriate antidiuretic hormone secretion; acute pancreatitis, arrhythmias, and heart failure also reported.

**Dose:** See above

**Ifosfamide** **1gm / 50 ml CMS net price Vail = 19.530 SDG, 2gm/50ml = 47.500 SDG**

### 7.2.2.Cytotoxic antibiotics

### 7.2.2.1.Bleomycin

**Indication:** Adjunct to surgery and radiotherapy in palliative treatment of Hodgkin and non-Hodgkin lymphomas; reticulum cell sarcoma and lymphoma; carcinomas of the head, neck, larynx, cervix, penis, skin, vulva, testicles; embryonal cell carcinoma, choriocarcinoma, and teratoma; malignant effusions.

**Contraindications:** See note above and consult specialist literature; pregnancy and breastfeeding

**Side effect:** See note above and consult specialist literature.

**Dose:**Consult specialist literature.

**Bleomycin Sulphate 15 IU CMS net price Vail = 38.510 SDG**

### 7.2.2.2.Doxorubicin

**Indication:** Acute leukaemias; carcinomas of the breast, bladder, ovary and thyroid; neuroblastoma; Wilm tumour; non-Hodgkin and Hodgkin lymphomas; soft tissue sarcomas, osteosarcoma.

**Contraindications:** See note above and consult specialist literature.

**Cautions:** See note above and consult specialist literature; hepatic impairment.

**Side effect:** See note above and consult specialist literature.

**Dose:** Consult specialist literature.

**Doxorubicin Hydrochloride 10mg CMS net price vail= 10.930 SDG, 50 mg vail=37.330 SDG**

### 7.2.2.3.Epirubicin

**Indication:** Is structurally related to doxorubicin and clinical trials suggest that it is as effective in the treatment of breast cancer.

**Contraindications:** See note above and consult specialist literature

**Cautions**: See note above and consult specialist literature.

**Side effects:** See note above and consult specialist literature.

**Dose:** See note above Consult specialist literature.

**Epirubicin Hydrochloride 2 mg/ml for inj CMS net price 25 ml Vail = 120.750 SDG, 2mg/ml in 5 ml = 38.000 SDG**

### 7.2.2.4.Dactinomycin:

**Indication:** Trophoblastic tumours, Wilm tumour, Ewing sarcoma, rhabdomyosarcoma.

**Contraindications:** See note above and consult specialist literature; pregnancy and breastfeeding.

**Cautions:** See note above and consult specialist literature; hepatic impairment.

**Side effect:** See note above and consult specialist literature.

**Dose:** Consult specialist literature.

**Dactinomycin 500mcg CMS net price Vail = 13.000 SDG**

### 7.2.2.5.Daunorubicin

**Indication:** Acute leukaemias.

**Contraindications:** See note above and consult specialist literature; pregnancy and breastfeeding.

**Cautions:** See note above and consult specialist literature; renal impairment ; hepatic impairment.

**Side effects:** See note above and consult specialist literature.

**Dose:** Consult specialist literature.

**Daunorubicin Hydrochloride 2mg/ml for inj. CMS net price 10 ml = 12.500 SDG**

### 7.2.2.6.Mitomycin:

**Indication:** Treat upper gastro-intestinal and breast cancers and by bladder instillation for superficial bladder tumours.

**Side effect:** Prolonged use may result in permanent bone-marrow damage. It may also cause lung fibrosis and renal damage. It causes delayed bone-marrow toxicity and therefore it is usually administered at 6-weekly intervals.

**Contraindications:** See note above and consult specialist literature; pregnancy and breastfeeding.

**cautions:** See note above and consult specialist literature; renal impairment ; hepatic impairment.

**Side effects:** See note above and consult specialist literature.

**Dose:** See note above Consult specialist literature.

**Mitomycin 10 mg CMS net price = 12.500 SDG**

### 7.2.2.7.Melphalan

**Indications:** Is licensed for the treatment of multiple myeloma, polycythaemia vera,childhood neuroblastoma, advanced ovarian adenocarcinoma, and advanced breast cancer. Melphalan is also licensed for regional arterial perfusion in localised malignant melanoma of the extremities and localised soft-tissue sarcoma of the extremities.

**Side-effects:** see above

**Dose:** By mouth, multiple myeloma, dose may vary according to regimen; typical dose 150 micrograms/kg daily for 4 days, repeated every 6 weeks.

Polycythaemia vera, initially, 6–10 mg daily reduced after 5–7 days to 2–4 mg daily until satisfactory response then further reduce to 2–6 mg per week By intravenous injection *or* infusion and regional arterial perfusion.

**Melphalan 2mg tablet CMS net price = 2.990 SDG**

### 7.2.3. Antimetabolites and related therapy

### 7.2.3.1.Cytarabine

**Indication:** Acute lymphoblastic leukaemia;chronic myeloid leukaemia; meningeal leukaemia; erythroleukaemia; non-Hodgkin lymphomas.

**Contraindications:** See note above and consult specialist literature

**Cautions:** See note above and consult specialist literature; **Side effects:** See note above and consult specialist literature.

**Dose:** Consult specialist literature.

**Cytarabine 100 mg/ml CMS net price vail =6.790 SDG, 500mg/ml vail=21.170 SDG**

### 7.2.3.2.Fluorouracil

**Indication:** Carcinomas of the colorectum, breast, stomach, pancreas, cervix, prostate, ovary; and endometrium; liver tumours; head and neck tumours; actinic keratosis.

**Contraindications:** See note above and consult specialist literature; pregnancy and breastfeeding.

**Cautions:** See note above and consult specialist literature; hepatic impairment.

**Side effects:** See note above and consult specialist literature.

**Dose:** Consult specialist literature.

**Fluorouracil 250mg CMS net price Vail = 1.990 SDG, 500 mg = 4.010 SDG**

### 7.2.3.3.Mercaptopurine

**Indication:** Acute leukaemias; inflammatory bowel disease .

**Contraindications:** See note above and consult specialist literature; pregnancy and breastfeeding.

**Cautions:** See note above and consult specialist literature; renal impairment hepatic impairment

**Side effects:** See note above and consult specialist literature.

**Dose:** Consult specialist literature.

**Mercaptopurine 50 mg CMS net price = 0.360 SDG**

### 7.2.3.4.Methotrexate

**Indication: -** Carcinoma of the breast, head and neck, and lung; trophoblastic tumours; acute lymphoblastic leukaemia, meningeal leukaemia; non-Hodgkin lymphomas; advanced cases of mycosis fungoides; non-metastatic osteosarcoma; severe rheumatoid arthritis; Crohn disease.

**Contraindications:** See note above and consult specialist literature; pregnancy and breastfeeding.

**Cautions:** See note above and consult specialist literature; renal impairment; hepatic impairment.

**Side effects:** See note above and consult specialist literature.

**Dose:** Consult specialist literature.

**Methotrexate Sodium Salt 2.5 mg tablet CMS net price = 0.080 SDG, 50mg/2ml= 3.500 SDG**

### 7.2.3.5.Capecitabine:

**Indication:** Which is metabolised to fluorouracil, is given by mouth. It is licensed as monotherapy or combination therapy for adjuvant treatment of advanced colon cancer following surgery, for monotherapy or combination therapy of metastatic colorectal cancer, and for first-line treatment of advanced gastric cancer in combination with a platinum-based regimen. Capecitabine is also licensed for second-line treatment of locally advanced or metastatic breast cancer either in combination with docetaxel (where previous therapy included an anthracycline) or alone (after failure of a taxane and anthracycline regimen or where further anthracycline treatment is not indicated). For the role of capecitabine in the treatment of breast cancer.

**Side-effects:** See above and hand–foot (desquamative) syndrome; diarrhea.

**Dose:** Stage III colon cancer, adjuvant following surgery, monotherapy,adultover 18 years 1.25 g/$m^2$ twice daily for 14 days, subsequent courses repeated after a 7-day interval; recommended duration of treatment 6 months Stage III colon cancer, adjuvant following surgery, in combination therapy,adultover 18 years 0.8–1 g/$m^2$ twice daily for 14 days, subsequent courses repeated after a 7–day interval; recommended duration of treatment 6 months. Metastatic colorectal cancer, monotherapy,adultover 18 years 1.25 g/$m^2$ twice daily for 14 days, subsequent courses repeated after a 7-day interval .Metastatic colorectal cancer, in combination therapy,adultover 18 years 0.8–1 g/$m^2$ twice daily for 14 days, subsequent courses repeated after a 7-day interval .dvanced gastric cancer, in combination with a platinum-based regimen,adultover 18 years 0.8–1 g/$m^2$ twice daily for 14 days, subsequent courses repeated after a 7-day interval *or* 625 mg/$m^2$ twice daily given continuously. Locally advanced or metastatic breast cancer, monotherapy or in combination with docetaxel,adultover 18 years 1.25 g/$m^2$ twice daily for 14 days, subsequent courses repeated after a 7-day interval**.**

**Capecitabine CMS net price = New item**

### 7.2.3.6.Gemcitabine

**Indication:** Is used intravenously; it is given alone forelderly patients or for palliative treatment, or with cisplatin as first-line treatment for locally advanced or metastatic non-small cell lung cancer. It is also used in the treatment of locally advanced or metastatic pancreatic cancer. Combined with cisplatin, gemcitabine is also licensed for the treatment of advanced bladder cancer. Combined with carboplatin, gemcitabine is licensed for the treatment of locally advanced or metastatic epithelial ovarian cancer which has relapsed after a recurrence-free interval of at least 6 months following previous platinum-based therapy. Combined with paclitaxel, gemcitabine is also

licensed for the treatment of metastatic breast cancer which has relapsed after previous chemotherapy including an anthracycline . Gemcitabine is generally well tolerated but it can cause mild gastro-intestinal side-effects, musculoskeletal pain, influenza-like symptoms and rashes; renal impairment and pulmonary toxicity have also been reported. Haemolytic uraemic syndrome has been reported rarely and gemcitabine should be discontinued if signs of microangiopathic haemolytic anaemia occur.

**Contraindication:** See above

**Side-effects:** See above

**Dose:**See above.

**Gemcitabine Hydrochloride 200mg/5ml inj for i.v use (lyophilized) CMS net price vail =43.000 SDG, 1000 mg inj for i.v use (lyophilized) vail = 154.300 SDG**

### 7.2.3.7.Calcium folinate:

**Indication:** Antidote in high-dose methotrexate therapy (as a 'folate rescue'); inadvertent overdose of methotrexate; palliative treatment of advanced metastatic colorectal cancer (in combination with fluorouracil).

**Cautions:** Not for pernicious anaemia or other megaloblastic anaemias due to vitamin B12 deficiency; pregnancy and breastfeeding.

**Side effects:** Allergic reactions; pyrexia after parenteral administration.

**Dose:** Antidote to methotrexate (usually started 24 hours after administration of methotrexate), by intramuscular or intravenous injection or by intravenous infusion,adult and child, up to 120 mg in divided doses over 12–24 hours, then 12–15 mg by intramuscular injection, or 15 mg by mouth every 6 hours for 48– 72 hours.

**Calcium Folinate 50 mg CMS net price vail = 14.800 SDG**

### 7.2.4.Vinca alkaloids and etoposide

### 7.2.4.1.Vinblastine

**Indication:** Disseminated Hodgkin and non-hodgkin lymphomas; advanced testicular carcinoma, breast carcinoma; palliative treatment of Kaposi sarcoma; trophoblastic tumours.

**Cautions:** See note above and consult specialist literature; hepatic impairment.

**Contraindications:** See note above and consult specialist literature; pregnancy and breastfeeding ; intrathecal injection.

**Side effects:** See note above and consult specialist literature.

**Dose:**Consult specialist literature.

**Vinblastine Sulphate 10 mg powder for inj. for I.V only CMS net price vail=14.330 SDG**

### 7.2.4.2.Vincristine

**Indication:** Acute lymphoblastic leukaemia; neuroblastoma, Wilm tumour, and non-hodgkin lymphomas; rhabdomyosarcoma, ewing sarcoma; mycosis fungoides.

**Cautions:** See note above and consult specialist literature; hepatic impairment.

**Contraindications:** See note above and consult specialist literature; pregnancy and breastfeeding; intrathecal injection.

**Side effects:** See note above and consult specialist literature

**Dose:** Consult specialist literature.

**Vincristine 1mg powder for inj. for I.V only CMS net price vail=3.000 SDG, 2mg powder for inj. for I.V only vail = 10.680 SDG**

### 7.2.4.3.Etoposide

**Indication:** Refractory testicular tumours; lung cancer.

**Contraindications:** See note above and consult specialist literature; severe hepatic impairment; pregnancy and breastfeeding.

**cautions:** See note above and consult specialist literature.

**Side effects:** See note above and consult specialist literature.

**Dose:** Consult specialist literature.

**Etoposide 100mg/5 inj ml CMS net price vail=6.000 SDG**

### 7.2.5.Other antineoplastic medicines

#### 7.2.5.1.Asparaginase

**Indication:** Acute lymphoblastic leukaemia.

**Contraindications:** See note above and consult specialist literature; pregnancy and breastfeeding.

cautions: See note above and consult specialist literature.

**Side effects:** See note above and consult specialist literature.

**Dose:** Consult specialist literature.

**Asparaginase10000 IU CMS net price vail= 114.540 SDG**

#### 7.2.5.2.Cisplatin

**Indication:** Metastatic testicular tumours, metastatic ovarian tumours, advanced bladder carcinoma and other solid tumours, including lung, cervical, and head and neck cancers.

**Cautions:** See note above and consult specialist literature; renal impairment.

**Contraindications:** See note above and consult specialist literature; pregnancy and breastfeeding.

**Side effects:** See note above and consult specialist literature.

**Dose:** Consult specialist literature.

**Cisplatin 10mg CMS net price vail=5.100 SDG,50 mg/50 ml vail = 15.000 SDG**

#### 7.2.5.3.Dacarbazine

**Indication:** Metastatic malignant melanoma; Hodgkin disease.

**Contraindications:** See note above and consult specialist literature; pregnancy and breastfeeding.

**Cautions:** See note above and consult specialist literature; renal impairment and hepatic impairment.

**Side effects:** See note above and consult specialist literature.

**Dose:** Consult specialist literature.

**Dacarbazine 200 mg CMS net price vail =11.310 SDG**

### 7.2.5.4.Topotecan

**Indication:** Colorectal cancer in combination with fluorouracil and folinic acid or as monotherapy.

**Contraindications:**See above

**Side-effects:** Topotecan include gastro-intestinal effects (delayed diarrhoea requiring prompt treatment may follow irinotecan treatment), asthenia, alopecia, and anorexia.

**Dose:** See above.

**Topotecan Hydrochloride 1mg/ml CMS net price 2.5 ml vail = 99.088 SDG.**

### 7.2.5.5. Paclitaxel

**Indications:** Ovarian cancer (advanced or residual disease following laparotomy) in combination with cisplatin.

**Contraindications:** See note above and consult specialist.

**Cautions:** See note above and consult specialist

**Side effects:** see note above and consult specialist literature.

**Dose:** See above

**Paclitaxel 6mg/ml CMS net price 25ml vial= 98.000 SDG, 100mg/17ml vial= 95.230 SDG, 30mg/5ml Vail = 33.740 SDG**

### 7.2.5.6 Docetaxel

**Indications**: Adjuvant treatment of operable node-positive and operable node-negative breast cancer.

**Cautions:** See note above and consult specialist literature

**Contraindications**: See note above and consult specialist literature; pregnancy and breastfeeding.

**Side -effects:** See note above and consult specialist literature.

**Dose:** see above.

**Docetaxel 20mg/0.5ml CMS net price vial= 49.130 SDG, 80mg/2ml vial=187.990 SDG**

### 7.2.5.7 Oxaliplatin

**Indications:** Metastatic colorectal cancer in combination with fluorouracil and folinic acid; colon cancer.

**Cautions:** See note above and consult specialist literature; renal impairment and hepatic impairment.

**Contraindications**: See note above and consult specialist literature; pregnancy and breastfeeding.

**Side effects:** See note above and consult specialist literature.

**Dose:** See above.

**Oxaliplatin 2mg/ml CMS net price 50ml vail= 54.020 SDG**

### 7.2.6.Sex hormones and hormone antagonists in malignant disease

### 7.2.6.1. Bicalutamide

**Indications: -** Prostate cancer.
**Side-effects:** Nausea, diarrhoea, hypersensitivity reactions including angioneurotic oedema and urticaria; rarely cardiovascular disorders (including angina, heart failure, and arrhythmias), and hepatic failure
**Dose:**150 mg once daily, Advanced prostate cancer, in combination with gonadorelin analogue or surgical castration, 50 mg once daily (started at the same time as surgical castration or at least 3 days before gonadorelin therapy.

**Bicalutamide 50 mg tablet CMS net price = 15.23704 SDG**

### 7.2.6.2. Letrozole:

**Indications:** Adjuvant treatment of oestrogen-receptor-positive early breast cancer in postmenopausal women; advanced breast cancer in postmenopausal women .

**Cautions:** Susceptibility to osteoporosis (assess bone mineral density before treatment and at regular intervals)

**Contra-indications:** Not indicated for premenopausal women.

**Side-effects:** Hot flushes, nausea, vomiting, fatigue, dizziness, headache, dyspepsia, constipation, diarrhoea, depression, anorexia, appetite , alopecia, increased sweating, rash, peripheral oedema, musculoskeletal pain, osteoporosis, bone fracture; palpitation, tachycardia, dyspnoea, cough, drowsiness, insomnia, anxiety, memory impairment, dysaesthesia, taste disturbance, pruritus, dry skin, urticaria, thrombophlebitis, abdominal pain, urinary frequency, urinary-tract infection, vaginal bleeding, vaginal discharge, breast pain, pyrexia, mucosal dryness, stomatitis, cataract, eye irritation, blurred vision, tumour pain, arthritis, leucopenia, general oedema; rarely pulmonary embolism, arterial thrombosis, cerebrovascular infarction.

**Dose:** 2.5 mg daily.

**Letrozole 2.5mg film coated tablet CMS net price = 8.480 SDG.**

### 7.2.6.3. Triptorelin

**Indications:** Advanced prostate cancer.

**Contra-indications:** Gonadorelin analogues are contra-indicated for use longer than 6 months in the treatment of endometriosis (do not repeat) and when there is unexplained vaginal bleeding.

**Side-effects:** Gastro-intestinal disturbances; in precocious puberty, withdrawal bleeding in females may occur in the first month of treatment; asthenia.

**Triptorelin Acetate 4.12 mg CMS net price Ampoule = 450.000 SDG**

## 7.3. Other immunomodulating drugs

### 7.3.1.Interferon alfa

**Indications:** Has shown some antitumour effect in certain lymphomas and solid tumours. Interferon alfa preparations are also used in the treatment of chronic hepatitis B, and chronic hepatitis C ideally in combination with ribavirin

**Side-effects:** Dose-related, but commonly include anorexia, nausea, diarrhoea, influenza-like symptoms, and lethargy. Ocular side-effects and depression (including suicidal behaviour) have also been reported. Myelosuppression may occur, particularly affecting granulocyte counts. Cardiovascular problems (hypotension, hypertension, palpitation, and arrhythmias), nephrotoxicity and hepatotoxicity have been reported. Hypertriglyceridaemia, sometimes severe, has been observed; monitoring of lipid concentration is recommended. Other side-effects include hypersensitivity reactions, thyroid abnormalities, hyperglycaemia, alopecia, psoriasiform rash, confusion, coma and seizures (usually with high doses in the elderly ).

**Interferon alfa 3000000 IU for inj. CMS net price Vail = 13.000 SDG**

## 8-Nutrition and Blood products and plasma substitute

### 8.1.Antianaemia medicines

### 8.2.Vitamins

### 8.3.Medicines affecting coagulation.

### 8.4. Plasma substitutes

### 8.1.Antianaemia medicines

#### 8.1.1.Ferrous salt

**Indications:** Iron-deficiency anaemia.

**Cautions:** Should not be administered for longer than 6 months; pregnancy; peptic ulcer, regional enteritis, ulcerative colitis, intestinal strictures, diverticula.

**Contraindications:** Haemosiderosis, haemochromatosis; any form of anaemia not caused by iron deficiency; patients receiving repeated blood transfusions; parenteral iron therapy.

**Sde effects:** Constipation, diarrhoea, dark stools, nausea, epigastric pain, gastrointestinal irritation; long-term or excessive administration may cause haemosiderosis.

**Dose:**Iron-deficiency anaemia, by mouth,adult, elemental iron, 100–200 mg daily in divided doses. Prevention of iron-deficiency anaemia (in those at particular risk), by mouth,adult(woman), elemental iron 60 mg daily;childunder 5 years, elemental iron, 2 mg/kg daily (maximum, 30 mg),childover 5 years, elemental iron, 30 mg daily; in women andchildren over 5 years, folic acid may also be given.

**Ferrous Salt CMS net price= New item**

#### 8.1.2.Ferrous salt + folic acid

**Indications:** Prevention of iron and folic acid deficiencies in pregnancy.

**Side effects:** Constipation, diarrhoea, dark stools, nausea, epigastric pain, gastrointestinal irritation; long-term or excessive administration may cause haemosiderosis.

**Dose:** Severe anaemia, by mouth, adult, elemental iron, 120 mg + folic acid 400 micrograms daily for 3 months child under 2 years, elemental iron, 25 mg + folic

acid 100–400 micrograms daily for 3 months child2–12 years, elemental iron 60 mg + folic acid, 400 micrograms daily for 3 months. Prevention of iron and folate deficiencies in pregnancy, by mouth adult, elemental iron, 100 mg + folic acid, 350–400 micrograms daily throughout pregnancy.

**Ferrous salt 150 mg + folic acid 0.5 mg capsule CMS net price = 0.180 SDG**

### 8.1.3.Folic acid

**Indications:** Treatment of folate-deficiency megaloblastic anaemia; prevention of neural tube defects in pregnancy.

**cautions:** Women receiving antiepileptic therapy (need counselling before starting folic acid

**Contraindications:** Should never be given without vitamin B12 in undiagnosed megaloblastic anaemia or other vitamin B12 deficiency states because of the risk of precipitating subacute combined degeneration of the spinal cord; folate-dependent malignant disease.

**Dose:** Treatment of folate-deficiency, megaloblastic anaemia, by mouth adult 5 mg daily for 4 months (in pregnancy continued to term); up to 15 mg daily may be necessary in malabsorption states.

**Folic acid 5 mg tablet CMS net price = 0.030 SDG**

### 8.1.4.Erythropoietins

**Indications:** Treat symptomatic anaemia associated with erythropoietin deficiency in deficiency in chronic renal failure.

**Contra-indications**: Pure red cell aplasia following erythropoietin therapy ; uncontrolled hypertension; patients unable to receive thromboprophylaxis; avoid injections containing benzyl alcohol in neonates .

**Side-effects:** Diarrhoea, nausea, vomiting; dose-dependent increase in blood pressure or aggravation of hypertension; in isolated patients with normal or low blood pressure, hypertensive crisis with encephalopathy-like symptoms and generalised tonic-clonic seizures requiring immediate medical attention; headache; dose-dependent increase in platelet count (but thrombocytosis rare) regressing during treatment; influenza-like symptoms (may be reduced if intravenous injection given over 5 minutes); cardiovascular events; shunt thrombosis especially if tendency to hypotension or arteriovenous shunt complications; very rarely sudden loss of efficacy because of pure

red cell aplasia, particularly following subcutaneous administration in patients with chronic renal failure (discontinue erythropoietin therapy), hyperkalaemia, hypersensitivity reactions (including anaphylaxis and angioedema), skin reactions, injection-site reactions, and peripheral oedema also reported.

**Dose:** Symptomatic anaemia associated with chronic renal failure in patients on haemodialysis ,by intravenous injection over 1–5 minutes or by subcutaneous injection (max.1 mL per injection site), initially 50 units/kg 3 times weekly adjusted according to response in steps of 25 units/kg 3 times weekly at intervals of at least 4 weeks; maintenance dose, usually a total of 75–300 units/kg weekly (as a single dose or in divided doses);childby intravenous injection initially as foradults; maintenance dose, body-weight under 10 kg usually 75–150 units/kg 3 times weekly, body-weight 10–30 kg usually 60–150 units/kg 3 times weekly, body-weight over 30 kg usually 30–100 units/kg 3 times weekly . Symptomatic anaemia associated with chronic renal failure inadults on peritoneal dialysis, by intravenous injection over 1–5 minutes or by subcutaneous injection initially 50 units/kg twice weekly; maintenance dose 25–50 units/kg twice weekly. Severe symptomatic anaemia of renal origin inadults with renal insufficiency not yet on dialysis, by intravenous injection over 1–5 minutes or by subcutaneous injection initially 50 units/kg 3 times weekly increased according to response in steps of 25 units/kg 3 times weekly at intervals of at least 4 weeks; maintenance dose 17-33 units/kg 3 times weekly; max. 200 units/kg 3 times weekly**.**

**Erythropoietins 2000 IU/ml CMS net price = 18.000 SDG , 4000 IU/ml = 30.470 SDG**

### 8.1.5.Hydroxocobalamin

**Indications:** Megaloblastic anaemias due to vitamin B12 deficiency.

**Side-effects:** Nausea, headache, dizziness; fever, hypersensitivity reactions including rash and pruritus; pain at injection site; hypokalaemia during initial treatment.

**Dose:** Megaloblastic anaemia without neurological involvement, by intramuscular injection,adult and child, initially 1 mg 3 times a week for 2 weeks, then 1 mg every 3 months.Megaloblastic anaemia with neurological involvement, by intramuscular injection,adult and child, initially 1 mg on alternate days until no further improvement occurs, then1 mg every 2 months. Prophylaxis of macrocytic anaemias, by intramuscular injection, adult and child, 1 mg every 2–3 months. Tobacco amblyopia and Leber optic atrophy, by intramuscular injection, adult and child, 1 mg daily for 2 weeks, then 1 mg twice weekly until no further improvement, then 1 mg every 1–3 months.

**Hydroxocobalamin 1mg /1ml CMS net price = 30.470 SDG.**

## 8.2.Vitamins

### 8.2.1.Alfacalcidol (1α-Hydroxycholecalciferol)

**Indications:** Prevention and treatment of simple vitamin D deficiency; treatment of vitamin D deficiency caused by malabsorption or chronic liver disease; hypocalcaemia associated with hypoparathyroidism.

**Contraindications:** ypercalcaemia; 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 pruritus, rash, and urticaria.

**Dose:** By mouth or by intravenous injection over 30 seconds,adult and child over 20 kg, initially 1 microgram daily elderly 500 nanograms), adjusted to avoid hypercalcaemia; maintenance, usually 0.25–1 microgram daily; neonate and preterm neonate initially 50-100 nanograms/kg daily.

**Alfacalcidol 0.20 mcg capsule CMS net price = 0.170 SDG, 1mcg capsule=0.590 SDG,2mcg/ml in 10 ml oral drop= 29.00 SDG**

### 8.2.2.Vitamine A

**Indication:** Prevention and treatment of vitamin A deficiency; prevention of complications of measles.

**Sid- effects:** No serious or irreversible adverse effects at the recommended doses; high intake may cause birth defects; transient increased intracranial. pressure inadults or a tense and bulging fontanelle in infants massive overdose can cause rough skin, dry hair, enlarged liver, raised erythrocyte sedimentation rate, raised serum calcium, and raised serum alkaline phosphatase concentrations.

**Dose:** Prevention of vitamin A deficiency by mouth adult, 200000 IU every 6 months adult (pregnant woman), maximum of 10 000 IU daily or maximum 25 000 IU weekly adult (woman ofchild-bearing age), 200 000 IU at delivery or within 8 weeks of delivery; infant under 6 months, 50 000 IU; infant 6–12 months, 100 000 IU every 4–6 months, preferably at measles vaccination;child over 1 year (preschool), 200 000 IU every 4–6 months.

**Viamitne A CMS net price= New item**

### 8.2.3.Vitamin K

**Indications:** Vitamin K is necessary for the production of blood clotting factors and proteins necessary for the normal calcification of bone.

**Dose:** Vitamin K (as phytomenadione) 1 mg may be given by a single intramuscular injection at birth; this prevents vitamin K deficiency bleeding in virtually all babies. For preterm neonates, see Alternatively, in healthy babies who are not at particular risk of bleeding disorders, vitamin K may be given by mouth, and arrangements must be in place to ensure the appropriate regimen is followed. Two doses of a colloidal (mixed micelle) preparation of phytomenadione 2 mg should be given by mouth in the first week, the first dose being given at birth and the second dose at 4–7 days. For exclusively breast-fed babies, a third dose of colloidal phytomenadione 2 mg is given by mouth at 1 month of age; the third dose is omitted in formula-fed babies because formula feeds contain adequate vitamin K. An alternative regimen is to give one dose of phytomenadione 1 mg by mouth at birth (using the contents of a phytomenadione capsule, to protect from the risk of vitamin K deficiency bleeding in the first week; for exclusively breast-fed babies, further doses of phytomenadione 1 mg are given by mouth (using the contents of a phytomenadione capsule) at weekly intervals for 12 weeks.

**Phytomenadione 10 mg/ ml CMS net price Ampule=0.400 SDG**

### 8.2.4.Calcium gluconate:

**Indication:** Hypocalcaemic tetany.

**Contraindications:** Associated with hypercalcaemia and hypercalciuria (for example, some forms of malignant disease).

**Side effects:** Gastrointestinal disturbances; bradycardia, arrhythmia; injection-site reactions; peripheral vasodilation; fall in blood pressure.

**Dose:** Hypocalcaemic tetany, by slow intravenous injection adult, 1 g (2.2 mmol) followed by about 4 g (8.8 mmol) daily by continuous intravenous infusion.

**Calcium gluconate 100 mg/ml CMS net price 10 ml Ampule= 2.00 SDG**

## 8.3.Medicines affecting coagulation.

### 8.3.1. Heparin sodium

**Indications:** Treatment and prophylaxis of deep-vein thrombosis and pulmonary embolism; unstable angina ischaemic stroke.

**Contraindications:** Hypersensitivity heparin; haemophilia and other haemorrhagic disorders, thrombocytopenia, peptic ulcer, recent cerebral haemorrhage, severe hypertension, severe liver or renal disease; after major trauma or recent surgery (especially to eye or nervous system); acute bacterial endocarditis.

**Side effect:** Immune-mediated thrombocytopenia usually develops 6–10 days after commencement of therapy (requires immediate withdrawal of heparin); haemorrhage, skin necrosis, hypersensitivity reactions including urticaria, angioedema, and anaphylaxis; osteoporosis after prolonged use and rarely alopecia.

**Dose:** Treatment of deep-vein thrombosis and pulmonary embolism, by intravenous injection,adult, loading dose of 5000 IU (10,000 IU in severe pulmonary embolism) followed by continuous intravenous infusion of 15–25 IU/kg/hour or by subcutaneous injection of 15,000 IU every 12 hours; laboratory monitoring is essential, preferably on a daily basis and dose adjusted accordingly; by intravenous injection, Smalladultandchild, lower loading dose, then by continuous intravenous infusion, 15–25 IU/kg/hour or by subcutaneous injection, 250 IU/kg every 12 hours. Prophylaxis in general surgery, by subcutaneous injection,adult, 5000 IU 2 hours before surgery, then every 8–12 hours for 7 days or until patient is ambulant (monitoring not needed); pregnant woman, 5000–10,000 IU every 12 hours.

**Heparin sodium 5000 IU/ml CMS net price 5 ml vail = 11.540 SDG**



### 8.3.2. Warfarin

**Indications:** Prophylaxis of embolization in rheumatic heart disease and atrial fibrillation; prophylaxis of thrombi formation after insertion of prosthetic heart valve; prophylaxis and treatment of venous thrombosis and pulmonary embolism; transient ischaemic attacks.

**Contraindications:** Pregnancy; peptic ulcer, severe hypertension, bacterial endocarditis.

**Side effect:** Haemorrhage; hypersensitivity, rash, alopecia, diarrhoea, unexplained drop in haematocrit, “purple toes”, skin necrosis, jaundice, hepatic dysfunction, nausea, vomiting, pancreatitis.

**Dose:** Usual induction dose, 10 mg daily for 2 days, according to the individual patient; the subsequent dose depends upon the prothrombin time; the usual daily maintenance dose, 3–9 mg daily taken at the same time each day.

**Warfarin 1 mg tablet CMS net price = 0.04 SDG, 3 mg tablet = 0.100 SDG, 5 mg tablet = 0.130 SDG**

### 8.3.3. Protamine sulfate

**Indications:** Antidote to overdosage with heparin sodium.

**Side-effect:** Nausea, vomiting, lassitude, flushing, hypotension, bradycardia, dyspnoea, allergic reactions including angioedema and anaphylaxis.

**Dose:** Heparin overdose, by intravenous injection over approximately 10 minutes,adult, 1 mg neutralizes 80–100 IU heparin sodium when given within 15 minutes; if longer time, less protamine is needed as heparin is rapidly excreted.

**Protamine sulfate 10mg/ml for inj CMS net price 5 ml vail = 15.200 SDG**

### 8.3.4. Blood coagulation factors

Factor VIII is essential for blood clotting and the maintenance of effective haemostasis; von Willebrand factor is a mediator in platelet aggregation and also acts as a carrier for factor VIII. Blood coagulation factors VII, IX, and X are essential for the conversion of factor II (prothrombin) to thrombin. Deficiency in any of these factors results in haemophilia. Bleeding episodes in haemophilia require prompt treatment with replacement therapy. Factor VIII, used for the treatment of haemophilia A, is a sterile freeze-dried powder containing the blood coagulation factor VIII fraction prepared from pooled human venous plasma. Standard factor VIII preparations also contain von Willebrand factor and may be used to treat von Willebrand disease. Highly purified preparations, including recombinant factor VIII, are available; they are indicated for the treatment of haemophilia A but do not contain sufficient von Willebrand factor for use in the management of von Willebrand disease. Factor IX complex is a sterile freeze-dried concentrate of blood coagulation factors II, VII, IX, and X derived from fresh venous plasma. Factor IX complex, which is used for the treatment of haemophilia B may also be used for the treatment of bleeding due to deficiencies of factor II, VII, and X. High purity preparations of factor IX which do not contain clinically effective amounts of factor II, VII, and X are available. A recombinant factor IX preparation is also available.

### 8.3.4. 1.Factor IX Complex (Coagulation Factors, II, VII, IX, X) Concentrate

**Indication:** Replacement therapy for factor IX deficiency in haemophilia B; bleeding due to deficiencies of factors II, VII, or X.

**Contraindications:** Disseminated intravascular coagulation.

**Side effect:** Allergic reactions including chills, and fever.

**Dose:**HaemophiliaB, by slow intravenous infusion, adult and child, according to patient's needs and specific preparation used. Treatment of bleeding due to deficiencies in factor II, VII or X as well as IX, by slow intravenous infusion,adultandchild, according to patient's needs.

**Factor IX Complex Concentrate 500 IU CMS net price = 638.280 SDG**

### 8.3.4. 2.Factor VIII concentrate:

**Indication:** Control of haemorrhage in haemophilia A.

**Side effect:** Allergic reactions including chills, fever.

**Dose:** HaemophiliaA, by slow intravenous infusion, adult and child, according to patient's**.**

**Factor VIII concentrate 250 IU CMS net price vail = 250.000SDG, 500 IU vail = 564.000 SDG**

## 8.4. Plasma substitutes

### 8.4.1.1.Dextran

**Indication:** Short-term blood volume expansion.

**Contraindications:** Severe congestive heart failure; renal failure; bleeding disorders such as thrombocytopenia and hypofibrinogenaemia. 30%; where possible, monitor central venous pressure; can interfere with blood group cross-matching and biochemical tests (take samples before start of infusion); monitor for hypersensitivity reactions; pregnancy.

**Side effect:** Hypersensitivity reactions including fever, nasal congestion, joint pains, urticaria, hypotension, bronchospasm, and rarely, severe anaphylactoid reactions; transient increase in bleeding time.

**Dose:** Short-term blood volume expansion, by rapid intravenous infusion,adult, 500–1000 ml initially, followed by a further 500 ml if necessary (total dosage should not exceed 20 ml/kg during the initial 24 hours); if required 10 ml/kg daily may be given for a further 2 days (treatment should not continue for longer than 3 days);child, total dosage should not exceed 20 ml/kg.

**Dextran 20 mg/ml CMS net price 2 ml Ampoule =1.700 SDG**

## 9-Gastrointestinal medicines

## 9.1. Antacids and other antiulcer medicines

## 9.2.Antiemetic medicines

## 9.1. Antacids and other antiulcer medicines

### 9.1.1.Aluminium hydroxide

**Indication:** Ulcer and non-ulcer dyspepsia; gastro-oesophageal reflux disease; hyperphosphataemia.

**Contraindications:** Hypophosphataemia; gastrointestinal or rectal bleeding; appendicitis; porphyria.

**Side effects:** Constipation; intestinal obstruction (with large doses); hypophosphataemia with increased bone resorption, hypercalciuria, and increased risk of osteomalacia (more common in patients on a low phosphate diet or on prolonged therapy); hyperaluminaemia resulting in osteomalacia, encephalopathy, dementia, and microcytic anaemia (in chronic renal failure treated with aluminium hydroxide as phosphatebinding agent).

**Dose:** Dyspepsia, gastro-oesophageal reflux disease, by mouth,adult, 1–2 tablets chewed 4 times daily and at bedtime or 5–10 ml suspension 4 times daily, between meals and at bedtime;child6–12 years, 5 ml up to 3 times daily. Hyperphosphataemia, by mouth,adult, 2–10 g daily in divided doses with meals.

**Aluminium hydroxide CMS net price= New item**

### 9.1.2.Magnesium hydroxide

**Indication:** Ulcer and non-ulcer dyspepsia; gastro-oesophageal reflux disease.

**Contraindications:** Severe renal impairment.

**Side effects:** diarrhoea; hypermagnesaemia resulting in loss of deep tendon reflexes and respiratory depression, along with other symptoms including nausea, vomiting, flushing of skin, thirst, hypotension, drowsiness, confusion, muscle weakness, bradycardia, coma, and cardiac arrest (in renal impairment).

**Dose:** Dyspepsia, gastro-oesophageal reflux disease, by mouth,adult, 5–10 ml repeated according to patient's needs.

**Magnesium hydroxide CMS net price = New item**

### 9.1.3.Ranitidine

**Indication:** Benign gastric and duodenal ulceration, gastro-oesophageal reflux disease, Zollinger–Ellison syndrome; other conditions where gastric acid reduction is beneficial.

**Contraindications:** porphyria.

**Side effects:** Diarrhoea and other gastrointestinal disturbances, headache, dizziness, rash, tiredness, acute pancreatitis, bradycardia, atrioventricular block, confusion, depression; rarely hallucinations (particularly in theelderly or the very ill), hypersensitivity reactions (including fever, arthralgia, myalgia, and anaphylaxis), blood disorders (including agranulocytosis, leukopenia, pancytopenia, and thrombocytopenia), hepatitis, tachycardia, agitation, visual disturbances, erythema multiforme, alopecia, gynaecomastia, and impotence; very rarely interstitial nephritis.

**Dose:** Benign gastric and duodenal ulceration, by mouth,adult, 150 mg twice daily or 300 mg at night for 4–8 weeks (up to 6 weeks in chronic episodic dyspepsia and up to 8 weeks in NSAIM-associated ulceration; in NSAIM-associated duodenal ulceration, 300 mg can be given twice daily for 4 weeks to achieve a higher healing rate);child (peptic ulcer), 2–4 mg/kg twice daily (maximum, 300 mg daily). Benign gastric and duodenal ulceration, reflux oesophagitis, Zollinger–Ellison syndrome, by intramuscular injection,adult, 50 mg every 6–8 hours; by slow intravenous injection,adult, 50 mg diluted to 20 ml and given over at least 2 minutes (may be repeated every 6–8 hours); by intravenous infusion,adult, 25 mg/hour for 2 hours (may be repeated every 6–8 hours). Duodenal ulceration associated with H. pylori, see note above. Prophylaxis of NSAIM-induced gastric or duodenal ulcer, by mouth,adult, 300 mg twice daily. Gastro-oesophageal reflux disease, by mouth,adult, 150 mg twice daily or 300 mg at night for up to 8 weeks, or if necessary, 12 weeks, increased in moderate to severe disease to 600 mg daily in 2–4 divided doses for up to 12 weeks. Long-term treatment of healed gastro-oesophageal reflux disease, by mouth,adult, 150 mg twice daily. Zollinger–Ellison syndrome, by mouth,adult, 150 mg 3 times daily; up to 6 g daily in divided doses has been used. Gastric acid reduction (prophylaxis of acid aspiration) in obstetrics, by mouth,adult, 150 mg at onset of labour, then every 6 hours. Surgical procedures, by intramuscular or slow intravenous injection,adult, 50 mg 45–60 minutes before induction of anaesthesia (intravenous injection diluted to 20 ml and given over at least 2 minutes); by mouth,adult, 150 mg 2 hours before induction of anaesthesia, and also, when possible, on the preceding evening. Prophylaxis of stress ulceration, by slow intravenous injection,adult, initially 50 mg diluted to 20 ml and given over at least 2 minutes, then 125–250 micrograms/kg per hour by continuous intravenous infusion (may be followed by 150 mg twice daily by mouth when oral feeding commences).

**Ranitidine 150 mg tablet CMS net price = 0.110 SDG, 50 mg/2 ml Ampoule =1.125 SDG**

## 9.2.Antiemetic medicines

### 9.2.1.Metoclopramide

**Indication:** Nausea and vomiting in gastrointestinal disorders, in migraine , and following surgery and treatment with cytotoxics or radiotherapy; gastro–oesophageal reflux disease ; premedication; aid to gastrointestinal intubation; gastroparesis.

**Contraindications:** Gastrointestinal obstruction and also haemorrhage or perforation; 3–4 days after gastrointestinal surgery; convulsive disorders; phaeochromocytoma.

**Side-effects:** Extrapyramidal symptoms (especially in children and young adults; see introductory note above); tardive dyskinesias on prolonged use; hyperprolactinaemia; drowsiness, restlessness, dizziness, headache, diarrhoea, depression, hypotension and hypertension reported; rarely neuroleptic malignant syndrome; rash, pruritus, oedema; cardiac conduction abnormalities following intravenous administration; rarely methaemoglobinaemia (more severe in G6PD deficiency).

**Dose:** Nausea and vomiting, gastro-oesophageal reflux disease, gastroparesis, by mouth, by intramuscular injection, or by slow intravenous injection (over 1–2 minutes), adult, 10 mg 3 times daily; young adult15–19 years (under 60 kg), 5 mg 3 times daily;childup to 1 year (up to 10 kg), 1 mg twice daily;child1–3 years (10–14 kg), 1 mg 2–3 times daily child3–5 years (15–19 kg), 2 mg 2–3 times daily;child5–9 years (20–29 kg), 2.5 mg 3 times daily child 9–14 years (30 kg and over), 5 mg 3 times daily (usual maximum 500 micrograms/kg daily, particularly for children and youngadults).Premedication, slow intravenous injection adult, 10 mg as a single dose. Aid to gastrointestinal intubation, by mouth, by intramuscular injection, or by slow intravenous injection adult, 10–20 mg as a single dose 5–10 minutes before examination; young adult (15–19 years), 10 mg child under 3 years, 1 mg;child 3–5 years, 2 mg;child5–9 years, 2.5 mg;child9–14 years,5 mg.

**Metoclopramide 10 mg/2ml CMS net price Ampoule= 0. 671 SDG**

### 9.2.2.Promethazine

**Indication:** Anagement of postoperative and drug-induced nausea and vomiting labyrinthine disorders, motion sickness; premedication.

**Contraindications:** Porphyria;child under 2 years (risk of respiratory depression).

**Side-effects:** Drowsiness, dizziness, sedation (paradoxical stimulation may occur, especially with high doses or in children and the elderly ); headache, nightmares, confusion, psychomotor impairment; urinary retention, dry mouth, blurred vision,

gastrointestinal disturbances; extrapyramidal effects; hypersensitivity reactions; rash, photosensitivity reactions; jaundice; blood disorders; cardiovascular adverse effects (after injection); venous thrombosis at site of intravenous injection; pain on intramuscular injection.

**Dose:** Nausea and vomiting, by mouth,adult, 25 mg at night, increased to 50–75 mg at night or 25 mg 2–3 times daily if necessary (maximum, 100 mg in 24 hours). Nausea and vomiting, by deep intramuscular injection or by slow intravenous injection (diluted to 2.5 mg/ml in water for injection) adult, 12.5–25 mg, repeated at intervals of not less than 4 hours (usual maximum, 100 mg in 24 hours). Prevention of motion sickness, by mouth,adult, 20–25 mg at bedtime on night before travel, repeated on the morning of travel if necessary;child2–5 years, 5 mg at bedtime on night before travel and also on morning of travel if necessary;child5–10 years, 10 mg at bedtime on night before travel and also on morning of travel if necessary.

**Promethazine Hydrochloride 25 mg tablet CMS net price = 0.060 SDG, 25mg/ml 2ml Ampoule =0.250 SDG.**

**10-Endocrine system**

**10.1. Drugs used in diabetes**

**10.2.Thyroid and antithyroid drugs**

**10.3.Drugs affecting bone metabolism**

**10.4.Corticosteroids**

**10.1. Drugs used in diabetes**

### 10.1.1.Insulin injection(soluble)

**Indication:** Diabetes mellitus; diabetic emergencies and during surgery; diabetic ketoacidosis or coma.

**Side effects:** Transient oedema; hypoglycaemia in overdose; rarely hypersensitivity reactions including urticaria and rash; local reactions and lipoatrophy at injection site.

**Dose:** Diabetes mellitus, by subcutaneous injection, by intramuscular injection, by intravenous injection or by intravenous infusion,adultandchild, according to individual

requirements (see also introductory notes above).

**Insulin (soluble) 100 IU /ml CMS net price in 10 ml vail = 15.00 SDG, Insulin Zinc 100 IU/ml in 10 ml vail = 24.00 SDG, Insulin Mixed = 24.00 SDG.**

### 10.1.2 Metformin:

**Indications:** Diabetes mellitus polycystic ovary syndrome

**Contraindications:** Renal impairment ,ketoacidosis; risk of tissue hypoxia, caused by, for example, sepsis, respiratory failure, recent myocardial infarction, or hepatic impairment (withdraw treatment);use of iodine-containing X-ray contrast media (do not restart metformin until renal function returns to normal); use of general anaesthesia (suspend metformin on the morning of surgery and restart when renal function returns to normal); alcohol dependence; pregnancy.

**cautions:** Monitor renal function before treatment and once or twice annually (more frequently in theelderly or if deterioration suspected); substitute insulin during severe infection, trauma, surgery and pregnancy breastfeeding.

**Side effects:** Anorexia, nausea and vomiting, diarrhoea (usually transient), abdominal pain, metallic taste; rarely lactic acidosis (most likely in patients with renal impairment;

discontinue); decreased vitamin B12 absorption, erythema, pruritus and urticaria; hepatitis also reported.

**Dose:** Diabetes mellitus, by mouth,adultandchildover 10 years, initially 500 mg with breakfast for at least 1 week then 500 mg with breakfast and evening meal for at least 1 week, then 500 mg with breakfast, lunch, and evening meal or 850 mg every 12 hours with or after food; usual maximum, 2 g daily in divided doses.

**Metformin 500 mg tablet CMS net price = 0.120 SDG, 850 mg tablet = 0.150 SDG**

### 10.1.3.Glibenclamide:

**Indications:** Diabetes mellitus.

**Contraindications:** Ketoacidosis; porphyria; breastfeeding.

**Side effects:** Gastrointestinal disturbances and headache liver disorders; hypersensitivity reactions (usually only in first 6–8 weeks); rarely erythema multiforme, exfoliative dermatitis, fever, and jaundice; hypoglycaemia, particularly in the elderly ; rarely blood disorders including leukopenia, thrombocytopenia,agranulocytosis, pancytopenia, haemolytic anaemia, and aplastic anaemia.

**Dose:** Diabetes mellitus, by mouth,adult, initially 5 mg once daily with or immediately after breakfast (2.5 mg in the elderly ), adjusted according to response (maximum, 15 mg daily).

**Glibenclamide CMS net price 5 mg tablet = 0,040 SDG**



## 10.2.Thyroid and antithyroid drugs

### 10.2.1.Levothyroxine

**Indication:** Hypothyroidism.

**Contraindications:** thyrotoxicosis.

**Side effects:** With excessive dose anginal pain, arrhythmias, palpitations, tachycardia, skeletal muscle cramps, diarrhoea, vomiting, tremors, restlessness, excitability, insomnia, headache, flushing, sweating, excessive loss of weight and muscular weakness.

**Dose:** Hypothyroidism, by mouth adult, initially 50–100 micrograms daily (25–50 micrograms for those over 50 years) before breakfast, increased by 25–50 micrograms every 3–4 weeks until normal metabolism maintained; usual maintenance dose, 100–200 micrograms daily; (in cardiac disease, initially 25 micrograms daily or 50 micrograms on alternate days, adjusted in steps of 25 micrograms every 4 weeks). Congenital hypothyroidism and juvenile myxoedema by mouth, neonate up to 1 month, initially 5– 10 micrograms/kg daily, (5 micrograms/kg daily in infants andchildren over 1 month), adjusted in steps of 25 micrograms every 2–4 weeks, until mild toxic symptoms appear, then reduce dose slightly.

**Levothyroxine 50 mcg tablet CMS net price = 0.035 SDG, 100 mcg tablet = 0,040 SDG**

### 10.2.2.Carbimazole

**Indications:** Hyperthyroidism

**Side-effect:** Nausea, mild gastro-intestinal disturbances, taste disturbance, headache, fever, malaise, rash, pruritus, arthralgia; rarely myopathy, alopecia, bone marrow suppression (including pancytopenia and agranulocytosis.

**Dose:** Is given in a dose of 15 to 40 mg daily; higher doses should be prescribed under specialist supervision only. 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. Therapy is usually given for 12 to 18 months.children may be given carbimazole in an initial dose of 250 micrograms/kg three times daily, adjusted according to response; treatment inchildren should be undertaken by a specialist.

**Carbimazole 5 mg tablet CMS net price = 0.290 SDG**

### 10.2.3.Propylthiouracil

**Indication:** Hyperthyroidism.

**Side effects:** Nausea, rash, pruritus, arthralgia, headache; rarely alopecia, cutaneous vasculitis, thrombocytopenia, aplastic anaemia, lupus erythematosus-like syndrome, jaundice, hepatitis, hepatic necrosis, encephalopathy, and nephritis.

**Dose:** Hyperthyroidism, by mouth,adult, 300–600 mg daily until patient becomes euthyroid; dose may then be gradually reduced to a maintenance dose of 50–150 mg daily.

**Propylthiouracil CMS net price= New item**

### 10.2.4.Anterior pituitary hormones

#### 10.2.4.1.Human Chorionic Gonadotrophin; HCG:

**Indications:** Treatment of infertility in women with proven hypopituitarism or who have not responded to clomifene, or in super ovulation treatment for assisted conception (such as in vitro fertilisation). also occasionally used in the treatment of hypogonadotrophic hypogonadism and associated oligospermia.

**Contra-indications:** Androgen-dependent tumours

**Side-effects:** Oedema (particularly in males—reduce dose), headache, tiredness, mood changes, gynaecomastia, local reactions; may aggravate ovarian hyperstimulation, multiple pregnancy.

**Dose:** By subcutaneous or intramuscular injection, according to patient's response.

**Human Chorionic Gonadotrophin(HCG) CMS net price= New item**

### 10.2.4.2.Somatropin

**(Recombinant Human Growth Hormone)**

**Indications:** See under Dose

**Contra-indication:** Evidence of tumour activity (complete antitumour therapy and ensure intracranial lesions inactive before starting); not to be used after renal transplantation or for growth promotion inchildren with closed epiphyses (or near closure in Prader-Willi syndrome); severe obesity or severe respiratory impairment in Prader-Willi syndrome.

**Side-effects:** Headache, funduscopy for papilloedema recommended if severe or recurrent headache, visual problems, nausea and vomiting occur—if papilloedema confirmed consider benign intracranial hypertension (rare cases reported); fluid retention (peripheral oedema), arthralgia, myalgia, carpal tunnel syndrome, paraesthesia, antibody formation, hypothyroidism, insulin resistance, hyperglycaemia, hypoglycaemia, reactions at injection site; leukaemia inchildren with growth hormone deficiency also reported.

**Dose:** Gonadal dysgenesis (Turner syndrome), by subcutaneous injection, 45–50 micrograms/kg daily or 1.4 mg/m2 daily deficiency of growth hormone inchildren, by subcutaneous or intramuscular injection, 23–39 micrograms/kg daily or 0.7–1 mg/m2 daily . Growth disturbance in shortchildren born small for gestational age whose growth has not caught up by 4 years or later, by subcutaneous injection, 35 micrograms/kg daily or 1 mg/m2 daily. Prader-Willi syndrome, by subcutaneous injection inchildren with growth velocity greater than 1 cm/year, in combination with energy-restricted diet, 35 micrograms/kg daily or 1 mg/m2 daily; max. 2.7 mg daily Chronic renal insufficiency inchildren (renal function decreased to less than 50%), by subcutaneous injection, 45–50 micrograms/kg daily or 1.4 mg/m2 daily (higher doses may be needed) adjusted if necessary after 6 monthsadultgrowth hormone deficiency, by subcutaneous injection, initially 150–300 micrograms daily, gradually increased if required to max. 1 mg daily; use minimum effective dose (requirements may decrease with age) SHOX deficiency inchildren, by subcutaneous injection, 45–50 micrograms/kg daily.

**Somatropin 15IU/1.5 ml CMS net price Vail = 305.370 SDG**

### 10.2.4.3.Desmopressin

**Indications:** Diabetes insipidus.

**Contra-indications:** Cardiac insufficiency and other conditions treated with diuretics; psychogenic polydipsia and polydipsia in alcohol dependence fluid retention, and hyponatraemia (in more serious cases with convulsions) on administration without restricting fluid intake; stomach pain, headache, nausea, vomiting, allergic reactions, and emotional disturbance inchildren also reported; epistaxis, nasal congestion, rhinitis with nasal spray.

**Dose:** By mouth (as desmopressin acetate) adult and child initially 300 micrograms daily (in 3 divided doses); maintenance, 300–600 micrograms daily in 3 divided doses; range 0.2–1.2 mg daily Primary nocturnal enuresis, adult (under 65 years) and child over 5 years 200 micrograms at bedtime, only increased to 400 micrograms if lower dose not effective ;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 micrograms daily in 3 divided doses; range 120–720 micrograms daily. Primary nocturnal enuresis, adult (under 65 years) andchildover 5 years 120 micrograms at bedtime, only increased to 240 micrograms if lower dose not effective ;withdraw for at least 1 week for reassessment after 3 months . Polyuria or polydipsia after hypophysectomy, adjust dose according to urine osmolality. Intranasally (as desmopressin acetate). Diabetes insipidus, diagnosis,adult and child20 micrograms (limit fluid intake to 500 mL from 1 hour before to 8 hours after administration). Diabetes insipidus, treatment,adult10–40 micrograms daily (in 1–2 divided doses);child5–20 micrograms daily; infants may require lower doses.Nocturia associated with multiple sclerosis (when other treatments have failed) adult (under 65 years) 10–20 micrograms at bedtime) dose not to be repeated within 24 hours.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) adult40 micrograms; INFANT under 1 year 10 micrograms (restrict fluid intake to 50% at next 2 feeds to avoid fluid overload),child1–15 years 20 micrograms .Mild to moderate haemophilia and von Willebrand's disease, adult 300 micrograms (one 150-microgram 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,adult300 micrograms (one 150-microgram 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 micrograms (limit fluid intake to 500 mL from 1 hour before to 8 hours after administration). Diabetes insipidus, treatment (subcutaneous, intramuscular or intravenous),adult1–4 micrograms daily; infant and child 400 nanograms. 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) (subcutaneous or intramuscular),adult and child 2 micrograms; infant 400 nanograms (restrict fluid intake to 50% at next 2 feeds).Mild to moderate haemophilia and von Willebrand's disease, (subcutaneous or intravenous),adultandchildover 1 month 300 nanograms/kg as a single dose immediately before surgery or after trauma; may be repeated at intervals of 12 hoursFibrinolytic response testing, (subcutaneous or intravenous),adultandchild300 nanograms/kg; blood sampled after 20 minutes for fibrinolytic activity.Lumbar-puncture-associated headache, consult product literature.

**Desmopressin 100 mcg/ml CMS net price 5 ml nasal spray = 45.560 SDG, 0.1 mg tablet = 8.500SDG**

## 10.3.Drugs affecting bone metabolism

### 10.3.1.Zoledroic Acid

**Indication:** Prophylaxis and treatment of osteoporosis and corticosteroid-induced osteoporosis.

**Contra-indications:** Women ofchild-bearing potential

**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, dyspnoea, 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.

**Zoledroic Acid CMS net price = 1410.71SDG**



## 10.4.Corticosteroids

**Side-effects of corticosteroids**: Overdosage or prolonged use can exaggerate some of the normal physiological actions of corticosteroids leading to mineralocorticoid and glucocorticoid side-effects. Mineralocorticoid side-effects include hypertension, sodium and water retention, and potassium and calcium loss. They are most marked with fludrocortisone, but are significant with cortisone, hydrocortisone, corticotropin, and tetracosactide (tetracosactrin). Mineralocorticoid actions are negligible with the high potency glucocorticoids, betamethasone and dexamethasone, and occur only slightly with methylprednisolone, prednisolone, and triamcinolone. Glucocorticoid side-effects include diabetes and osteoporosis ;which is a danger, particularly in the elderly , as it can result in osteoporotic fractures for example of the hip or vertebrae; in addition high doses are associated with avascular necrosis of the femoral head. Muscle wasting (proximal myopathy) can also occur. Corticosteroid therapy is also weakly linked with peptic ulceration and perforation; there is no conclusive evidence that the use of enteric-coated preparations of prednisolone reduces the risk of peptic ulceration.High doses of corticosteroids can cause Cushing's syndrome, with moon face, striae, and acne; it is usually reversible on withdrawal of treatment, but this must always be gradually tapered to avoid symptoms of acute adrenal insufficiency .Inchildren, administration of corticosteroids may result in suppression of growth. For the effect of corticosteroids given in pregnancy.Side-effects can be minimised by using lowest effective dose for minimum period possible. Other side-effects include: gastro-intestinal effects: dyspepsia, abdominal distension, acute pancreatitis,

oesophageal ulceration and candidiasis; musculoskeletal effects: muscle weakness, vertebral and long bone fractures, tendon rupture; endocrine effects: menstrual irregularities and amenorrhoea, hirsutism, weight gain, hypercholesterolaemia, hyperlipidaemia, negative nitrogen and calcium balance, increased appetite; increased susceptibility to and severity of infection, reactivation of dormant tuberculosis; neuropsychiatric effects: psychological dependence, insomnia, increased intracranial pressure with papilloedema inchildren (usually after withdrawal), aggravation of schizophrenia, aggravation of epilepsy; ophthalmic effects: glaucoma, papilloedema, posterior subcapsular cataracts, corneal or scleral thinning and exacerbation of ophthalmic viral or fungal disease, increased intra-ocular pressure, exophthalmos; also impaired healing, petechiae, ecchymoses, facial erythema, suppression of skin test reactions, urticaria, hyperhidrosis, skin atrophy, bruising, telangiectasia, myocardial rupture following recent myocardial infarction, congestive heart failure, leucocytosis, hyperglycaemia, thromboembolism, nausea, malaise, hiccups, headache, vertigo.

### 10.4.1.Betamethasone:

**Indications:** Suppression of inflammatory and allergic disorders; congenital adrenal hyperplasia; ear; eye; nose; oral ulceration.

**Dose:** By mouth, usual range 0.5–5 mg daily; see also Administration (above) By intramuscular injection or slow intravenous injection or infusion, 4–20 mg, repeated up to 4 times in 24 hours;child, by slow intravenous injection, up to 1 year 1 mg, 1–5 years 2 mg, 6–12 years 4 mg, repeated up to 4 times in 24 hours according to response.

**Betamethasone 0.1% (as valerate) CMS net price 15gm/tube (cream) = 2.820 SDG**

### 10.4.2.Dexamethasone

**Indications:** Suppression of inflammatory and allergic disorders; diagnosis of Cushing's disease, congenital adrenal hyperplasia; cerebral oedema associated with malignancy; croup nausea and vomiting with chemotherapy rheumatic disease ;eye.

**Dose:** By mouth, usual range 0.5–10 mg daily;child10–100 micrograms/kg daily. By intramuscular injection or slow intravenous injection or infusion, see under preparations.

**Dexamethasone Sodium phosphate 4mg/ml CMS net price Ampoule = 0.290 SDG**

### 10.4.3.Methylprednisolone

**Indications:** Suppression of inflammatory and allergic disorders; severe inflammatory bowel disease ;cerebral oedema associated with malignancy; see also notes above; rheumatic disease skin.

**Dose:** By mouth, usual range 2–40 mg daily.By intramuscular injection or slow intravenous injection or infusion, initially 10–500 mg; graft rejection, up to 1 g daily by intravenous infusion for up to 3 days.

**Methylprednisolone Sodium Succsinate 1g CMS net price Vail = 27.530 SDG**

## 11-Antidotes and other substances used in poisonings

### 11.1.Non-specific

### 11.2. Specific

### 11.1.Non-specific

#### 11.1.1.Charcoal, Activated

**Indication:** Treatment of acute poisoning.

**Contraindications:** Poisoning by hydrocarbons with high potential for harm if aspirated; poisoning by corrosive substances (may prevent visualization of lesions caused by the poison).

**Side-effects:** Black stools; vomiting, constipation or diarrhoea; pneumonitis (due to aspiration).

**Dose:** Poisoning (reduction of absorption), by mouth, as soon as possible after ingestion of poison,adult, 50–100 g as a single dose; Infant, 1 g/kg as a single dose;child1–12 years, 25 g as a single dose (50 g in severe poisoning). Poisoning (active elimination), by mouth,adult, 50 g every 4 hours (in case of intolerance 25 g every 2 hours); Infant, 1 g/kg every 4–6 hours;childover 1 year, 25–50 g every 4–6 hours.

**Charcoal, activated CMS net price = New item**



### 11.2. Specific

#### 11.2.1.Acetylcysteine

**Indication:** Paracetamol overdosage.

**Side-effects:** Hypersensitivity-like reactions may be managed by reducing infusion rate or suspending infusion until reaction has settled (specialist advice may be needed); rash may be managed with an antihistamine, for example chlorphenamine, and acute asthma with a short-acting beta2- agonist, such as salbutamol.

**Dose:** Paracetamol overdosage, by intravenous infusion, adult and child, initially 150 mg/kg over 15 minutes, then 50 mg/kg over 4 hours, then 100 mg/kg over 16 hours.

Adminstration dilute requisite dose in glucose intravenous infusion solution, 5% as follows:adultandchildover 12 years, initially 200 ml given over 15 minutes, then 500 ml over 4 hours, then 1 litre over 16 hours:childunder 12 years with a body weight over 20 kg, initially 100 ml given over 15 minutes, then 250 ml over 4 hours, then 500 ml over 16 hours;childunder 12 years with a body weight under 20 kg, initially 3 ml/kg given over 15 minutes, then 7 ml/kg over 4 hours, then 14 ml/kg over 16 hours.

**Acetylcysteine 200mg/ml for inj. CMS net price 10ml = 183.22 SDG**

### 11.2.2.Naloxone

**Indication:** Opioid overdosage; postoperative respiratory depression.

**Side effects: -** Nausea, vomiting, and sweating (may also be due to opioid withdrawal).

**Dose:** Overdosage of opioids, by intravenous injection,adult, 0.4–2 mg repeated at intervals of 2–3 minutes up to a maximum of 10 mg; question diagnosis if respiratory function does not improve;child, 10 micrograms/kg; a subsequent dose of 100 micrograms/kg may be given if no response.

**Naloxone HCl 0.4mg/ml CMS net price Vial = 1.120 SDG**

### 11.2.3.Flumazenil

**Indications:** Reversal of sedative effects of benzodiazepines in anaesthetic, intensive care, and clinical procedures; overdosage with benzodiazepines.

**Contra-indications:** Life-threatening condition (e.g. raised intracranial pressure, status epilepticus) controlled by benzodiazepines.

**Side-effects:** Nausea and vomiting; less commonly palpitation, anxiety, fear; also reported transient hypertension, tachycardia, flushing, agitation, convulsions (particularly in those with epilepsy), dizziness, sensory disturbance, chills, sweating.

**Dose:** Anaesthesia and clinical procedures, by intravenous injection, 200 micrograms over 15 seconds, then 100 micrograms at 60-second intervals if required; usual dose range, 300–600 micrograms; max. total dose 1 mg;child1 month–18 years. Intensive care, by intravenous injection, 300 micrograms over 15 seconds, then 100 micrograms at 60-second intervals if required; max. total dose 2 mg; then if drowsiness recurs either, by intravenous injection, 300 micrograms, or by intravenous infusion, 100–400 micrograms/hour, adjusted according to response;child1 month–18 years.

**Flumazenil 0.1mg/ml CMS net price 5ml Ampoule = 207.600 SDG**

### 11.2.4.Mesna

**Indications:** Haemorrhagic cystitis is a common manifestation of urothelial toxicity which occurs with the oxazaphosphorines, cyclophosphamide and ifosfamide; it is caused by the metabolite acrolein. Mesna reacts specifically with this metabolite in the urinary tract, preventing toxicity. Mesna is used routinely (preferably by mouth) in patients receiving ifosfamide, and in patients receiving cyclophosphamide by the

intravenous route at a high dose (e.g. more than 2 g) or in those who experienced urothelial toxicity when given cyclophosphamide previously.

**Contra-indications:** Hypersensitivity to thiol-containing compounds

**Side-effect:** Nausea, vomiting, colic, diarrhoea, fatigue, headache, limb and joint pains, depression, irritability, rash, hypotension and tachycardia; rarely hypersensitivity reactions (common in patients with auto-immune disorders)

**Dose:** Calculated according oxazaphosphorine (cyclophosphamide or ifosfamide) treatment consult product literature.

**Mesna (Sodium Mercaptoethane Sulfonate) 400mg/4ml for inj. CMS net price vail =7.920 SDG**

### 11.2.5.Pralidoxime chloride

**Indications:** Adjunct to atropine in the treatment of poisoning by organophosphorus insecticide or nerve agent

**Cautions:** Myasthenia gravis.

**Contra-indications:** Poisoning with carbamates or with organophosphorus compounds without anticholinesterase activity.

**Side-effects:** Drowsiness, dizziness, disturbances of vision, nausea, tachycardia, headache, hyperventilation, and muscular weakness.

**Dose:** Intravenous infusion,adultandchildinitially 30 mg/kg over 20 minutes, followed by 8 mg/kg/hour; usual max. 12 g in 24 hours.

**Pralidoxime Chloride CMS net price = New item**

### 11.2.6. Desferrioxamine

**Indications:** acute iron poisoning; chronic iron overload; aluminium overload

**Side-effects:** hypotension (especially when given too rapidly by intravenous injection), disturbances of hearing and vision (including lens opacity and retinopathy); injection-site reactions, gastrointestinal 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 continuous intravenous infusion,adultandchildup to 15 mg/kg/hour, reduced after 4–6 hours; max. 80 mg/kg in 24 hours.

Desferrioxamine CMS net price = 19.50239 SDG

### 11.2.7.Digibind

**Indications:** Digoxin-specific antibody fragments are indicated for the treatment of known or strongly suspected digoxin or other cardiac glycoside overdosage when measures beyond the withdrawal of the cardiac glycoside and correction of any electrolyte abnormalities are felt to be necessary.

Digibind CMS net price = New item

### 11.2.8.Folinic acid

**Indications:** (Given as calcium folinate) used to counteract the folate-antagonist action of methotrexate and thus speed recovery from methotrexate-induced mucositis or myelosuppression (‘folinic acid rescue’).

Calcium Folinate 50 mg for inj (Leucovorin Calcium) CMS net price vail = 11.00 SDG.

## 12. Oxytocics

### 12.1.Ergometrine Maleate for I.M inj. 0.5mg/ml, 1ml amp.

**Indication:** prevention and treatment of postpartum and post-abortion haemorrhage in emergency situations and where oxytocin not available.

**Contraindications:** induction of labour; first and second stages of labour; vascular disease, severe cardiac disease especially angina pectoris; severe hypertension; severe renal and hepatic impairment; sepsis; eclampsia.

**cautions:** cardiac disease, hypertension, hepatic impairment renal impairment multiple pregnancy, porphyria;

**side effects:** nausea, vomiting, headache, dizziness, tinnitus, abdominal pain, chest pain, palpitations, dyspnoea, bradycardia, transient hypertension, vasoconstriction; stroke, myocardial infarction and pulmonary oedema also reported.

**Dose:** Prevention and treatment of postpartum haemorrhage, by intramuscular injection,adult, 200 micrograms when the anterior shoulder is delivered or immediately after birth. Excessive uterine bleeding, by slow intravenous injection, adult, 250–500 micrograms when the anterior shoulder is delivered or immediately after birth.

**Ergometrine Maleate 0.5mg /1ml CMS net price Ampoule = 1.021 SDG**

### 12.2.Misoprostol 200mcg scored vaginal tablet

**Indications:** induction of labour; medical termination of intrauterine pregnancy of up to 63 days gestation with mifepristone.

**Contraindications:** induction of labour. 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.

**cautions:** induction of labour conditions where hypotension might precipitate severe complications (for example, cerebrovascular disease or cardiovascular disease). History of caesarean section or major uterine surgery, grand multiparas (risk of rupture).

**Side effects:** uterine hyperstimulation, uterine rupture, fetal distress; less commonly in obstetric setting diarrhoea, abdominal pain, dyspepsia, flatulence, nausea and vomiting, rash, dizziness.

**Dose:** Induction of labour, by vagina,adult , initially 25 micrograms, repeated after 6 hours if necessary; if still no response, increase to 50 micrograms every 6 hours for up to 4 doses.

**NOTE.** Should it be necessary to continue induction of labour with oxytocin, administration of oxytocin should be avoided within 8 hours of using misoprostol. Medical termination of intrauterine pregnancy of up to 63 days gestation, by vagina,adult misoprostol, 800 micrograms 36–48 hours after mifepristone, 200 mg as a single dose by mouth (unless abortion already complete) and individual observed for at least 6 hours (or until bleeding or pain at acceptable level) with follow-up visit 10–15 days later to verify complete expulsion (if treatment fails essential that pregnancy terminated by another method).

Administration: For medical termination of pregnancy, oral tablets may be administered vaginally if a suitable vaginal preparation is not available; for induction of labour, low-dose vaginal tablets should be used, but if these are not available, 100-microgram oral tablets [not included on the 15th WHO Model List] can be divided to the required dose and administered vaginally.



**Misoprostol 200mcg scored vaginal tablet CMS net price = New item**

### 12.3.Oxytocin

**Indications:** Routine prevention and treatment of postpartum and post-abortion haemorrhage; induction of labour.

**Contraindications:** hypertonic uterine contractions, mechanical obstruction to delivery, fetal distress; any condition where spontaneous labour or vaginal delivery inadvisable; avoid prolonged administration in oxytocin resistant uterine inertia, in severe pre-eclamptic toxaemia, or in severe cardiovascular disease; major cephalopelvic disproportion.

**cautions:** Induction or enhancement of labour in presence of borderline cephalopelvic disproportion (avoid if significant); mild to moderate pregnancy-associated hypertension or cardiac disease; age over 35 years; history of low-uterine segment caesarean section; avoid tumultuous labour if fetal death or meconium-stained amniotic fluid (risk of amniotic fluid embolism) occurs; water intoxication and hyponatraemia (avoid large volume infusions and restrict fluid

intake); caudal block anaesthesia (risk of severe hypertension due to enhanced vasopressor effect of sympathomimetics).

**Side effects:** Uterine spasm, and 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 (with high doses and large-volume infusions); nausea, vomiting, arrhythmias, rash and anaphylactoid reactions also reported.

**Dose:**Induction of labour, by intravenous infusion adult, initially 0.001–0.002 IU/minute increased in 0.001–0.002 IU/minute increments at intervals of 30 minutes until up to 3–4 contractions occur every 10 minutes; maximum rate, 0.02 IU/minute.

NOTE. The dose shown above is suitable for use in hospital where equipment to control the infusion rate is available; alternative recommendations may be suitable for other settings.

**Oxytocin 10 IU/ml CMS net price (16.66mcg/ml) Ampoule = 0.300 SDG**

### 12.4.Prostaglandin analogues

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 veryelderly from whom NSAIDs cannot be withdrawn.

## 13.Immunologicals

## 13.1. immunoglobulins

## 13.2. Vaccines

## 13.1. immunoglobulins

### 13.1.1. Anti-D immunoglobulin (human)

**Indications:** Prevention of formation of antibodies to rhesus-positive blood cells in rhesus-negative patients.

**Contraindications:** Known hypersensitivity to anti-D immunoglobulin.

**cautions:** Rhesus-positive patients receiving treatment for blood disorders; rhesus-negative patients with anti-D antibodies in their serum. Rubella vaccine may be administered in the postpartum period at the same time as anti-D immunoglobulin, but only if separate syringes and contralateral sites are used. If blood is transfused, the antibody response to the vaccine may be inhibited (measure rubella antibodies after 8 weeks and revaccinate if necessary).

**Side-effects:** nausea, vomiting, diarrhoea, abdominal pain; hypotension, hypertension, headache, fever, malaise, asthenia, drowsiness, dizziness, back pain, arthralgia, myalgia; pruritus, rash, sweating, injection site pain; anaphylaxis, dyspnoea, hypotension, and urticaria; (for side-effects associated with intravenous immunoglobulins.

**Dose:**Following birth of a rhesus-positive infant to a rhesus-negative mother, by intramuscular injection, adult, 250 micrograms immediately or within 72 hours of birth (see also introductory note above). Following any potentially sensitizing episode (for example, amniocentesis, stillbirth), by intramuscular injection adult, up to 20 weeks' gestation, 250 micrograms per episode (after 20 weeks, 500 micrograms) immediately or within 72 hours (see also introductory note above). Following Rh0 (D) incompatible blood transfusion, by intramuscular injection, adult, 10–20 micrograms per ml transfused rhesus-positive blood.

**Human Anti-D Immunoglobulin 150 µg/ml for inj. CMS net price 2 ml amp= 173.420 SDG**

### 13.1.2.Anti tetanus immunoglobulin

**Indications:** Post-exposure prophylaxis and treatment of tetanus infection.

**Cautions:** IgA deficiency; interference with live virus vaccines.

**Side-effects:** injection site swelling and pain; rarely anaphylaxis.

**Dose:** Post-exposure prophylaxis, by intramuscular injection 250 units, increased to 500 units if more than 24 hours have elapsed or there is risk of heavy contamination or following burns.

**Anti Tetanus Immunoglobulin 250 IU powder for inj CMS net price Vial = 49.950 SDG**

### 13.1.3. Antivenom immunoglobulins

**Indications:** Treatment of snake bites and spider bites.

**cautions:** Resuscitation facilities should be immediately available.

**Side effects:** Serum sickness; anaphylaxis with hypotension, dyspnoea, urticaria, and shock.

**Dose:** Depends on the specific antivenom used; consult manufacturer's literature.

**lyophilized Anti Snake polyvalent Venom single dose CMS net price Vial = 30.576 SDG**

### 13.1.4. Diphtheria antitoxin



**Indications:** Passive immunization in suspected cases of diphtheria.

**Cautions:** Initial test dose to exclude hypersensitivity; observation required after full dose (epinephrine (adrenaline) and resuscitation facilities should be available).

**Side effects:** Anaphylaxis with urticaria, hypotension, dyspnoea, and shock; serum sickness up to 12 days after injection.

**Dose:** Passive immunization in suspected diphtheria (see Precautions), by intramuscular injection,adultandchild, 10 000–30 000 IU in mild to moderate cases; 40 000–100 000 IU in severe cases (doses of more than 40 000 IU should be given in divided doses, the first portion by intramuscular injection, followed by the bulk of the dose by intravenous injection after an interval of 0.5–2 hours).

**Diphtheria Antitoxin 10000 IU CMS net price Vial = 33.538 SDG**

### 13.1.5. Rabies immunoglobulin

**Indications:** Passive immunization either post-exposure or in suspected exposure to rabies in high-risk countries in unimmunized individuals (in conjunction with rabies vaccine).

**Contraindications:** See introductory notes; also avoid repeat doses after vaccine treatment initiated; intravenous administration.

**Cautions:** IgA deficiency; interference with live virus vaccines

**Side-effects:** injection site swelling and pain; very rarely anaphylaxis; buccal ulceration, glossitis, chest tightness, dyspnoea, tremor, dizziness, arthralgia, and facial oedema also reported

**Dose:** Passive immunization against rabies (post-exposure or following suspected exposure) by infiltration,adultandchild, 20 IU/kg in and around the cleansed wound; if wound is not visible or has healed, or if infiltration of whole volume is not possible, give remainder by intramuscular injection into the anterolateral thigh.

**Anti Rabies Sera Immunoglobin 150IU/ml CMS net price 2ml vail= 277.470 SDG**

### 13.1.6. Human normal Immunoglobulin

**Indications:** Normal immunoglobulin (containing 10%–18%) is administered by intramuscular injection for the protection of susceptible contacts against hepatitis A virus (infectious hepatitis), measles and, to a lesser extent, rubella. Injection of immunoglobulin produces immediate protection lasting several weeks. Normal immunoglobulin (containing 3%–12% protein) for intravenous administration is used as replacement therapy for patients with congenital agammaglobulinaemia and hypogammaglobulinaemia, and for the short-term treatment of idiopathic thrombocytopenic purpura and Kawasaki syndrome; it is also used for the prophylaxis of infection following bone-marrow transplantation and inchildren with symptomatic HIV infection who have recurrent bacterial infections. Normal immunoglobulin for replacement therapy may also be given intramuscularly or subcutaneously, but intravenous formulations are normally preferred. Intravenous immunoglobulin is also used in the treatment of Guillain-Barré syndrome as an alternative to plasma exchange.

**Cautions:** hypo- or agammaglobulinaemia with or without IgA deficiency; interference with live virus vaccines. Intravenous use thrombophilic disorders, or risk factors for arterial or venous thromboembolic events; obesity; ensure adequate hydration, renal insufficiency.

**Contra-indications:** Patients with selective IgA deficiency who have known antibody against IgA.

**Side-effects:** Nausea, diarrhoea, chills, fever, headache, dizziness, arthralgia, myalgia, muscle spasms, low back pain; rarely hypotension, anaphylaxis, cutaneous skin reactions, aseptic meningitis, acute renal failure; also reported with intravenous use,

injection site reactions, abdominal pain and distension, blood pressure fluctuations, haemolytic anaemia, thromboembolic events including myocardial infarction, stroke, pulmonary embolism, and deep vein thrombosis

**Dose:** Antibody titres can vary widely between normal immunoglobulin preparations from different manufacturers—formulations are not interchangeable; patients should be maintained on the same formulation throughout long-term treatment to avoid adverse effects

**Human Normal Immunoglobulin 5gm for IV inj.with 100 ml diluent CMS net price Vial = 1,456.000 SDG**

### 13.1.7. Hepatitis B specific immunoglobulin100U/ml 2ml

**Indications:** Prophylaxis against hepatitis B infection.

**Cautions:** IgA deficiency; interference with live virus vaccines which should therefore only be given at least 3 weeks before or 3 months after an injection of normal immunoglobulin.

**Side-effects:** Injection site reactions; less frequently, buccal ulceration, glossitis, abdominal pain, chest pain, dyspnoea, anaphylaxis, tremor, dizziness, headache, arthralgia; for side-effects associated with intravenous immunoglobulin .



**Dose:** Disease-specific hepatitis B immunoglobulin (‘HBIG’) is available for use in association with hepatitis B vaccine for the prevention of infection in laboratory and other personnel who have been accidentally inoculated 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. Hepatitis B immunoglobulin will not inhibit the antibody response when given at the same time as hepatitis B vaccine but should be given at different sites. An intravenous and subcutaneous preparation of hepatitis B-specific immunoglobulin is licensed for the prevention of hepatitis B recurrence in HBV-DNA negative patients who have undergone liver transplantation for liver failure caused by the virus. prevention of hepatitis B re-infection more than 6 months after liver transplantation in stable HBV-DNA negative patients starting 2–3 weeks after last dose of intravenous hepatitis B immunoglobulin, by subcutaneous injection,adultbody-weight under 75 kg 500 units once weekly, increased if necessary up to 1000 units once weekly; body-weight over 75 kg 1000 units once weekly by intravenous infusion, after exposure to hepatitis B virus-contaminated material—consult product literature Prevention of transmitted infection at birth—consult product literature Prevention of hepatitis B in haemodialysed patients, prophylaxis against re-infection of transplanted liver—consult product literature

**Hepatitis B specific Immunoglobulin100U/ml CMS net price 2ml = New item**

## 13.2. Vaccines

### 13.2.1. Rabies vaccine

**Indications:** Immunisation against rabies.

**Cautions:** Most individuals can safely receive the majority of vaccines. Vaccination may be postponed if the individual is suffering from an acute illness; however, it is not necessary to postpone immunisation in patients with minor illnesses without fever or systemic upset. See also Predisposition to Neurological Problems, below. For individuals with bleeding disorders, see Route of administration, below. If alcohol or disinfectant is used for cleansing the skin it should be allowed to evaporate before vaccination to prevent possible inactivation of live vaccines. When 2 or more vaccines are required they should be given simultaneously at different sites, preferably in a different limb; if more than one injection is to be given in the same limb, they should be administered at least 2.5 cm apart. When 2 live vaccines cannot be given at the same time, they should be separated by an interval of at least 4 weeks.

**Contra-indications:** Vaccines are contra-indicated in those who have a confirmed anaphylactic reaction to a preceding dose of a vaccine containing the same antigens or vaccine component (such as antibacterials in viral vaccines). The presence of the following excipients in vaccines and immunological products has been noted under the relevant entries:

| | |
|---|---|
| Gelatin | Penicillins |
| Gentamicin | Polymyxin B |
| Kanamycin | Streptomycin |
| Neomycin | Thiomersal |

Hypersensitivity to egg with evidence of previous anaphylactic reaction, contra-indicates influenza vaccine (prepared in hens' eggs), tick-borne encephalitis vaccine, and yellow fever vaccine. Live vaccines may be contra-indicated temporarily in individuals who are: Immunosuppressed , pregnant

**Dose:** Pre-exposure prophylaxis, by intramuscular injection in deltoid region or anterolateral thigh in infants, 1 mL on days 0, 7, and 21 or 28; for those at continued risk give a single reinforcingdose 1 year after the primary course is completed and booster doses every 3–5 years; for those at intermittent risk give booster doses every 2–5 years Post-exposure prophylaxis, by intramuscular injection in deltoid region or anterolateral thigh in infants, 1 mL

**Rabies vaccine Solution or freeze dried powder single dose CMS net price vial (Human dipoid) = 36.700 SDG**

### 13.2.2. Influenza vaccine

**Indications:** Annual immunisation against seasonal influenza; immunisation against influenza during a pandemic.

**Cautions:** Most individuals can safely receive the majority of vaccines. Vaccination may be postponed if the individual is suffering from an acute illness; however, it is not necessary to postpone immunisation in patients with minor illnesses without fever or systemic upset. For individuals with bleeding disorders, see Route of administration, below. If alcohol or disinfectant is used for cleansing the skin it should be allowed to evaporate before vaccination to prevent possible inactivation of live vaccines. When 2 or more vaccines are required they should be given simultaneously at different sites, preferably in a different limb; if more than one injection is to be given in the same limb, they should be administered at least 2.5 cm apart See also Cautions under individual vaccines .

**Contra-indications:** Vaccines are contra-indicated in those who have a confirmed anaphylactic reaction to a preceding dose of a vaccine containing the same antigens or vaccine component (such as antibacterials in viral vaccines). The presence of the following excipients in vaccines and immunological products has been noted under the relevant entries:



| | |
|---|---|
| Gelatin | Penicillins |
| Gentamicin | Polymyxin B |
| Kanamycin | Streptomycin |
| Neomycin | Thiomersal |

Hypersensitivity to egg with evidence previous anaphylactic reaction, contra-indicates influenza vaccine tick-borne encephalitis vaccine, and yellow fever vaccine. Live vaccines may be contra-indicated temporarily in individuals who are: immunosuppressed,pregnant

**Side-effects:** Injection of a vaccine may be followed by local reactions such as pain, inflammation, redness, and lymphangitis. An induration or sterile abscess may develop at the injection site. Gastro-intestinal disturbances, fever, headache, irritability, loss of appetite, fatigue, myalgia, and malaise are among the most commonly reported side-effects. Other side-effects include influenza-like symptoms, dizziness, paraesthesia, asthenia, drowsiness, arthralgia, rash, and lymphadenopathy. Hypersensitivity reactions, such as bronchospasm, angioedema, urticaria, and anaphylaxis, are very rare but can be fatal

**Dose:** By intramuscular injection,adultandchildover 13 years, 0.5 mL as a single dose;child6 months–3 years, 0.25–0.5 mL; 3–13 years 0.5 mL; forchildren 6

months to 13 years who have not received seasonal influenzavaccine previously, repeat after 4–6 weeks

**Influenza vaccine suspension of inactivated Influanza virus 0.5 ml prefilled Syringe CMS net price = 24.00 SDG**

### 13.2.3. Hepatitis B vaccine

**Indications:** Active immunization against hepatitis B.

**cautions:** Diabetes mellitus; chronic renal failure.

**Dose:** Primary immunization ofchildren against hepatitis B (3-dose schedule), by intramuscular injection,child, 1 dose of 0.5 ml given between 6 weeks and 15 years of age, followed by 2 doses, each of 0.5 ml given at intervals of 4 weeks; alternatively, 1 dose of 0.5 ml at birth, followed by 2 doses, each of 0.5 ml, given at 6 and 14 weeks of age. Primary immunization ofchildren against hepatitis B (4-dose schedule), by intramuscular injection,child, 1 dose of 0.5 ml at birth, followed by 3 doses, each of 0.5 ml, at 6, 10, and 14 weeks of age.

**Hepatitis B vaccine 20µg/ml for I.M inj. CMS net price 5ml vial = 43.500 SDG**

### 13.2.4. Meningococcal polysaccharide A and C, or A, C, W135, and Y vaccines

**Indications:** Active immunization against meningitis and septicaemia caused by N. meningitidis serogroups A and C, or serogroups A, C, W135 and Y.

**Cautions:** Most individuals can safely receive the majority of vaccines. Vaccination may be postponed if the individual is suffering from an acute illness; however, it is not necessary to postpone immunisation in patients with minor illnesses without fever or systemic upset. For individuals with bleeding disorders, see Route of administration, below. If alcohol or disinfectant is used for cleansing the skin it should be allowed to evaporate before vaccination to prevent possible inactivation of live vaccines. When 2 or more vaccines are required (and are not available as a combined preparation), they should be given simultaneously at different sites, preferably in a different limb; if more than one injection is to be given in the same limb, they should be administered at least 2.5 cm apart . When 2 live vaccines cannot be given at the same time, they should be separated by an interval of at least 4 weeks.

**Contra-indications:** Vaccines are contra-indicated in those who have a confirmed anaphylactic reaction to a preceding dose of a vaccine containing the same antigens or vaccine component (such as antibacterials in viral vaccines). The presence of the following excipients in vaccines and immunological products has been noted under the relevant entries:

| | |
|---|---|
| Gelatin | Penicillins |
| Gentamicin | Polymyxin B |
| Kanamycin | Streptomycin |
| Neomyc | Thiomersal |

**Side-effects:** Rarely symptoms of meningitis reported (but no evidence that the vaccine causes meningococcal Cmeningitis). Powder for injection, inactivated polysaccharide antigens of neisseria.

**Dose:** Immunization against infection by N. meningitidis (serogroups A and C, or A, C, W135, and Y), by subcutaneous injection,adultandchild, 0.5 ml as a single dose.

**Meningitidis serogroups A and C CMS net price = 91.610 SDG, or Serogroups A, C, W135, and Y=278.220 SDG**

### 13.2.4. Yellow fever vaccine

**Indications:** - Active immunization against yellow fever.



**Contraindications:** Not recommended for infants under 9 months of age.

**Dose:** Immunization ofchildren against yellow fever, by deep subcutaneous or intramuscular injection,infant at 9–12 months, 0.5 ml as a single dose. Immunization of travellers and other at-risk individuals against yellow fever, by deep subcutaneous or intramuscular injection,adultandchildover 9 months, 0.5 ml as a single dose.

**Side-effects:** See introductory notes; also headache, myalgia, weakness; very rarely encephalitis (infants more susceptible); viscerotropic disease, multiple organ failure (theelderly more susceptible).

**yellow fever vaccine live powder for reconstitution, live, attenuated 17D - 204 strain of yellow fevervirus,Cultivated in chick embryos for S.C inj CMS net price Vial of 10 doses with diluents= 135.00 SDG**

### 13.2.5. Pneumococcal vaccine

**Indications:** Active immunization against Streptococcus pneumoniae.

**Cautions:** Most individuals can safely receive the majority of vaccines. Vaccination may be postponed if the individual is suffering from an acute illness; however, it is not necessary to postpone immunisation in patients with minor

illnesses without fever or systemic upset. See also Predisposition to Neurological Problems, below. For individuals with bleeding disorders, see Route of administration, below. If alcohol or disinfectant is used for cleansing the skin it should be allowed to evaporate before vaccination to prevent possible inactivation of live vaccines. When 2 or more vaccines are required (and are not available as a combined preparation), they should be given simultaneously at different sites, preferably in a different limb; if more than one injection is to be given in the same limb, they should be administered at least 2.5 cm apart. When 2 live vaccines cannot be given at the same time, they should be separated by an interval of at least 4 weeks. **Contra-indications:** Vaccines are contra-indicated in those who have a confirmed anaphylactic reaction to a preceding dose of a vaccine containing the same antigens or vaccine component (such as antibacterials in viral vaccines). The presence of the following excipients in vaccines and immunological products has been noted under the relevant entries:

| | |
|---|---|
| Gelatin | Penicillins |
| Gentamicin | Polymyxin B |
| Kanamycin | Streptomycin |
| Neomycin | Thiomersal |

Hypersensitivity to egg with evidence previous anaphylactic reaction, contra-indicates influenza vaccine tick-borne encephalitis vaccine, and yellow fever vaccine.

**Dose:** Primary immunization against infection by Streptococcus pneumoniae (7-valent conjugate vaccine), by intramuscular injection, infant , 3 doses, each of 0.5 ml, at 6, 10, and 14 weeks of age; alternatively 3 doses, each of 0.5 ml, at 2, 4, and 6 months of age; a reinforcing dose of 0.5 ml can be given at 12–15 months of age;child1–5 years, 0.5 ml as a single dose.

**Pneumomococal polysaccaride vaccine 0.5 ml CMS net price vial = New item**

## 14.Cholinesterase inhibitors

### 14.1. Neostigmine metilsulphate inj 2.5 mg/ 1 ml amp

**Indications:** Myasthenia gravis; reversal of non-depolarizing muscle relaxants administered during surgery, postoperative non-obstructive urinary retention.

**Contraindications:** Recent intestinal or bladder surgery; mechanical intestinal or urinary tract obstruction; after suxamethonium; pneumonia; peritonitis.

**cautions:** Asthma; urinary tract infections; cardiovascular disease including arrhythmias (especially bradycardia, vagotonia, recent myocardial infarction or atrioventricular block).

**Side effects: -** Increased salivation, nausea and vomiting, abdominal cramps, diarrhoea; signs of overdosage include bronchoconstriction, increased bronchial secretions, lacrimation, excessive sweating, involuntary defecation and micturition, miosis, nystagmus, bradycardia, heart block, arrhythmias, hypotension, agitation, excessive dreaming, and weakness eventually leading to fasciculation and paralysis; thrombophlebitis reported; rash associated tablet (bromide salt) formulations.

**Dose:** Myasthenia gravis, by mouth as neostigmine bromide,adult, initially 15–30 mg at suitable intervals throughout the day (usual duration of action 2–4 hours), gradually increased until desired response is obtained; usual total daily dose within range, 75–300 mg, given at appropriate intervals when high doses are required (doses above 180 mg daily are not usually well tolerated) initially 1–2 mg every 4 hours, 30 minutes before feeds;child up to 6 years, initially 7.5 mg; child 6–12 years, initially 15 mg; usual total daily dose,15–90 mg given in divided doses at appropriate intervals. Myasthenia gravis, by subcutaneous or intramuscular injection, adult, 1–2.5 mg as required; usual total daily dose,, 5–20 mg; neonate , 50–250 micrograms every 4 hours, 30 minutes before feeds (not usually required beyond 8 weeks of age);child, 200–500 micrograms as required. Reversal of non-depolarizing block, by intravenous injection over 1 minute,adult, 2.5 mg, followed if necessary by supplements of 500 micrograms to maximum total dose of 5 mg;child, 40 micrograms/kg (titrated using peripheral nerve stimulator). postoperative urinary retention, by subcutaneous or intramuscular injection,adult, 500 micrograms (catheterization required if urine not passed within 1 hour).

**Neostigmine Metil Sulphate 2.5mg/ml for inj. CMS net price Ampoule = 1.200 SDG**

### 14.2.Pyridostigmine bromide

**Indications:** Myasthenia gravis.

**Contraindications:** Recent intestinal or bladder surgery; mechanical intestinal or urinary tract obstruction; after suxamethonium; pneumonia; peritonitis.

**cautions:** Asthma; urinary tract infection; cardiovascular disease including arrhythmias (especially bradycardia or atrioventricular block); hyperthyroidism; hypotension; peptic ulcer; epilepsy; parkinsonism; avoid intravenous injection.

**Side effects:** Muscarinic effects generally weaker than those associated with neostigmine; and include increased salivation, nausea and vomiting, abdominal cramps, and diarrhoea; signs of overdosage include bronchoconstriction, increased bronchial secretions, lacrimation, excessive sweating, involuntary defecation and micturition, miosis, nystagmus, bradycardia, heart block, arrhythmias, hypotension, agitation, excessive dreaming, and weakness eventually leading to fasciculation and paralysis; thrombophlebitis; rash associated with tablet (bromide salt) formulations.

**Dose:** Myasthenia gravis, by mouth,adult, initially 30–120 mg at suitable intervals throughout the day, gradually increased until desired response is obtained; usual total daily dose within range, 0.3–1.2 g, given at appropriate intervals when high doses are required (doses above 450 mg daily are not usually advisable in order to avoid acetylcholine receptor down regulation);childup to 6 years, initially 30 mg;child6–12 years, initially 60 mg; usual totaldaily dose, 30–360 mg given in divided doses at appropriate intervals. Myasthenia gravis, by intramuscular injection,adult, 2 mg every 2–3 hours; neonate, 50–150 micrograms daily, before feeds (but neostigmine usually preferred);child, 1–12 mg daily, given in divided doses at appropriate intervals.

**Pyridostigmine bromide 60mg tablet CMS net price = 0.300 SDG**

### 14.3. Physostigmine Salicylate

**Indications:** Physostigmine is used to treat myasthenia gravis, glaucoma, Alzheimer's disease and delayed gastric emptying. It has been shown to improve the short term memory Recently, it has begun to be used in the treatment of orthostatic hypotension. Because it is a tertiary amine (and thus does not hydrogen bond, making it more hydrophobic), it can cross the blood-brain barrier, and physostigmine salicylate is used to treat the central nervous system effects of atropine, scopolamine and other anticholinergic drug overdoses. Physostigmine is the antidote of choice for Datura stramonium poisoning. It is also an antidote for

Atropa belladonna poisoning, the same as for atropine. It has been also used as an antidote for poisoning with GHB as well, but is poorly effective and often causes additional toxicity, so is not a recommended treatment.

**Cautions:** Because of the possibility of hypersensitivity in an occasional patient, atropine sulfate injection should always be at hand since it is an antagonist and antidote for physostigmine.

**Contraindications:** Physostigmine Salicylate Injection should not be used in the presence of asthma, gangrene, diabetes, cardiovascular disease, mechanical obstruction of the intestine or urogenital tract or any vagotonic state, and in patients receiving choline esters and depolarizing neuromuscular blocking agents (decamethonium, succinylcholine).

For post-anesthesia, the concomitant use of atropine with physostigmine salicylate is not recommended, since the atropine antagonizes the action of physostigmine.

**Side effects:** An overdose can cause cholinergic syndrome. Other side effects may include nausea, vomiting, diarrhea, anorexia, dizziness, headache, stomach pain, sweating, dyspepsia and seizures

**Dose:** Post Anesthesia Care 0.5 to 1.0 mg intramuscularly or intravenously. Dosage may be repeated at intervals of 10 to 30 minutes if desired patient response is not obtained. Pediatric dosage Recommended dosage is 0.02 mg/kg, intramuscularly or by slow intravenous injection, no more than 0.5 mg per minute. If the toxic effects persist, and there is no sign of cholinergic effects, the dosage may be repeated at 5 to 10 minute intervals until a therapeutic effect is obtained or a maximum of 2 mg dosage is attained.

**Physostigmine Salicylate CMS net price = New item**

## 15.Antiasthmatics and medicines for chronic obstructive pulmonary disease

### 15.1.Beclometasone

**Indications:** Chronic asthma not controlled by short-acting beta2-adrenoceptor agonists.

**cautions:** Active or quiescent tuberculosis; systemic therapy may be required during periods of stress or when airway obstruction or mucus prevent drug access to smaller airways; not for relief of acute symptoms; monitor height ofchildren receiving prolonged treatment; if growth is slowed, review therapy; interactions

**Side effects:** Oropharyngeal candidosis, cough, and dysphonia (usually only with high doses); adrenal suppression, growth retardation inchildren and adolescents, impaired bone metabolism, glaucoma, and cataract (with high doses, but less frequent than with systemic corticosteroids); paradoxical bronchospasm (requires discontinuation and alternative therapy but if mild, may be prevented by inhalation of beta2-adrenoceptor agonist or by transfer from aerosol to powder inhalation); rarely urticaria, rash, and angioedema; very rarely anxiety, sleep disorders, and behavioural changes. Candidosis can be reduced by the use of a spacing device ; rinsing the mouth with water after inhalation may also help to prevent candidosis.

**Dose:** Chronic asthma, by aerosol inhalation (standard-dose inhaler),adult, 200 micrograms twice daily or 100 micrograms 3–4 times daily (in more severe cases, initially 600–800 micrograms daily);child, 50–100 micrograms 2–4 times daily or 100–200 micrograms twice daily. Chronic asthma, by aerosol inhalation (high-dose inhaler),adult, 500 micrograms twice daily or 250 micrograms 4 times daily; if necessary may be increased to 500 micrograms 4 times daily;child, not recommended.

**Beclometasone 50 micrograms per dose (dipropionate); CMS net price Inhalation (aerosol), 250 micrograms = New items**

### 15.2. Ipratropium bromide

**Indications:** Chronic asthma; chronic obstructive pulmonary disease.

**cautions:** Prostatic hypertrophy; glaucoma (standard doses unlikely to be harmful but reported with nebulized drug, particularly in association with nebulized salbutamol; care needed to protect patient's eyes from drug powder or nebulized drug); medical supervision necessary for first dose of nebulized solution (risk of paradoxical bronchospasm).

**Side-effects:** Occasionally dry mouth; rarely urinary retention and constipation; tachycardia and atrial fibrillation also reported.

**Dose:** Chronic asthma, chronic obstructive pulmonary disease, by aerosol inhalation,adult, 20–40 micrograms, 3–4 times daily;childup to 6 years, 20 micrograms 3 times daily;child6–12 years, 20–40 micrograms 3 times daily. Chronic obstructive pulmonary disease, by inhalation of nebulized solution,adult, 250–500 micrograms 3–4 times daily. Adjunct in acute bronchospasm, by inhalation of nebulized solution,adult, 500 micrograms repeated as required;childup to 6 years, 125– 250 micrograms; maximum, 1 mg daily;child6–12 years, 250 micrograms; maximum, 1 mg daily.

**Ipratropium bromide 20 mcg/metered dose CMS net price Inhalation (aerosol): = 6.500SDG**

### 15.3.Salbutamol

**Indications:** Prophylaxis and treatment of asthma.

**Cautions:** Hyperthyroidism, myocardial insufficiency, arrhythmias, susceptibility to QT interval prolongation, hypertension; pregnancy (high doses should be given by inhalation because parenteral use can affect the myometrium and possibly cause cardiac problems

**Side-effects:** Hypokalaemia after high doses arrhythmias, tachycardia, palpitations, fine tremor (usually hands), muscle cramps, headache, insomnia, behavioural disturbances inchildren; paradoxical bronchospasm, urticaria, and angioedema also reported; slight pain on intramuscular injection.

**Dose:** Chronic asthma (when inhalation is ineffective), by mouth,adult, 2–4 mg, 3–4 times daily; in some patients up to a maximum of 8 mg 3–4 times daily;childunder 2 years, 100 micrograms/kg 4 times daily;child2–6 years, 1–2 mg 3–4 times daily;child6–12 years, 2 mg 3–4 times daily. Severe acute bronchospasm, by slow intravenous injection adult 250 micrograms, repeated if necessary. Relief of acute bronchospasm, by aerosol inhalation adult, 100–200 micrograms (1–2 puffs) child, 100 micrograms (1 puff) increased to 200 micrograms (2 puffs) if necessary; by intramuscular or subcutaneous injection,adult, 500 micrograms repeated every 4 hours if necessary. Prophylaxis of exercise-induced bronchospasm, aerosol inhalation,adult, 200 micrograms (2 puffs);child, 100 micrograms (1 puff) increased to 200 micrograms (2 puffs) if required. Chronic asthma (as adjunct in stepped treatment), by aerosol inhalation,adult, 100–200 micrograms (1–2 puffs) up to 3–4 times daily;child, 100 micrograms (1 puff) 3–4

times daily, increased to 200 micrograms (2 puffs) 3–4 times daily if necessary. Severe acute asthma, chronic bronchospasm (unresponsive to conventional treatment), by inhalation of nebulized solution,adultandchildover 18 months, 2.5 mg repeated up to 4 times daily; may be increased to 5 mg if necessary (medical assessment should be considered since alternative therapy may be indicated);childunder 18 months, clinical efficacy uncertain (transient hypoxaemia may occur—consider oxygen supplementation).

**Salbutamol 100 micrograms (as sulfate) per dose Inhalation (aerosol) CMS net price = 3.810 SDG**

**Salbutamol 2 mg/5 ml Oral liquid CMS net price Bott= 1.270 SDG**

**Salbutamol 5 mg (as sulfate)/ml Respirator solution for use in nebulizers CMS net price = 18.750 SDG**

**Salbutamol Tablet CMS net price 2 mg; 4 mg (as sulfate) = New item**

### 15.4. Aminophylline

**Indications:** Reversible airways obstruction, severe acute asthma.

**Cautions:** Cardiac arrhythmias or other cardiac disease; hypertension; hyperthyroidism; peptic ulcer; epilepsy; elderly ; fever; hypokalaemia risk,; avoid in acute porphyria monitor plasma-theophylline concentration dose adjustment may be necessary if smoking started or stopped during treatment.

**Side-effects:** Allergy to ethylenediamine can cause urticaria, erythema, and exfoliative dermatitis; hypotension, arrhythmias, and convulsions especially if given rapidly by intravenous injection.

**Dose:** 250–500 mg every 12 hours;child6–12 years 125–250 mg every 12 hours.

**Aminophylline 250 mg for inj CMS net price10ml Ampoule= 1.190 SDG**

### 15.5. Montelukast(as sodium salt)10 mg tablet

**Indications:** Prophylaxis, Management of Chronic Asthma ; symptomatic relief of seasonal allergic rhinitis in patients with asthma.

**Side-effects:** abdominal pain, thirst; hyperkinesia (in youngchildren), headache; very rarely Churg-Strauss syndrome; dry mouth, diarrhoea, dyspepsia, nausea, vomiting, hepatic disorders, palpitation, oedema, increased bleeding, epistaxis, skin reactions, respiratory infections, depression, suicidal thoughts and behaviour, tremor,

asthenia, , hallucinations, paraesthesia, hypoaesthesia, sleep disturbances, sleep-walking, abnormal dreams, agitation, anxiety, aggression, seizures, pyrexia, arthralgia, and myalgia, also reported

**Dose:** Prophylaxis of asthma,adultandchildover 15 years, 10 mg once daily in the evening;child6 months–6 years 4 mg once daily in the evening, 6–15 years 5 mg once daily in the evening. Seasonal allergic rhinitis,adultandchildover 15 years, 10 mg once daily in the evening.

**Montelukast (as sodium salt) 10 mg tablet CMS net price = 1.195012 SDG**

**16. Solutions correcting water, electrolyte and acid–base disturbances**
**16.1.Oral**
**16.2.Parenteral**
**16.3.Miscellaneous1**
**16.1.Oral**
**16.1.1.Oral rehydration salts**

(Glucose: 75 mEq sodium: 75 mEq or mmol/l chloride: 65 mEq or mmol/l potassium: 20 mEq or mmol/l citrate: 10 mmol/l osmolarity: 245 mOsm/l glucose: 13.5 g/l sodium chloride: 2.6 g/l potassium chloride: 1.5 g/l trisodium citrate dihydrate+: 2.9 g/l. + trisodium citrate dihydrate may be replaced by sodium hydrogen carbonate (sodium bicarbonate) 2.5 g/L. However, as the stability of this latter formulation is very poor under tropical conditions, it is only recommended when manufactured for immediate use.

**Glucose salt solution**

| | |
|---|---|
| sodium chloride | 2.6 g/litre of clean water |
| sodium citrate [dihydrate] | 2.9 g/litre of clean water |
| potassium chloride | 1.5 g/litre of clean water |
| glucose (anhydrous) | 13.5 g/litre of clean water |

When glucose and sodium citrate are not available, they may be replaced by

| | |
|---|---|
| sucrose (common sugar) | 27 g/litre of clean water |
| sodium bicarbonate | 2.5 g/litre of clean water |

**Indications:** Dehydration from acute diarrhoea.

**cautions:** Renal impairment

**Side-effects:** Vomiting hypernatraemia and hyperkalaemia result from overdose in renal impairment or administration of too concentrated a solution).

**Dose:** Fluid and electrolyte loss in acute diarrhoea, by mouth,adult, 200–400 ml solution after every loose motion; infant and child, according to Plans A, B, or C

**Plan A:** no dehydration. Nutritional advice, increased fluid intake (in the form of soup, rice, water and yoghurt, or even just water), and zinc supplementation at home are usually sufficient. However, for infants aged under 6 months who have not yet started taking solids, oral rehydration solution must be presented before offering milk. Mother's milk or dried cow's milk must be given without any

particular restrictions. In the case of mixed breast-milk/formula feeding, the contribution of breastfeeding should be increased. Parents should be informed about the circumstances in which they should seek further advice.

**Plan B:** moderate dehydration. Whatever thechild's age, a 4-hour treatment plan is used to avoid short-term problems. It is recommended that parents are shown how to give approximately 75 ml/kg of oral rehydration solution (in small amounts and at regular intervals) over a 4-hour period. It is suggested that parents should be observed to see how they cope at the beginning of the treatment. A larger amount of solution can be given if thechildcontinues to have frequent stools. In the event of vomiting, rehydration must be discontinued for 10 minutes and then resumed at a slower rate. In youngchildren breastfeeding should be continued on demand; olderchildren should receive milk and nutritious food as normal after completing the 4 hours of oral rehydration. Thechild's status must be reassessed after 4 hours to decide on the most appropriate subsequent treatment. Zinc supplementation should begin as soon as thechildcan eat and has completed 4 hours of oral rehydration. Oral rehydration solution should continue to be offered once dehydration has been controlled, for as long as thechildcontinues to have diarrhoea.

**Plan C:** severe dehydration. Hospitalization is necessary, but the most urgent priority is to start rehydration. In hospital (or elsewhere), if thechildcan drink, oral rehydration solution must be given pending, and even during, intravenous infusion (20 ml/kg every hour by mouth before infusion, then 5 ml/kg every hour by mouth during intravenous rehydration). For intravenous supplementation, it is recommended that a compound solution of sodium lactate (or, if this is unavailable, sodium chloride, 0.9% solution) is administered at a rate adapted to thechild's age (infant under 12 months; 30 ml/kg over 1 hour then 70 ml/kg over 5 hours;childover

12 months; 30 ml/kg over 30 minutes then 70 ml/kg over 2.5 hours).

## 16.2.Parenteral

Solutions of electrolytes are given intravenously, to meet normal fluid and electrolyte requirements or to replenish substantial deficits or continuing losses, when the patient is nauseated or vomiting, or is otherwise unable to take adequate amounts by mouth.

### 16.2.1.Glucose

**Indications:** Fluid replacement without significant electrolyte deficit; treatment of hypoglycaemia.

**cautions:** Diabetes mellitus (may require additional insulin).

**Side-effects:** glucose injections, especially if hypertonic, have a low pH and may cause venous irritation and thrombophlebitis; fluid and electrolyte disturbances; oedema or water intoxication (on prolonged administration or rapid infusion of large volumes of isotonic solutions); hyperglycaemia (on prolonged administration of hypertonic solutions).

**Dose:** Fluid replacement, by infusion,adult and child, determined on the basis of clinical and, whenever possible, electrolyte monitoring .Treatment of hypoglycaemia, *by* intravenous infusion of 50% glucose solution into a large vein,adult, 25 ml.

**Dextrose anhydrous or mono hydrate 5% in water solution for IV..infusion CMS net price.500ml with air vent set = 2.900 SDG, 10% in water solution for IV.infusion 500ml with air vent set = 2.600 SDG-3.720 SDG**

**Dextrose anhydrous or monohydrate 50%in water solution CSM net price = 1.600 SDG**

**Dextrose anhydrous or monohydrate 5% in water solution for IV..infusion. CMS net price 50ml with air vent set injection = 2.741648 SDG**

**Dextrose anhydrous or mono hydrate 5% in water solution for IV..infusion CMS net price 100ml with air vent set= 2.940392 SDG**

**Dextrose anhydrous or mono hydrate5% in water solution for IV..infusion CMS net price 250ml with air vent set = 3.918824 SDG**

### 16.2.2.Glucose with sodium chloride

**Indications:** Fluid and electrolyte replacement.

**Cautions:** Restrict intake in impaired renal function, cardiac failure, hypertension, peripheral and pulmonary oedema, and toxaemia during pregnancy.

**Dose:** Fluid replacement, by intravenous infusion,adult and child, determined on the basis of clinical and, whenever possible, electrolyte monitoring.

**Side-effects:** Administration of large doses may give rise to oedema.

**Dextrose anhydrous or mono hydrate 5%in sodium chloride 0.18% solution for IV.infusion. CMS net price = 3.360 SDG**

**Dextrose anhydrous or mono hydrate 5%in sodium chloride 0.45% solution for IV.infusion CMS net price 500ml with air vent set= 3.720 SDG**

Dextrose anhydrous or mono hydrate 5%in sodium chloride 0.45% solution for IV.infusion

CMS net price100ml with air vent set= 3.429608 SDG

Dextrose anhydrous or mono hydrate 5%in sodium chloride 0.45% solution for IV.infusion

CMS net price 250ml with air vent set = 2.26772 SDG

Dextrose anhydrous or mono hydrate 5%in sodium chloride 0.9% solution for IV.infusion

CMS net price 250ml with air vent set = 2.26772 SDG

Dextrose anhydrous or mono hydrate 5%in sodium chloride 0.9% solution for IV..infusion

CMS net price 100ml with air = 2.940392 SDG

Dextrose anhydrous or mono hydrate 5%in sodium chloride 0.18% solution for IV.infusion.

CMS net price 50 ml with air vent set vent set= 2.940392 SDG

Dextrose anhydrous or mono hydrate 5%in sodium chloride 0.18% solution for IV.infusion

CMS net price100 ml with air vent set = 3.429608 SDG

Dextrose anhydrous or mono hydrate 5%in sodium chloride 0.45% solution for IV.infusion

CMS net price 50ml with air vent set= 2.940392 SDG

Dextrose anhydrous or mono hydrate 5%in sodium chloride 0.9% solution for IV..infusion

CMS net price 50ml with air vent set= 2.940392 SDG

### 16.2.3. Sodium chloride

**Indications:** Electrolyte and fluid replacement.

**Cautions:** Restrict intake in impaired renal function ,cardiac failure, hypertension, peripheral and pulmonary oedema, and toxaemia during pregnancy.

**Side effects:** Administration of large doses may give rise to sodium accumulation and oedema.

**Dose:** Fluid and electrolyte replacement, by intravenous infusion,adultandchild, determined on the basis of clinical and, whenever possible, electrolyte monitoring (see also introductory note above).

Sodium chloride 0.9% solution for IV..infusion CMS net price 500ml with air vent set =2.900 SDG

Sodium chloride 0.9% solution for IV..infusion CMS net price 50ml with air vent set= 2.695784 SDG

Sodium chloride 0.9% solution for IV..infusion CMS net price 100ml with air vent set=2.940392 SDG

Sodium chloride 0.9% solution for IV..infusion CMS net price 250ml with air vent set= 4.214392 SDG

hypertonic NaCl ( 3 %) CMS net price 4 ml ampoule= New item

sodium chloride 13.4% CMS net price ampoules = New item

### 16.2.4.Sodium hydrogen carbonate

**Indications:** Metabolic acidosis.

**Contraindications:** Metabolic or respiratory alkalosis, hypocalcaemia, hypochlorhydria.

**Cautions:** Restrict intake in impaired renal function , cardiac failure, hypertension, peripheral and pulmonary oedema, and toxaemia during pregnancy; monitor electrolytes and acid base status.

**Side effects:** Excessive administration may cause hypokalaemia and metabolic alkalosis, especially in renal impairment; large doses may give rise to sodium accumulation and oedema.

**Dose:** Metabolic acidosis, by slow intravenous injection of a strong solution (up to 8.4%) or by continuous intravenous infusion of a weaker solution (usually 1.4%),adult and child, an amount appropriate to the body base deficit.

**Sodium bicarbonate 8.4 % CMS net price 50 ml= 3.46528 SDG**

### 16.2.5. Sodium lactate, compound solution

**indications:** Pre and perioperative fluid and electrolyte replacement; hypovolaemic shock.

**Contraindications:** Metabolic or respiratory alkalosis; hypocalcaemia or hypochlorhydria.

**cautions:** Restrict intake in impaired renal function, cardiac failure, hypertension, peripheral and pulmonary oedema, and toxaemia during pregnancy

**Side effects:** Excessive administration may cause metabolic alkalosis; administration of large doses may give rise to oedema.

**Dose:** Fluid and electrolyte replacement or hypovolaemic shock, by intravenous infusion,adultandchild, determined on the basis of clinical and, whenever possible, electrolyte monitoring (see also introductory note above).

**Sodium lactate CMS net price = New item**



### 16.2.6. Potassium chloride

**Indications:** Electrolyte imbalance; see also oral potassium supplements

**Cautions:** For intravenous infusion the concentration of solution should not usually exceed 3 g (40 mmol)/litre; specialist advice and ECG monitoring.

**Contra-indications:** plasma-potassium concentration above 5 mmol/litre,

**Side-effects:** rapid infusion toxic to heart.

**Dose:** By slow intravenous infusion, depending on the deficit or the daily maintenance requirements.

**Potassium Chloride 150mg/ml inj for CMS net price 10ml Ampoule = 0.250 SDG**

### 16.2.7.Magnesium sulphate injection 50% in 10 ml

**Indications:** Hypomagnesaemia , Since magnesium is secreted in large amounts in the gastro-intestinal fluid, excessive losses in diarrhoea, stoma or fistula are the most common causes of hypomagnesaemia; deficiency may also occur in alcoholism or as a

result of treatment with certain drugs. Hypomagnesaemia causes secondary hypocalcaemia, and also hypokalaemia and hyponatraemia. Symptomatic hypomagnesaemia is associated with a deficit of 0.5–1 mmol/kg; up to 160 mmol $Mg^{2+}$ over up to 5 days may be required to replace the deficit (allowing for urinary losses). Magnesium is given initially by intravenous infusion or by intramuscular injection of magnesium sulphate; the intramuscular injection is painful. Plasma magnesium concentration should be measured to determine the rate and duration of infusion and the dose should be reduced in renal impairment. To prevent recurrence of the deficit, magnesium may be given by mouth in a dose of 24 mmol $Mg^{2+}$ daily in divided doses; suitable preparations are magnesium glycerophosphate tablets or liquid. For maintenance (e.g. in intravenous nutrition), parenteral doses of magnesium are of the order of 10–20 mmol $Mg^{2+}$ daily (often about 12 mmol $Mg^{2+}$ daily).

**Cautions:** Severe hypomagnesaemia administer initially via controlled infusion device (preferably syringe pump); monitor blood pressure, respiratory rate, urinary output and for signs of overdosage (loss of patellar reflexes, weakness, nausea, sensation of warmth, flushing, drowsiness, double vision, and slurred speech.

**Side-effects:** Generally associated with hypermagnesaemia, nausea, vomiting, thirst, flushing of skin, hypotension, arrhythmias, coma, respiratory depression, drowsiness, confusion, loss of tendon reflexes, muscle weakness; colic and diarrhoea following oral administration.

**Dose:** Hypomagnesaemia , Arrhythmias, Prevention of seizures in pre-eclampsia [unlicensed indication], initially by intravenous injection over 5–15 minutes, 4 g followed by intravenous infusion, 1 g/hour for 24 hours; if seizure occurs, additional dose by intravenous injection, 2 g. Treatment of seizures and prevention of seizure recurrence in eclampsia, initially by intravenous injection over 5–15 minutes, 4 g, followed by intravenous infusion, 1 g/hour for 24 hours after seizure or delivery, whichever is later; if seizure recurs, increase the infusion rate to 1.5–2 g/hour or give an additional dose by intravenousinjection, 2 g. For intravenous injection concentration of magnesium sulphateshould not exceed 20% (dilute 1 part of magnesium sulphate injection50% with at least 1.5 parts of water for injections).

**Magnesium Sulphate 50% CMS net price 10ml Ampoule = 2.500 SDG, 100mg/ml in 5ml Amp= 1.500 SDG**

### 16.3. Miscellaneous

#### 16.3.1.Water for injection

**Uses:** in preparations intended for parenteral administration and in other sterile preparations.

**Water for injection CMS net price 2 ml Ampoule = 0.280 SDG,5-ml Amp = 0.108545 SDG**

**10-ml Amp= New item**

## 17-Disinfectants and antiseptics

## 17.1. Antiseptics

## 17.2. Disinfectants

## 17.1. Antiseptics

### 17.1.1.Chlorhexidine

**Indications:** Antiseptic; disinfection of clean instruments.
**cautions:** aqueous solutions (which are susceptible to microbial contamination should be freshly prepared; appropriate measures required to prevent contamination during storage or dilution); instruments with cemented glass components (avoid preparations containing surface active agents); irritant (avoid contact with middle ear, eyes, brain, and meninges); not for use in body cavities; alcoholic solutions not suitable before diathermy; syringes and needles treated with chlorhexidine (rinse thoroughly with sterile water or saline before use); inactivated by cork (use glass, plastic or rubber closures); alcohol-based solutions are flammable.
**Side effects:** Occasional skin sensitivity and irritation.
**Administration:** Antiseptic (pre-operative skin disinfection and hand washing),adult and child, use 0.5% solution in alcohol (70%) or 2 or 4% detergent solution to the skin area. Antiseptic (wounds, burns, and other skin damage),adult and child apply 0.05% aqueous solution directly to the affected area. Disinfection of clean instruments, immerse for at least 30 minutes in 0.05% solution containing sodium nitrite 0.1% (to inhibit metal corrosion). Emergency disinfection of clean instruments, immerse for 2 minutes in 0.5% solution in alcohol (70%).

**Chlorhexidine Chlorohexidine .3% + cetrimide 3% soluion CMS net price = 56.28 SDG**

### 17.1.2.Ethanol

Ethanol is a representative disinfectant and antiseptic. Various agents can serve as alternatives.
**Indications:** Disinfection of skin prior to injection, venepuncture, or surgical procedures.
**Cautions:** flammable; avoid broken skin; patients have suffered severe burns when diathermy has been preceded by application of alcoholic skin disinfectants.

**Side-effects:** skin dryness and irritation with frequent application.
**Administration:** Disinfection of skin,adult and child, apply undiluted solution directly to the skin area.

**Ethanol Solution CMS net price LIT= 4.812 SDG**

### 17.1.3-Polyvidone iodine

Also known as Povidone–iodine.

Polyvidone iodine is a representative antiseptic. Various agents can serve as alternatives.

**Indications:** Antiseptic; skin disinfection.

**Contraindications:** Avoid regular or prolonged use in patients with thyroid disorders or those taking lithium; avoid regular use in neonates; avoid in very low-birth-weight infants.

**cautions:** Pregnancy and breastfeeding broken skin and renal impairment .

The application of polyvidone iodine to large wounds or severe burns may produce systemic adverse effects such as metabolic acidosis, hypernatraemia, and impairment of renal function.

**Side effects:** Irritation of skin and mucous membranes; may interfere with thyroid function tests; systemic effects (see under Precautions).

**Administration:** Pre and post-operative skin disinfection adult and child, apply undiluted solution to the skin area. Antiseptic adult and child, apply undiluted solution to the affected area, twice daily.

**Polyvidone iodine7.5% Solution CMS net price 500ml= 14.400 SDG,10%= 10.810 SDG**



## 17.2. Disinfectants

### 17.2.1-Chloroxylenol

Solution: 4.8%.

Chloroxylenol is a representative disinfectant and antiseptic. Various agents can serve as alternatives.

**Indications:** Antiseptic; disinfection of instruments and surfaces.

**Cautions:** Aqueous solutions (which are susceptible to microbial contamination) should be freshly prepared; appropriate measures required to prevent contamination during storage or dilution.

**Side effects:** Skin sensitivity reported.

**Administration:** Antiseptic (wounds and other skin damage), apply a 1 in 20 dilution of 5% concentrate in water to the affected area. Disinfection of instruments, immerse a 1 in 20 dilution of 5% concentrate in alcohol (70%).

According to manufacturer's directions.

**Chloroxylenol 4.8% solution CMS net price = 63.600 SDG**

### 17.2.2.Glutaral

**Indications:** Disinfection and sterilization of instruments and surfaces.

**cautions:** Minimize occupational exposure (adequate skin protection and measures to avoid inhalation of vapour).

**Side effects:** (Occupational exposure) nausea, headache, airway obstruction, asthma, rhinitis, eye irritation, dermatitis, and skin discoloration.

**Administration:** Disinfection of clean instruments, immerse in undiluted solution for 10– 20 minutes; up to 3 hours may be required for certain instruments (for example, bronchoscopes with possible mycobacterial contamination); rinse with sterile water or alcohol after disinfection.

Sterilization of clean instruments, immerse in undiluted solution for up to 10 hours; rinse with sterile water or alcohol after disinfection.

**Glutaral 2% Solution CMS net price =New item**

## 18. Diagnostic agents

| |
|---|
| Tuberculin PPD (Purified protein derivative) Intradermal 2 U/0.1ml in 2ml vial<br>**CMS net price= 4.3316 SDG** |
| Anti-A sera test 10ml Titration: (1/128) Avidity 10 seconds<br>**CMS net price = 8.1536 SDG** |
| Anti A1 lectin sera Volume: 5ml Titration: (1/128) Avidity: 15 seconds<br>**CMS net price = 41.7872 SDG** |
| Anti B sera 10ml Titration: (1/128) Avidity: 10 seconds<br>**CMS net price = 8.1536 SDG** |
| Anti-C sera 5 ML (big)<br>**CMS net price = 55.092 SDG** |
| Anti-c sera 5 ML (small)<br>**CMS net price = 79.589 SDG** |
| Anti-D sera test: Avidity of anti D(IgM+IgG): 30-60 seconds Avidity of anti D( IgG only): directly after addition of AHG Titration of anti D(IgM+IgG): (1/8) Titration of anti D(IgG only): (1/132)<br>**CMS net price = 12.74 SDG** |
| Anti-e sera test 5ml(small) |
| Anti- CDE sera test<br>**CMS net price = 305.76 SDG** |
| Anti-human globulin(coombs) 5ml.bottle Poly specific Anti-human globulin (AHG) wich contain IgG Abs+C3b complement factor. Specific reactive with sensitized cells only. Labelling contain in minimum. Poly specific information. Production date. Expiration date not less than two years from production date.<br>**CMS net price = 6.1152 SDG** |
| HIV Elisa kits The solid phase of the test kit should be standard microplate ELISA coated with HIV I,II, including subgroup (O), recombinant and/or synthetic peptide antigen . The assay should be fourth generation ELISA. The assay should detect HIV-I (all subtype) & II antibodies and P24 Antigen. The assay should be able to detect antibodies to HIV I/II during early sero-conversion period.Evidence based sero-conversion data should be from WHO accredited.The assay should include reactive and non-reactive controls with each kit. All reagents and accessories necessary to |

perform he test should also be included The kit should have a shelf life of minimal 12 months (at ambient temperature) at the port of discharge of consignee's end which ever is applicable .Adequate literature provided with each kit:

**CMS net price = 168.168 SDG**

HCV Elisa kits The solid phase of the test kit should be standard microplate ( 96 well) ELISA coated with recombinant and/or synthetic peptide antigen for core, NS3, NS4 and NS5.

The assay should be at least fourth generation ELISA, approved by accredited center by WHO.

**CMS net price = 168.168 SDG**

HBs Ag Elisa kits The solid phase of the test kit should be standard microplate (96 well) ELISA coated with monoclonal antibodies.

The assay should be at least fourth generation ELISA, approved by accredited center by WHO.

**CMS net price = 76.44 SDG**

Syphilis Elisa kits The solid phase of the test kit should be standard microplate ( 96 well) ELISA coated with Treponema pallidum extract anigen.The assay should be able to detect total human antibodies to Treponema pallidum.The assay should include reactive and non-reactive controls with each kit. All reagents and accessories necessary to perform he test should also be included .The kit should have a shelf life of minimal 12 months (at ambient temperature) at the port of discharge of consignee's end which ever is applicable .

**CMS net price = 168.168 SDG**

HIV Simple/Rapid Test kits The solid phase of the test kit should be coated with synthetic/ recombinant HIV I,HIV II, including HIV I subtype (O).

The assay should be able to detect HIV-I & HIV II by immune-enzyme/agglutination/ any other acceptable principle. The assay should be able to detect antibodies of HIV I& HIV II during early sero-conversion period.

The product should include reactive and non-reactive controls with each kit. All reagents and accessories necessary to perform the test. The kit should have a shelf life of minimal 12 months at the port of discharge of consignee's end which ever is applicable
The total procedure time should not be more than 30 minutes.
The kit should enable performing a single test at time.
The packaging size should not be more than 50 test per kit.

**CMS net price = 2.0384 SDG**

| |
|---|
| HCV Rapid test The solid phase of the test kit should be coated with monoclonal/ synthetic peptide antigen for core, NS3, NS4 and NS5.<br><br>The assay should be able to detect HCV to all geno-types.<br>The assay should include reactive and non-reactive controls with each kit. All reagents and accessories necessary to perform the test should be included.<br><br>The kit should have a shelf life of minimal 12 months at the port of discharge of consignee's end which ever is applicable.<br><br>**CMS net price = 2.0384 SDG** |
| HBV Rapid test The solid phase of the test kit should be coated with monoclonal antibodies (Anti-HBs). The assay should be able to detect HBs Ag to all sub-types. The assay should include reactive and non-reactive controls with each kit. All reagents and accessories necessary to perform the test should be included. The kit should have a shelf life of minimal 12 months at the port of discharge of consignee's end which ever is applicable |
| Syphilis Rapid test. The solid phase of the test kit should be a serological chromatographic or agglutination test using recombinant antigen.<br><br>The assay should include reactive and non-reactive controls with each kit. All reagents and accessories necessary to perform the test should be included.<br><br>The kit should have a shelf life of minimal 12 months at the port of discharge of consignee's end which ever is applicable.<br><br>**CMS net price = 1.0192 SDG** |
| Anti-E sera test 5ml (big)<br><br>**CMS net price = 36.000 SDG** |
| Anti sera D (IgG only) 10 ml<br><br>**CMS net price = 21.600 SDG** |

## Appendix : 1 Consumable

| Item | Unit | Price |
|---|---|---|
| Absorbable haemostate collagen 5cm x8cm. | PCS | 18.276 |
| Absorbent gauze 90 cmx90m | ROL | 66.000 |
| Absorbent gauze 90 cmx90m | ROL | 66.000 |
| Adhesive plaster 5cm x5m zinc oxide | ROL | 1.820 |
| Blood bags single 450ml | BAG | 12.000 |
| Blood bags single 450ml without set | BAG | 9.260 |
| Blood bags triple( cpda-1) 450ml | BAG | 19.540 |
| Blood bags triple( cpda-1) 450ml | BAG | 22.800 |
| Blood lancet box of 100pcs | PCS | 38.500 |
| Blood lancet box of 200 pcs | PCS | 9.600 |
| Blood lancet box of 200 pcs | PCS | 9.090 |
| Blood transfusion set | SET | 0.982 |
| Blood transfusion set | SET | 3.060 |
| C.s.f flow contoured shunt high pressure | PCS | 720.000 |
| C.s.f flow contoured shunt small medium pressure | PCS | 648.000 |
| Chromic catgut suture 2 (75cm)1/2 circle round bodied 50mm needle | FOL | 2.040 |
| Chromic catgut suture 2/0 (75cm), 1/2 circle round bodied 30mm needle | FOL | 2.820 |
| Chromic catgut suture 2/0 (75cm), 1/2 circle round bodied 30mm needle | FOL | 1.700 |
| Chromic catgut suture 4/0(75cm)1/2 circle round bodied 30mm needle | FOL | 2.110 |
| Chromic catgut suture1 (75cm)1/2 circle round bodied 30mm needle | FOL | 1.840 |

| Item | Unit | Price |
|---|---|---|
| Clostomy bag size 50mm | PCS | 1.150 |
| Clostomy bag size 60mm | PCS | 1.150 |
| Clostomy bag size 70mm | PCS | 1.760 |
| Cotton absorbent 500g | ROL | 14.400 |
| Cotton absorbent 500g | ROL | 14.400 |
| Cotton absorbent 500g | ROL | 14.400 |
| Cotton absorbent 500g | ROL | 14.400 |
| Crepe bandage 7.5cm4.5cm | ROL | 1.800 |
| Crepe bandage 7.5cm4.5cm | ROL | 0.700 |
| Crepe bandage 7.5cm4.5cm | ROL | 0.690 |
| Disposable syringe 1ml | PCS | 0.160 |
| Disposable syringe 1ml | PCS | 0.180 |
| Disposable syringe 1ml | PCS | 0.150 |
| Disposable syringe 20ml | PCS | 0.330 |
| Disposable syringe 3ml | PCS | 0.140 |
| Disposable syringe 5ml | PCS | 0.140 |
| Disposable syringe 5ml | PCS | 0.100 |
| Disposable syringe10ml | PCS | 0.190 |
| Disposable syringe10ml | PCS | 0.250 |
| Examination gloves large size | PCS | 0.160 |
| Examination gloves large size | PCS | 0.160 |

| Item | Unit | Price |
|---|---|---|
| Examination gloves medium size | PCS | 0.150 |
| Folly catheter 3ways size 18 | PCS | 2.110 |
| Folly catheter 3ways size 20 | PCS | 2.110 |
| Folly catheter 3ways size 22 | PCS | 2.110 |
| Folly catheter size 10 | PCS | 2.110 |
| Folly catheter size 10 | PCS | 2.070 |
| Folly catheter size 10 | PCS | 2.100 |
| Folly catheter size 12 | PCS | 2.110 |
| Folly catheter size 14 | PCS | 0.876 |
| Folly catheter size 14 | PCS | 2.100 |
| Folly catheter size 14 | PCS | 2.110 |
| Folly catheter size 16 | PCS | 2.110 |
| Folly catheter size 18 | PCS | 2.110 |
| Folly catheter size 20 | PCS | 2.110 |
| Folly catheter size 6 | PCS | 2.400 |
| Folly catheter size 6 | PCS | 2.040 |
| Folly catheter size 8 | PCS | 2.400 |
| Folly catheter size 8 | PCS | 2.160 |
| Folly catheter size 8 | PCS | 2.100 |
| Gauze bandag 7.5 cmx4.5m | ROL | 0.180 |
| Gauze bandag 7.5 cmx4.5m | ROL | 0.200 |

| Item | Unit | Price |
|---|---|---|
| Gauze bandag 7.5 cmx4.5m | ROL | 0.260 |
| Haemoglobin 301 microcuvettes | PCS | 1.400 |
| Insulin pen 3 grey | PCS | 128.836 |
| Iv infusion set | SET | 0.300 |
| Nasogastric tub(infant) size 8 | PCS | 0.600 |
| Nasogastric tub(infant) size 8 | PCS | 0.490 |
| Nasogastric tub(infant) size 8 | PCS | 0.950 |
| Nasogastric tube(adult) size 16 | PCS | 0.960 |
| Nasogastric tube(adult) size 16 | PCS | 0.600 |
| Nasogastric tube(adult) size 16 | PCS | 0.600 |
| Nasogastric tube(adult) size 18 | PCS | 0.960 |
| Nasogastric tube(adult) size 18 | PCS | 0.600 |
| Nasogastric tube(infant) size 5 | PCS | 0.600 |
| Nasogastric tube(infant) size 5 | PCS | 0.490 |
| Nasogastric tube(infant) size 5 | PCS | 0.720 |
| Non-absorbable monofilament polypropylene mesh size 15cmx15cm. | PCS | 61.800 |
| Non-absorbable monofilament polypropylene mesh size 30cmx30cm. | PCS | 132.600 |
| Non-absorbable monofilament polypropylene mesh size 30cmx30cm. | PCS | 90.000 |
| Plain catgut suture 0 (75cm)1/2 circle roud bodied 40mm needle | FOL | 1.106 |
| Plain catgut suture 2/0 (75cm) 1/2 circle roud bodied 40mm needle | FOL | 1.000 |
| Plain catgut suture 2/0 (75cm) 1/2 circle roud bodied 40mm needle | FOL | 1.114 |

| Item | Unit | Price |
|---|---|---|
| Plaster of paris 6inch | ROL | 1.550 |
| Plaster of paris 6inch | ROL | 1.520 |
| Plaster of paris 6inch | ROL | 1.200 |
| Plaster of paris 8 inch | ROL | 2.020 |
| Plaster of paris 8 inch | ROL | 2.120 |
| Plastic test tube size 2.5 | TUB | 0.109 |
| Polyamide (black) suture 0 (1m)1/2 circle round bodied heavey needle 40mm. | FOL | 2.700 |
| Polyamide (black) suture 0 (1m)1/2 circle round bodied heavey needle 40mm. | FOL | 0.500 |
| Polyamide (black) suture 1 (1m)1/2circle round bodied heavey 50mm needle | FOL | 2.700 |
| Polyamide (black) suture 1 (1m)1/2circle round bodied heavey 50mm needle | FOL | 0.600 |
| Polyamide (black) suture 1 (1m)1/2circle round bodied heavey 50mm needle | FOL | 1.970 |
| Polyamide (black) suture size 0 (1m)-1/2 circle reverse cutting heavey .40mm needle | FOL | 0.500 |
| Polydioxanone suture 4/0 (70cm)3/8 circle curved round bodied 16mm needle. | FOL | 2.800 |
| Polydioxanone suture 6/0 (45cm) 3/8 circle round bodied 13mm needle. | FOL | 3.070 |
| Polydioxanone suture 6/0 (45cm)1/2 circle round bodied 13mm needle. | FOL | 3.070 |
| Polydioxanone suture5/0 (1m)3/8 circle round bodied 16mm needle. | FOL | 2.800 |
| Polyglactic 910 violet coated braided suture 4/0 (75cm) 1/2circle round bodied 30 mm needle | FOL | 4.020 |
| Polyglactic 910 violet coated braided suture 4/0 (75cm) 1/2circle round bodied 30 mm needle | FOL | 5.370 |
| Polyglycolic acid coated braided suture 2 (75cm) 1/2circle round bodied 40mm needle | FOL | 4.200 |
| Polyglycolic acid coated braided suture 2 (75cm) 1/2circle round bodied 40mm needle | FOL | 4.200 |
| Polyglycolic acid coated braided suture 2 (75cm) 1/2circle round bodied 40mm needle | FOL | 3.600 |

| Item | Unit | Price |
|---|---|---|
| Polyglycolic acid coated braided suture 3/0 (75cm) 1/2circle round bodied 40mm needle | FOL | 3.280 |
| Polyglycolic acid coated braided suture 3/0 (75cm) 1/2circle round bodied 40mm needle | FOL | 3.240 |
| Polyglycolic acid coated braided suture 0 (70cm)1/2 circle round bodied 40mm needle | FOL | 3.540 |
| Polyglycolic acid coated braided suture 0 (70cm)1/2 circle round bodied 40mm needle | FOL | 6.690 |
| Polyglycolic acid coated braided suture 0 (70cm)1/2 circle round bodied 40mm needle | FOL | 3.540 |
| Polyglycolic acid coated braided suture 1(75cm)1/2 circle round bodied 40mm needle | FOL | 3.880 |
| Polyglycolic acid coated braided suture 1(75cm)1/2 circle round bodied 40mm needle | FOL | 3.880 |
| Polyglycolic acid coated braided suture 1(75cm)1/2 circle round bodied 40mm needle | FOL | 3.300 |
| Polyglycolic acid coated braided suture 5/0(75cm)1/2 circle round bodied 17mm needle | FOL | 5.770 |
| Polyglycolic acid coated braided suture 6/0(75cm)1/2 circle round bodied 17mm needle | FOL | 5.300 |
| Polyglycolic acid coated braided suture size1(75cm)1/2 circle taper point 40mm needle | FOL | 3.500 |
| Polyglycolic acid coated suture 2/0(75cm)1/2 circle round bodied 30mm needle | FOL | 3.400 |
| Polyglycolic acid coated suture 2/0(75cm)1/2 circle round bodied 30mm needle | FOL | 3.500 |
| Polyglycolic acid coated suture 2/0(75cm)1/2 circle round bodied 30mm needle | FOL | 3.600 |
| Polyglycolic acid suture 1 (75cm) 1/2 circle round bodied 30mm neddle | FOL | 3.540 |
| Polyglycolic acid suture 4/0(75cm)1/2circle round bodied 30mm needle | FOL | 3.500 |
| Polyglycolic acid suture 4/0(75cm)1/2circle round bodied 30mm needle | FOL | 5.080 |
| Polypropylene monofilament suture 7/0(60cm)- 3/8 circle rounded bodied double 8 mm needle diam.330 micron | FOL | 8.292 |
| Polypropylene monofilament suture 0 (75cm)1/2circle round bodied 35mm double needle | FOL | 0.719 |
| Polypropylene monofilament suture 1 (1m)1/2circle round bodied 40mm needle | FOL | 0.719 |
| Polypropylene monofilament suture 1 (1m)1/2circle round bodied 40mm needle | FOL | 1.000 |

| Item | Unit | Price |
|---|---|---|
| Polypropylene monofilament suture 2/0 (75cm) 3/8 circle cutting 30mm needle | FOL | 3.190 |
| Polypropylene monofilament suture3/0 (90cm)1/2circle round bodied 8mm,16mm double needle | FOL | 1.000 |
| Polypropylene monofilament suture5/0(75cm)3/8circle round bodied 13mm needle | FOL | 1.000 |
| Safety box | BOX | 10.908 |
| Silk black braided coated suture 2(75cm)1/2circle taper cutting 37mm needle | FOL | 0.650 |
| Silk black braided coated suture size 2/0(75cm)-1/2 circle round bodied 26mm needle | FOL | 1.980 |
| Silk black braided coated suture1(75cm)1/2circle round bodied 40mm needle | FOL | 0.700 |
| Silk black braided suture 2 (50m ). | ROL | 16.500 |
| Silk black braided suture 2 (75cm), 1/2 circle round bodied 40mm needle | FOL | 0.700 |
| Silk black braided suture 2 (75cm)1/2circle round bodied 37mm needle | FOL | 0.750 |
| Silk black braided suture 2(75cm)1/2circle round bodied 40mm needle | FOL | 0.700 |
| Silk black braided suture 2(75cm)1/2circle round bodied 40mm needle | FOL | 0.700 |
| Silk black braided suture 8/0 (45cm) 3/8 reverse cutting 8mm needle | FOL | 2.870 |
| Silk black braided suture size 0 (50m). | FOL | 21.832 |
| Silk black braided suture size 0 (75cm)-1/2 circle reverse cutting 50mm needle | FOL | 0.700 |
| Silk black braided suture size 0 (75cm)-1/2 circlecurved cutting 40mm needle | FOL | 0.700 |
| Silk black braided suture size 0 (75cm)-3/8 circle round bodied double 30mm needle | FOL | 0.750 |
| Silk black braided suture size 0(75cm)-1/2 circle round bodied 30mm needle | FOL | 0.700 |
| Silk black braided suture size 0(75cm)-1/2 circle round bodied 30mm needle | FOL | 0.700 |
| Silk black braided suture size 3/0 (75cm)-3/8 circle cutting 18mm needle | FOL | 0.516 |
| Silk black braided suture size 3/0(75cm)-1/2 circle round bodied 20mm needle | FOL | 1.900 |

| Item | Unit | Price |
|---|---|---|
| Silk black braided suture size 4/0 (45cm)-3/8 circle cutting 18.5mm needle | FOL | 2.424 |
| Silk black braided suture size 5/0 (75cm)-1/2 circle curved cutting 30mm needle | FOL | 2.424 |
| Silk black braided suture1 (50m ). | ROL | 25.968 |
| Silk black braided suture2 (75cm)1/2circle round bodied 40mm needle | FOL | 0.700 |
| Silk black braidedsuture size 3/0 (75)cm-1/2 circle round bodied 40mm needle | FOL | 0.800 |
| Silk blak braided suture size 2/0 (75cm) 1/2 circle reverse cutting 25mm needle | FOL | 0.700 |
| Silk blak braided suture size 2/0 (75cm) 1/2 circle reverse cutting 25mm needle | FOL | 0.700 |
| Silk blak braided suture1 (75cm)1/2 circle round bodied 40mm needle | FOL | 0.700 |
| Soft conformable orthpedic padding cotton size 4 inc (100mm3m) | ROL | 0.600 |
| Soft conformable orthpedic padding cotton size 6 inc (150mm3m) | ROL | 0.950 |
| Soft conformable orthpedic padding cotton size 8 inc (200mm3m) | ROL | 1.250 |
| Sterile iv canula size 16 | PCS | 0.700 |
| Sterile iv canula size 18 | PCS | 0.750 |
| Sterile iv canula size 20 | PCS | 0.700 |
| Sterile iv canula size 20 | PCS | 0.700 |
| Sterile iv canula size 22 | PCS | 0.700 |
| Sterile iv canula size 24 | PCS | 0.800 |
| Sterile surgical gloves size 7 | PAR | 0.870 |
| Sterile surgical gloves size 7 | PAR | 0.850 |
| Sterile surgical gloves size 7.5 | PAR | 0.850 |
| Sterile surgical gloves size 7.5 | PAR | 0.850 |

| Item | Unit | Price |
|---|---|---|
| Sterile surgical gloves size 8.5 | PAR | 0.850 |
| Sterile surgical gloves size 8.5 | PAR | 0.850 |
| Sterile surgical glovesl size 8 | PAR | 0.850 |
| Surgical blade without handle size 11 box of 100 pcs | PCS | 10.258 |
| Surgical blade without handle size 22 box of 100 pcs | PCS | 19.200 |
| Surgical blade without handle size 23 box of 100 pcs | PCS | 22.800 |
| Surgical blade without handle size 24 box of 100 pcs | PCS | 22.800 |
| Surgical bladewithout handle size 15 box of 100 pcs | PCS | 11.100 |
| Surgical bladewithout handle size 18 box of 100 pcs | PCS | 10.258 |
| Uretric catheter sterile length 70cm ,06 black size 6 | PCS | 11.904 |
| Urine bag 2000ml un sterile | BAG | 1.440 |
| Urine bag 2000ml un sterile | BAG | 1.320 |
| Urine bag 2000ml un sterile | BAG | 2.000 |
| Ventricular shunt low pressure | PCS | 660.000 |
| Violet polyglactic 910 coated braided suture 2/0 (75cm) 1/2circle round bodied 30 mm needle | FOL | 4.320 |
| Zinc oxide plaster 7.5cmx4.5m | ROL | 2.200 |

## Appendix 2:Drug – Drug Interactions

Two or more drugs given at the same time may interact with each other. The interaction may be potentiation or antagonism of one drug by another, or occasionally some other effect. Drug interactions may be pharmacodynamic or pharmacokinetic.

Pharmacodynamic interactions occur between drugs which have similar or antagonistic pharmacological effects or adverse effects. They are usually predictable from a knowledge of the pharmacology of the interacting drugs and given the fact that an interaction occurring with one drug is likely to occur with a related drug. Pharmacodynamic interactions may be due to:

• competition at receptor sites,
• drugs acting on the same physiological system.

Pharmacodynamic interactions occur to some extent in most patients who receive the interacting drugs.

Pharmacokinetic interactions occur when one drug increases or reduces the amount of another drug available to produce its pharmacological action. They are not easily predicted and an interaction occurring with one drug cannot be assumed to occur with a related drug unless their pharmacokinetic properties are similar. Pharmacokinetic interactions may be due to:

• interference with absorption,
• changes in protein binding,
• modification of drug metabolism,
• interference with renal excretion.

Many pharmacokinetic interactions affect only a small proportion of patients taking a combination of interacting drugs.

Many drug interactions do not have serious consequences and many which are potentially harmful occur only in a small proportion of patients. A known interaction will not necessarily occur to the same extent in all patients. Drugs with a small therapeutic to toxic ratio (such as phenytoin) and drugs which require careful dose control (such as anticoagulants, antihypertensives, or antidiabetics) are most often involved.

Patients at increased risk from drug interactions include theelderly and those with impaired renal or liver function.

interaction and the combined administration of the drugs involved should be avoided, or only taken with caution and appropriate monitoring.

**Absence of a medicine from the list does not imply the medicine not interaction**

# Interaction:

**Acetylsalicylic acid**

Acetazolamide
increased risk of toxicity when given with high-dose acetylsalicylic acid
antacids (Aluminium hydroxide; Magnesium hydroxide) Excretion of acetylsalicylic acid increased by alkaline urine Increased risk of gastrointestinal bleeding and ulceration Dexamethasone
dexamethasone
reduces plasma salicylate concentration
Enalapril
Antagonism of hypotensive effect; risk renal impairment
when acetylsalicylic acid given in doses of over 300 mg daily.
Fluoxetine
Increased risk of bleeding
Heparin
Enhanced anticoagulant effect of heparin
Hydrocortisone
Increased risk of gastrointestinal bleeding and ulceration; hydrocortisone reduces plasma salicylate concentration
Ibuprofen
Avoid concomitant use (increased adverse effects) antiplatelet effect of acetylsalicylic acid possibly reduced
Methotrexate
Reduced excretion of methotrexate (increased toxicity)
Metoclopramide
Metoclopramide Enhanced effect of acetylsalicylic acid (increased rate of absorption)
Mifepristone
Manufacturer of mifepristone advises avoid concomitant
use
Phenytoin
Enhancement of effect of phenytoin
Prednisolone
Increased risk of gastrointestinal bleeding and ulceration prednisolone reduces plasma salicylate concentration
Spironolactone
Antagonism of diuretic effect
Valproic acid
Enhancement of effect of valproic acid
Warfarin
Increased risk of bleeding due to antiplatelet effect

**Aciclovir**

Ciclosporin
Increased risk of nephrotoxicity

**Albendazole**

Dexamethasone
Plasma albendazole concentration possibly increased
Praziquantel
Increased plasma concentration of active metabolite of albendazole

**Amikacin**

Alcuronium
Enhanced effects of alcuronium
Amphotericin B
Increased risk of nephrotoxicity
Capreomycin
Increased risk of nephrotoxicity and ototoxicity
Ciclosporin
Increased risk of nephrotoxicity
Cisplatin
Increased risk of nephrotoxicity and possibly ototoxicity
Furosemide
Increased risk of ototoxicity
Neostigmine
Antagonism of effects of neostigmine
Pyridostigmine
Antagonism of effects of pyridostigmine
Suxamethonium
Enhanced effects of suxamethonium
Vancomycin
Increased risk of nephrotoxicity and ototoxicity
Vecuronium
Enhanced effects of vecuronium

**Amlodipine**

Acetazolamide
Enhanced hypotensive effect
Alcohol
Enhanced hypotensive effect
Amiloride
Enhanced hypotensive effect
Atenolol
Enhanced hypotensive effect
Carbamazepine
Probably reduced effect of amlodipine
Chlorpromazine
Enhanced hypotensive effect
Contraceptives
Oral Antagonism of hypotensive effect by estrogens
Dexamethasone
Antagonism of hypotensive effect
Diazepam
Enhanced hypotensive effect
Enalapril
Enhanced hypotensive effect
Fluphenazine
Enhanced hypotensive effect
Furosemide
Enhanced hypotensive effect
Glyceryl trinitrate
Enhanced hypotensive effect
Haloperidol
Enhanced hypotensive effect
Halothane
Enhanced hypotensive effect
Hydralazine
Enhanced hypotensive effect
Hydrochlorothiazide
Enhanced hypotensive effect
Hydrocortisone
Antagonism of hypotensive effect
Ibuprofen
Antagonism of hypotensive effect
Isosorbide dinitrate
Enhanced hypotensive effect

Ketamine
Enhanced hypotensive effect
Levodopa
Enhanced hypotensive effect
Mefloquine
Possible increased risk of bradycardia
Methyldopa
Enhanced hypotensive effect
Nitrous oxide
Enhanced hypotensive effect
Phenobarbital
Probably reduced effect of amlodipine
Phenytoin
Probably reduced effect of amlodipine
Prednisolone
Antagonism of hypotensive effect
Propranolol
Enhanced hypotensive effect
Possibly increased plasma concentration of amlodipine Sodium nitroprusside
Enhanced hypotensive effect
Spironolactone
Enhanced hypotensive effect
Thiopental
Enhanced hypotensive effect
Timolol
Enhanced hypotensive effect
Ritonavir

**Amoxicillin**
**Amoxicillin + clavulanic acid**

Allopurinol
Increased risk of rash
Contraceptives
Oral Contraceptive effect of estrogens possibly reduced (risk probably small)
Methotrexate
Reduced excretion of methotrexate (increased risk of toxicity)
Warfarin
Studies have failed to demonstrate an interaction, but common experience in anticoagulant clinics is that INR can be altered by a course of amoxicillin

**Amphotericin B**

Amikacin
Increased risk of nephrotoxicity
Ciclosporin
Increased risk of nephrotoxicity
Dexamethasone
Increased risk of hypokalaemia (avoid concomitant use unless dexamethasone needed to control reactions)
Digoxin
Hypokalaemia by amphotericin B increases cardiac toxicity of digoxin
Fluconazole
Possible antagonism of effect of amphotericin B
Flucytosine
Renal excretion of flucytosine decreased and cellular uptake increased (flucytosine toxicity possibly increased)
Furosemide
Increased risk of hypokalaemia
Gentamicin
Increased risk of nephrotoxicity
Hydrochlorothiazide
Increased risk of hypokalaemia
Hydrocortisone
Increased risk of hypokalaemia (avoid concomitant use unless hydrocortisone needed to control reactions)
Miconazole

Possibly antagonism of effects of amphotericin B
Paromomycin
Possibly increased risk of nephrotoxicity
Pentamidine
Possibly increased risk of nephrotoxicity
Prednisolone
Increased risk of hypokalaemia (avoid concomitant use unless prednisolone needed to control reactions)
Streptomycin
Increased risk of nephrotoxicity
Vancomycin
Possibly increased risk of nephrotoxicity

**Ampicillin**

Allopurinol
Increased risk of rash
Contraceptives
Oral Contraceptive effect of estrogens possibly reduced (risk probably small)
Methotrexate
Reduced excretion of methotrexate (increased risk of toxicity)
Warfarin
Studies have failed to demonstrate an interaction, but common experience in anticoagulant clinics is that INR can be altered by a course of ampicillin

**Antacids (Aluminium hydroxide; Magnesium hydroxide)**

Acetylsalicylic acid
Excretion of acetylsalicylic acid increased by alkaline urine
Azithromycin
Reduced absorption of azithromycin
Chloroquine
Reduced absorption of chloroquine
Chlorpromazine
Reduced absorption of chlorpromazine
Ciprofloxacin
Reduced absorption of ciprofloxacin
Digoxin
Possibly reduced absorption of digoxin
Doxycycline
Reduced absorption of doxycycline
Enalapril
Absorption of enalapril reduced
Fluphenazine
Reduced absorption of fluphenazine
Isoniazid
Reduced absorption of isoniazid
Levofloxacin
Reduced absorption of levofloxacin
Ofloxacin
Reduced absorption of ofloxacin
Penicillamine
Reduced absorption of penicillamine
Phenytoin
Reduced absorption of phenytoin
Quinidine
Reduced quinidine excretion in alkaline urine (plasma quinidine concentration occasionally increased)
Rifampicin
Reduced absorption of rifampicin

**Artemether + lumefantrine**

Amitriptyline
Manufacturer of artemether + lumefantrine advises avoid concomitant use
Azithromycin

Manufacturer of artemether + lumefantrine advises avoid concomitant use

Chloroquine
Manufacturer of artemether + lumefantrine advises avoid concomitant use

Chlorpromazine
Manufacturer of artemether + lumefantrine advises avoid concomitant use

Ciprofloxacin
Manufacturer of artemether + lumefantrine advises avoid concomitant use

Clomipramine
Manufacturer of artemether + lumefantrine advises avoid concomitant use

Erythromycin
Manufacturer of artemether + lumefantrine advises avoid concomitant use

Fluconazole
Manufacturer of artemether + lumefantrine advises avoid concomitant use

Fluoxetine
Manufacturer of artemether + lumefantrine advises avoid concomitant use

Fluphenazine
Manufacturer of artemether + lumefantrine advises avoid concomitant use

Haloperidol
Manufacturer of artemether + lumefantrine advises avoid concomitant use

Indinavir
Manufacturer of artemether + lumefantrine advises avoid concomitant use

Levofloxacin
Manufacturer of artemether + lumefantrine advises avoid concomitant use

Lopinavir
Manufacturer of artemether + lumefantrine advises avoid concomitant use

Mefloquine
Manufacturer of artemether + lumefantrine advises avoid concomitant use

Nelfinavir
Manufacturer of artemether + lumefantrine advises avoid concomitant use

Ofloxacin
Manufacturer of artemether + lumefantrine advises avoid concomitant use

Primaquine
Manufacturer of artemether + lumefantrine advises avoid concomitant use

Procainamide
Risk of ventricular arrhythmias; manufacturer of artemether + lumefantrine advises avoid concomitant use

Proguanil
Manufacturer of artemether + lumefantrine advises avoid concomitant use

Pyrimethamine
Manufacturer of artemether + lumefantrine advises avoid concomitant use

Quinidine
Risk ventricular arrhythmias; manufacturer of artemether + lumefantrine advises avoid concomitant use

Quinine
Risk ventricular arrhythmias; manufacturer of artemether + lumefantrine advises avoid concomitant use

Ritonavir
Manufacturer of artemether + lumefantrine advises avoid concomitant use
Saquinavir
Manufacturer of artemether + lumefantrine advises avoid concomitant use
Sulfadoxine + pyrimethamine
Manufacturer of artemether + lumefantrine advises avoid concomitant use

**Atenolol**

Acetazolamide
Enhanced hypotensive effect
Alcohol
Enhanced hypotensive effect
Amiloride
Enhanced hypotensive effect
Amlodipine
Enhanced hypotensive effect
Chlorpromazine
Enhanced hypotensive effect
Contraceptives
Oral Antagonism of hypotensive effect by estrogens
Dexamethasone
Antagonism of hypotensive effect
Diazepam
Enhanced hypotensive effect
Digoxin
Increased risk of AV block and bradycardia
Enalapril
Enhanced hypotensive effect
Epinephrine
Severe hypertension
Fluphenazine
Enhanced hypotensive effect
Furosemide
Enhanced hypotensive effect
Glibenclamide
Atenolol may mask warning signs of hypoglycaemia such as tremor
Glyceryl trinitrate
Enhanced hypotensive effect
Halothane
Enhanced hypotensive effect
Hydralazine
Enhanced hypotensive effect
Hydrochlorothiazide
Enhanced hypotensive effect
Hydrocortisone
Antagonism of hypotensive effect
Ibuprofen
Antagonism of hypotensive effect
Insulins
Enhanced hypoglycaemic effect; atenolol may mask warning signs of hypoglycaemia such as tremor
Isosorbide dinitrate
Enhanced hypotensive effect
Ketamine
Enhanced hypotensive effect
Levodopa
Enhanced hypotensive effect
Lidocaine
Increased myocardial depression (interaction less likely when lidocaine used topically)
Mefloquine
Increased risk of bradycardia

Metformin
Atenolol may mask warning signs of hypoglycaemia such as tremor
Methyldopa
Enhanced hypotensive effect
Nifedipine
Enhanced hypotensive effect; possibly severe hypotension and heart failure
Nitrous oxide
Enhanced hypotensive effect
Pilocarpine
Increased risk of arrhythmias
Prednisolone
Antagonism of hypotensive effect
Procainamide
Increased myocardial depression
Quinidine
Increased myocardial depression
Sodium nitroprusside
Enhanced hypotensive effect
Spironolactone
Enhanced hypotensive effect
Thiopental
Enhanced hypotensive effect
Verapamil
Asystole, severe hypotension and heart failure

**Atropine**

Amitriptyline
Increased antimuscarinic adverse effects
Chlorphenamine
Increased antimuscarinic adverse effects
Chlorpromazine
Increased antimuscarinic adverse effects (but reduced plasma chlorpromazine concentration)
Clomipramine
Increased antimuscarinic adverse effects
Fluphenazine
Increased antimuscarinic adverse effects (but reduced plasma fluphenazine concentration)
Glyceryl trinitrate
Possibly reduced effect of sublingual glyceryl trinitrate tablets (failure to dissolve under the tongue owing to dry mouth)
Haloperidol
Possibly reduced effects of haloperidol
Isosorbide dinitrate
Possibly reduced effect of sublingual isosorbide dinitrate tablets (failure to dissolve under the tongue owing to dry mouth)
Levodopa
Absorption of levodopa possibly reduced
Metoclopramide Antagonism of effects of metoclopramide on gastrointestinal activity
Neostigmine
Antagonism of effects of neostigmine
Pilocarpine
Antagonism of effects of pilocarpine
Promethazine
Increased risk of antimuscarinic adverse effects
Pyridostigmine
Antagonism of effects of pyridostigmine

**Azithromycin**

Antacids (Aluminium hydroxide; Magnesium hydroxide)
Reduced absorption of azithromycin
Artemether + lumefantrine
Manufacturer of artemether + lumefantrine advises avoid concomitant use

Ciclosporin
Possible inhibition of metabolism ciclosporin (increased plasma concentration)
Contraceptives
Oral Contraceptive effect of estrogens possibly reduced (risk probably small)
Digoxin
Increased plasma concentration of digoxin (increased risk of toxicity)
Ritonavir
Plasma concentration of azithromycin possibly increased
Warfarin
Possibly enhanced anticoagulant effect of warfarin

**Benzathine benzylpenicillin**
**Benzylpenicillin**

Contraceptives
Oral Contraceptive effect of estrogens possibly reduced (risk probably small)
Methotrexate
Reduced excretion of methotrexate (increased risk of toxicity)

**Bupivacaine**

Lidocaine
Increased myocardial depression (interaction less likely when lidocaine used topically)
Procainamide
Increased myocardial depression
Propranolol
Increased risk of bupivacaine toxicity
Quinidine
Increased myocardial depression

**Capreomycin**

Amikacin
Increased risk of nephrotoxicity and ototoxicity
Gentamicin
Increased risk of nephrotoxicity and ototoxicity
Streptomycin
Increased risk of nephrotoxicity and ototoxicity
Vancomycin
Increased risk of nephrotoxicity and ototoxicity

**Carbamazepine**

Acetazolamide
Increased risk of hyponatraemia; acetazolamide increases plasma carbamazepine concentration
Alcohol
Possibly enhanced CNS adverse effects of carbamazepine
Alcuronium Antagonism of muscle relaxant effect (recovery from neuromuscular blockade accelerated)
Amiloride
Increased risk of hyponatraemia
Amitriptyline
Antagonism anticonvulsant effect (convulsive threshold lowered); accelerated metabolism of amitriptyline (reduced plasma concentration; reduced antidepressant effect)
Amlodipine
Probably reduced effect of amlodipine
Chloroquine
Possibly increased risk of convulsions
Chlorpromazine
Antagonism anticonvulsant effect (convulsive threshold lowered)
Ciclosporin
Accelerated metabolism of ciclosporin (reduced plasma ciclosporin concentration)
Clomipramine
Antagonism anticonvulsant effect (convulsive threshold lowered); accelerated metabolism of clomipramine (reduced plasma concentration; reduced antidepressant

effect)
Contraceptives
Oral Accelerated metabolism estrogens and progestogens (reduced contraceptive effect)
Dexamethasone
Accelerated metabolism of dexamethasone (reduced effect)
Doxycycline
Accelerated metabolism of doxycycline (reduced effect )
Ergocalciferol
Ergocalciferol requirements possibly increased
Erythromycin
Increased plasma carbamazepine concentration
Ethosuximide
May be enhanced toxicity without corresponding increase in antiepileptic effect; plasma concentration of ethosuximide
Possibly reduced fluoxetine Plasma concentration of carbamazepine increased
Fluphenazine
Antagonism anticonvulsant effect (convulsive threshold lowered)
Furosemide
Increased risk of hyponatraemia
Haloperidol
Antagonism of anticonvulsant effect (convulsive threshold lowered); metabolism of haloperidol accelerated (reduced plasma concentration)
Hydrochlorothiazide
Increased risk of hyponatraemia
Hydrocortisone
Accelerated metabolism of hydrocortisone (reduced effect)
Indinavir
Possibly reduced plasma indinavir concentration
Isoniazid
Increased plasma carbamazepine concentration (also isoniazid hepatotoxicity possibly increased)
Levonorgestrel
Accelerated metabolism of levonorgestrel (reduced contraceptive effect)
Levothyroxine
Accelerated metabolism of levothyroxine (may increase levothyroxine requirements in hypothyroidism)
Lithium
Neurotoxicity may occur without increased plasma lithium concentration
Lopinavir
Possibly reduced plasma lopinavir concentration
Mebendazole
Reduced plasma mebendazole concentration (possibly increase mebendazole dose in tissue infection)
Medroxyprogesterone
Accelerated metabolism of medroxyprogesterone (does not apply to injectable medroxyprogesterone acetate used for contraception)
Mefloquine
Antagonism of anticonvulsant effect
Methadone
Reduced plasma concentration of methadone
Miconazole
Plasma concentration carbamazepine possibly increased
Nelfinavir
Possibly reduced plasma nelfinavir concentration
Nifedipine
Probably reduced effect of nifedipine
Norethisterone
Accelerated metabolism of norethisterone (reduced
Vecuronium
Antagonism of muscle relaxant effect (recovery from neuromuscular blockade accelerated)

Verapamil
Enhanced effect of carbamazepine
Warfarin
Accelerated metabolism warfarin (reduced anticoagulant effect)

**Cefixime**

Contraceptives
Oral Contraceptive effect of estrogens possibly reduced (risk probably small)
Warfarin
Possibly enhanced anticoagulant effect

**Ceftriaxone**

Contraceptives
Oral Contraceptive effect of estrogens possibly reduced (risk probably small)
Warfarin
Possibly enhanced anticoagulant effect

**Chlorambucil**

Phenytoin
Possibly reduced absorption of phenytoin
Vaccine
Live Avoid use of live vaccines with chlorambucil (impairment of immune response)

**Chloramphenicol**

Ciclosporin
Plasma concentration of ciclosporin possibly increased
Glibenclamide
Enhanced effect of glibenclamide
Hydroxocobalamin
Response to hydroxocobalamin reduced
Phenobarbital
Metabolism of chloramphenicol accelerated (reduced plasma chloramphenicol concentration)
Phenytoin
Plasma phenytoin concentration increased (increased risk of toxicity)
Rifampicin
Accelerated metabolism of chloramphenicol (reduced plasma chloramphenicol concentration)
Warfarin
Enhanced anticoagulant effect

**Chloroquine**

Antacids (Aluminium hydroxide; Magnesium hydroxide)
Reduced absorption of chloroquine
Artemether + lumefantrine
Manufacturer of artemether + lumefantrine advises avoid concomitant use
Carbamazepine
Possibly increased risk of convulsions
Ciclosporin
Increased plasma ciclosporin concentration (increased risk of toxicity)
Digoxin
Plasma digoxin concentration possibly increased
Phenytoin
Possible increased risk of convulsions
Praziquantel
Plasma praziquantel concentration possibly reduced
Pyridostigmine
Chloroquine has potential to increase symptoms of myasthenia gravis and thus diminish effect of pyridostigmine
Quinidine
Increased risk of ventricular arrhythmias
Quinine
Increased risk of ventricular arrhythmias
Valproic acid
Possibly increased risk of convulsions

**Chlorphenamine**

Alcohol

Enhanced sedative effect
Amitriptyline
Increased antimuscarinic and sedative effects
Clomipramine
Increased antimuscarinic and sedative effects
Diazepam
Enhanced sedative effect

**Chlorpromazine**

Acetazolamide
Enhanced hypotensive effect
Alcohol
Enhanced sedative effect
Amlodipine
Enhanced hypotensive effect
Artemether + lumefantrine
Manufacturer of artemether + lumefantrine advises avoid concomitant use
Atenolol
Enhanced hypotensive effect
Atropine
Increased antimuscarinic adverse effects (but reduced plasma chlorpromazine concentration)
Clomipramine
Increased antimuscarinic adverse effects; increased plasma clomipramine concentration; possibly increased risk of ventricular arrhythmias
Epinephrine
Antagonism of hypertensive effect
Furosemide
Enhanced hypotensive effect
Glibenclamide
Possible antagonism of hypoglycaemic effect
Glyceryl trinitrate
Enhanced hypotensive effect
Halothane
Enhanced hypotensive effect
Hydralazine
Enhanced hypotensive effect
Hydrochlorothiazide
Enhanced hypotensive effect
Isosorbide dinitrate
Enhanced hypotensive effect
Quinidine
Increased risk of ventricular arrhythmias
Ritonavir Plasma concentration possibly increased by ritonavir
Sodium nitroprusside
Enhanced hypotensive effect
Spironolactone
Enhanced hypotensive effect
Thiopental
Enhanced hypotensive effect
Timolol
Enhanced hypotensive effect
Valproic acid
Antagonism of anticonvulsant effect (convulsive threshold lowered) Verapamil Enhanced hypotensive effect

**Ciclosporin**

Aciclovir
Increased risk of nephrotoxicity
Allopurinol
Plasma ciclosporin concentration possibly increased (risk of nephrotoxicity)
Amikacin
Increased risk of nephrotoxicity
Ciprofloxacin

Increased risk of nephrotoxicity
Contraceptives
Oral Plasma ciclosporin concentration increased by progestogens and possibly increased by estrogens
Digoxin
Increased plasma concentration of digoxin (increased risk of toxicity)
Doxorubicin
Increased risk of neurotoxicity
Doxycycline
Possibly increased plasma ciclosporin concentration
Enalapril
Increased risk of hyperkalaemia
Erythromycin
Increased plasma ciclosporin concentration (inhibition of metabolism of ciclosporin)
Etoposide
Possibly increased plasma concentration of etoposide (increased risk of toxicity)
Griseofulvin
Plasma ciclosporin concentration possibly reduced
Hydrochlorothiazide
Increased risk of nephrotoxicity and possibly hypermagnesaemia
Ibuprofen
Increased risk of nephrotoxicity
Potassium salts
Increased risk of hyperkalaemia
Prednisolone
Increased plasma concentration of prednisolone
Rifampicin
Accelerated metabolism of ciclosporin (reduced plasma ciclosporin concentration)
Streptomycin
Increased risk of nephrotoxicity
Sulfadiazine
Plasma ciclosporin concentration possibly reduced; increased risk of nephrotoxicity
Sulfadoxine + pyrimethamine
Increased risk of nephrotoxicity
Sulfamethoxazole + trimethoprim
Increased risk of nephrotoxicity; plasma ciclosporin concentration possibly reduced by intravenous trimethoprim
Trimethoprim Increased risk of nephrotoxicity; plasma ciclosporin concentration possibly reduced by intravenous trimethoprim
Vaccine
Live Avoid use of live vaccines with ciclosporin (impairment of immune response)
Vancomycin
Increased risk of nephrotoxicity
Verapamil
Increased plasma ciclosporin concentration

**Ciprofloxacin**

Antacids (Aluminium hydroxide; Magnesium hydroxide)
Reduced absorption of ciprofloxacin
Artemether + Lumefantrine
Manufacturer of artemether + lumefantrine advises avoid concomitant use
Phenytoin
Plasma phenytoin concentration can be increased or decreased by ciprofloxacin
Warfarin
Enhanced anticoagulant effect
Zinc sulfate
Reduced absorption of ciprofloxacin

**Cisplatin**

Acetazolamide
Increased risk of nephrotoxicity and ototoxicity
Amikacin
Increased risk nephrotoxicity and possibly of ototoxicity
Gentamicin
Increased risk of nephrotoxicity and possibly of ototoxicity
Hydrochlorothiazide
Increased risk of nephrotoxicity and ototoxicity
Methotrexate
Risk of pulmonary toxicity Paromomycin Increased risk of ototoxicity
Phenytoin
Reduced absorption of phenytoin Spironolactone Increased risk of nephrotoxicity and ototoxicity
Streptomycin
Increased risk of nephrotoxicity and possibly of ototoxicity
Vaccine
Live Avoid use of live vaccines with cisplatin (impairment ofimmune response)
Vancomycin Increased risk of nephrotoxicity and possibly of ototoxicity

**Clindamycin**

Alcuronium
Enhanced muscle relaxant effect
Neostigmine
Antagonism of effects of neostigmine
Pyridostigmine
Antagonism of effects of pyridostigmine
Suxamethonium
Enhanced effects of suxamethonium
Vecuronium
Enhanced muscle relaxant effect

**Clomipramine**

Acetazolamide
Increased risk of postural hypotension
Alcohol
Enhanced sedative effect
Artemether + lumefantrine
Manufacturer of artemether + lumefantrine advises avoid concomitant use
Atropine
Increased antimuscarinic adverse effects
Lithium
Risk of toxicity
Methadone
Sedative effects possibly increased
Morphine
Possibly increased sedation
Quinidine
Increased risk of ventricular arrhythmias
Rifampicin
Plasma concentration of clomipramine possibly reduced
Valproic acid
Antagonism of anticonvulsant effect (convulsive threshold lowered)
Verapamil
Possibly increased plasma concentration of clomipramine
Warfarin
Enhanced or reduced anticoagulant effect

**Cytarabine**

Flucytosine
Plasma flucytosine concentration possibly reduced
Phenytoin
Reduced absorption of phenytoin
Vaccine
Live Avoid use of live vaccines with cytarabine (impairment of immune response)

**Dacarbazine**

Phenytoin

Possibly reduced absorption of phenytoin
Vaccine
Live Avoid use of live vaccines with dacarbazine (impairment of immune response)

**Dactinomycin**

Phenytoin
Possibly reduced absorption of phenytoin
Vaccine
Live Avoid use of live vaccines with dacarbazine (impairment of immune response)

**Daunorubicin**

Phenytoin
Possibly reduced absorption of phenytoin
Vaccine
Live Avoid use of live vaccines with dacarbazine (impairment of immune response)

**Dexamethasone**

Acetazolamide
Increased risk of hypokalaemia; antagonism of diuretic effect
Acetylsalicylic acid
Increased risk of gastrointestinal bleeding and ulceration; dexamethasone reduces plasma salicylate concentration
Albendazole
Plasma albendazole concentration possibly increased
Glibenclamide
Antagonism of hypoglycaemic effect
Metformin
Antagonism of hypoglycaemic effect
Methotrexate
Increased risk of haematological toxicity
Methyldopa
Antagonism of hypotensive effect
Praziquantel
Plasma praziquantel concentration reduced
Propranolol
Antagonism of hypotensive effect
Rifampicin
Accelerated metabolism of dexamethasone (reduced effect)
Warfarin
Anticoagulant effect possibly enhanced or reduced (highdose dexamethasone enhances anticoagulant effect)

**Diazepam**

Acetazolamide
Enhanced hypotensive effect
Alcohol
Enhanced sedative effect
Amiloride
Enhanced hypotensive effect
Amitriptyline
Enhanced sedative effect
Amlodipine
Enhanced hypotensive effect
Atenolol
Enhanced hypotensive effect
Chlorphenamine
Enhanced sedative effect
Chlorpromazine
Enhanced sedative effect
Clomipramine
Enhanced sedative effect
Codeine
Enhanced sedative effect
Enalapril
Enhanced hypotensive effect
Fluphenazine

Enhanced sedative effect
Furosemide
Enhanced hypotensive effect
Glyceryl trinitrate
Enhanced hypotensive effect
Haloperidol
Enhanced sedative effect
Halothane
Enhanced sedative effect
Hydralazine
Enhanced hypotensive effect
Hydrochlorothiazide
Enhanced hypotensive effect
Promethazine
Enhanced sedative effect
Propranolol
Enhanced hypotensive effect
Rifampicin
Spironolactone
Enhanced hypotensive effect
Thiopental
Enhanced sedative effect
Timolol
Enhanced hypotensive effect
Verapamil
Enhanced hypotensive effect

**Digoxin**

Acetazolamide
Hypokalaemia caused by acetazolamide increases cardiac toxicity of digoxin
Amphotericin B
Hypokalaemia caused by amphotericin B increases cardiac toxicity of digoxin
Erythromycin
Increased plasma concentration of digoxin (increased risk of toxicity)
Furosemide
Hypokalaemia caused by furosemide increases cardiac toxicity of digoxin
Gentamicin
Possibly increased plasma concentration of digoxin
Phenytoin
Plasma concentration of digoxin possibly reduced
Prednisolone
Increased risk of hypokalaemia
Propranolol
Increased risk of AV block and bradycardia
Quinidine
Plasma concentration of digoxin increased (halve dose of digoxin)
Quinine
Plasma concentration of digoxin increased

**Dopamine**

Chlorpromazine
Antagonism of hypertensive effect
Ergometrine
Increased risk of ergotism
Fluphenazine Antagonism of hypertensive effect
Haloperidol
Antagonism of hypertensive effect

**Doxorubicin**

Ciclosporin
Increased risk of neurotoxicity
Phenytoin
Possibly reduced absorption of phenytoin

**Doxycycline**

Antacids (Aluminium hydroxide; Magnesium hydroxide)
Reduced absorption of doxycycline
Carbamazepine
Accelerated metabolism of doxycycline (reduced effect)
Ciclosporin
Possibly increased plasma ciclosporin concentration
Contraceptives
Oral Contraceptive effect of estrogens possibly reduced (risk probably small)
Ferrous salts
Absorption of oral ferrous salts reduced by doxycycline; absorption of doxycycline reduced by oral ferrous salts
Methotrexate
Increased risk of methotrexate toxicity

**Epinephrine**

Amitriptyline
Increased risk of hypertension and arrhythmias (but local anaesthetics which contain epinephrine appear to be safe)
Atenolol
Severe hypertension
Chlorpromazine
Antagonism of hypertensive effect
Propranolol
Severe hypertension
Timolol
Severe hypertension

**Ergometrine**

Dopamine
Increased risk of ergotism
Halothane
Reduced effect of ergometrine on parturient uterus

**Erythromycin**

Artemether + lumefantrine
Manufacturer of artemether + lumefantrine advises avoid concomitant use
Carbamazepine
Increased plasma carbamazepine concentration
Ciclosporin
Increased plasma ciclosporin concentration (inhibition of metabolism of ciclosporin)
Quinidine
Increased risk of ventricular arrhythmias with parenteral erythromycin
Valproic acid
Metabolism of valproic acid possibly inhibited (increased plasma concentration)
Verapamil
Possible inhibition of metabolism of verapamil (increased risk of toxicity)
Vinblastine
Increased toxicity of vinblastine (avoid concomitant use)
Warfarin
Enhanced anticoagulant effect

**Etoposide**

Ciclosporin
Possibly increased plasma concentration of etoposide (increased risk of toxicity)
Phenobarbital
Possibly reduced plasma concentration of etoposide
Phenytoin
Possibly reduced absorption of phenytoin and possibly reduced plasma concentration of etoposide

Vaccine
Live Avoid use of live vaccines with etoposide (impairment of immune response)
Warfarin
Possibly enhanced anticoagulant effect

**Ferrous salts**

Calcium salts
Reduced absorption of oral ferrous salts
Ciprofloxacin
Absorption of ciprofloxacin reduced by oral ferrous salts
Dimercaprol
Avoid concomitant use
Doxycycline
Absorption of oral ferrous salts reduced by doxycycline; absorption of doxycycline reduced by oral ferrous salts
Levodopa
Absorption of levodopa may be reduced by oral ferrous salts

**Fluorouracil**

Metronidazole
Metabolism of fluorouracil inhibited (increased toxicity)
Phenytoin
Metabolism of phenytoin possibly inhibited (increased risk of toxicity)
Vaccine
Live Avoid use of live vaccines with fluorouracil (impairment of immune response)
Warfarin
Anticoagulant effect possibly enhanced

**Fluphenazine**

Acetazolamide
Enhanced hypotensive effect
Alcohol
Enhanced sedative effect
Amiloride
Enhanced hypotensive effect
Methadone
Enhanced hypotensive and sedative effects
Methyldopa
Enhanced hypotensive effect; increased risk of extrapyramidal effects
Metoclopramide
Increased risk of extrapyramidal effects
Morphine
Enhanced sedative and hypotensive effect
Nifedipine
Enhanced hypotensive effect
Propranolol
Enhanced hypotensive effect
Quinidine
Increased risk of ventricular arrhythmias
Thiopental
Enhanced hypotensive effect
Timolol
Enhanced hypotensive effect
Verapamil
Enhanced hypotensive effect

**Furosemide**

Acetazolamide
Increased risk of hypokalaemia
Alcohol
Enhanced hypotensive effect
Amikacin
Increased risk of ototoxicity
Amitriptyline
Increased risk of postural hypotension
Amlodipine
Enhanced hypotensive effect

Amphotericin B
Increased risk of hypokalaemia
Digoxin
Hypokalaemia caused by furosemide increases cardiac toxicity of digoxin
Fluphenazine
Enhanced hypotensive effect
Gentamicin
Increased risk of ototoxicity
Glibenclamide
Antagonism of hypoglycaemic effect
Halothane
Enhanced hypotensive effect
Hydralazine
Enhanced hypotensive effect
Metformin
Antagonism of hypoglycaemic effect
Methyldopa
Enhanced hypotensive effect
Nifedipine
Enhanced hypotensive effect
Thiopental
Enhanced hypotensive effect
Timolol
Enhanced hypotensive effect
Vancomycin
Increased risk of ototoxicity
Verapamil
Enhanced hypotensive effect

**Gentamicin**

Alcuronium
Enhanced muscle relaxant effect
Amphotericin B
Increased risk of nephrotoxicity
Vancomycin
Increased risk of nephrotoxicity and ototoxicity
Vecuronium
Enhanced muscle relaxant effect

**Glibenclamide**

Alcohol
Enhanced hypoglycaemic effect
Warfarin
Possibly enhanced hypoglycaemic effect and changes to anticoagulant effect

**Haloperidol**

Alcohol
Enhanced sedative effect
Amitriptyline
Increased plasma amitriptyline concentration; possibly increased risk of ventricular arrhythmias
Amlodipine
Enhanced hypotensive effect
Artemether +lumefantrine
Manufacturer of artemether + lumefantrine advises avoid concomitant use
Valproic acid
Antagonism of anticonvulsant effect convulsive threshold lowered
Verapamil
Enhanced hypotensive effect

**Halothane**

Acetazolamide
Enhanced hypotensive effect
Alcuronium
Effects of alcuronium enhanced
Amiloride

Enhanced hypotensive effect
Methyldopa
Enhanced hypotensive effect
Propranolol
Enhanced hypotensive effect
Sodium nitroprusside
Enhanced hypotensive effect
Spironolactone
Enhanced hypotensive effect
Suxamethonium
Enhanced effects of suxamethonium

**Heparin**

Acetylsalicylic acid
Enhanced anticoagulant effect of heparin
Enalapril
Increased risk of hyperkalaemia
Glyceryl trinitrate
Anticoagulant effect reduced by infusion of glyceryl trinitrate
Ibuprofen
Possibly increased risk of bleeding

**Hydralazine**

Acetazolamide
Enhanced hypotensive effect
Alcohol
Enhanced hypotensive effect
Amiloride
Enhanced hypotensive effect
Amlodipine
Enhanced hypotensive effect
Atenolol
Enhanced hypotensive effect
Spironolactone
Enhanced hypotensive effect
Thiopental
Enhanced hypotensive effect
Timolol
Enhanced hypotensive effect
Verapamil
Enhanced hypotensive effect

**Hydrocortisone**

Acetazolamide
Increased risk of hypokalaemia; antagonism of diuretic effect
Furosemide
Antagonism of diuretic effect; increased risk of hypokalaemia
Glibenclamide
Antagonism of hypoglycaemic effect
Verapamil
Antagonism of hypotensive effect
Warfarin
Anticoagulant effect possibly enhanced or reduced (highdose hydrocortisone enhances anticoagulant effect)

**Neostigmine**

Alcuronium
Antagonism of muscle relaxant effect
Amikacin
Antagonism of effect of neostigmine
Atropine
Antagonism of effect of neostigmine
Suxamethonium
Effect of suxamethonium enhanced
Vecuronium
Antagonism of muscle relaxant effect

**Oxytocin**

Ephedrine
Risk of hypertension due to enhanced vasopressor effect of ephedrine
Epinephrine
Risk of hypertension due to enhanced vasopressor effect of epinephrine
Halothane
Oxytocic effect possibly reduced; enhanced hypotensive effect and risk of arrhythmias

**Paracetamol**

Metoclopramide
Increased absorption of paracetamol
Warfarin
Prolonged regular use of paracetamol possibly enhances anticoagulant effect

**Phenobarbital**

Acetazolamide
Increased risk of osteomalacia
Alcohol
Enhanced sedative effect
Doxycycline
Metabolism of doxycycline accelerated (reduced plasma concentration)
Ergocalciferol
Ergocalciferol requirements possibly increased
Quinidine
Metabolism of quinidine accelerated (reduced plasma concentration)
Verapamil
Effect of verapamil probably reduced
Warfarin
Metabolism of warfarin accelerated (reduced anticoagulant effect)

**Phenytoin**

Acetazolamide
Increased risk of osteomalacia
Acetylsalicylic acid
Enhancement of effect of phenytoin
Alcohol
Plasma phenytoin concentration reduced with regular largeamounts of alcohol
Chloroquine
Possibly increased risk of convulsions
Chlorpromazine
Antagonism of anticonvulsant effect (convulsive threshold lowered)
Ciclosporin
Accelerated metabolism of ciclosporin (reduced plasma ciclosporin concentration)
Ciprofloxacin
Plasma phenytoin concentration can be increased or decreased by ciprofloxacin
Cytarabine
Reduced absorption of phenytoin
Dacarbazine
Possibly reduced absorption of phenytoin
Haloperidol
Antagonism of anticonvulsant effect (convulsive threshold lowered)
Hydrocortisone
Metabolism of hydrocortisone accelerated (reduced effect)
Quinidine
Accelerated metabolism of quinidine (reduced plasma quinidine concentration)
Rifampicin
Accelerated metabolism of phenytoin (reduced plasma concentration)
Vaccine
Influenza Enhanced effect of phenytoin
Valproic acid
May be enhanced toxicity without corresponding increase in antiepileptic effect; plasma concentration of valproic acid reduced; plasma concentration of phenytoin increased or possibly reduced
Vecuronium

Antagonism of muscle relaxant effect (accelerated recovery from neuromuscular blockade)

**Praziquantel**

Albendazole
Increased plasma concentration of active metabolite of albendazole
Carbamazepine
Plasma praziquantel concentration reduced
Chloroquine
Plasma praziquantel concentration possibly reduced
Dexamethasone
Plasma praziquantel concentration reduced
Phenytoin
Plasma praziquantel concentration reduced

**Prednisolone**

Acetazolamide
Increased risk of hypokalaemia; antagonism of diuretic effect
Acetylsalicylic acid
Increased risk of gastrointestinal bleeding and ulceration; prednisolone reduces plasma salicylate concentration
Amiloride
Antagonism of diuretic effect
Amlodipine
Antagonism of hypotensive effect
Spironolactone
Antagonism of diuretic effect
Vaccine
Influenza High doses of prednisolone impair immune response
Vaccine
Live High doses of prednisolone impair immune response; avoid use of live vaccines with prednisolone
Verapamil
Antagonism of hypotensive effect
Warfarin
Anticoagulant effect possibly enhanced or reduced (highdose prednisolone enhances anticoagulant effect)

**Primaquine**

Artemether +lumefantrine
Manufacturer of artemether + lumefantrine advises avoid concomitant use

**Promethazine**

Alcohol
Enhanced sedative effect
Amitriptyline
Increased antimuscarinic and sedative effects
Atropine
Increased risk of antimuscarinic adverse effects
Diazepam
Enhanced sedative effect

**Propranolol**

Acetazolamide
Enhanced hypotensive effect
Alcohol
Enhanced hypotensive effect
Alcuronium
Enhanced muscle relaxant effect
Amiloride
Enhanced hypotensive effect
Halothane
Enhanced hypotensive effect
Hydralazine
Enhanced hypotensive effect
Methyldopa
Enhanced hypotensive effect
Neostigmine
Antagonism of effect of neostigmine

Suxamethonium
Enhanced muscle relaxant effect
Thiopental
Enhanced hypotensive effect
Vecuronium
Enhanced muscle relaxant effect
Verapamil
Asystole, severe hypotension, and heart failure

**Pyridostigmine**

Alcuronium
Antagonism of muscle relaxant effect
Amikacin
Antagonism of effect of pyridostigmine
Atropine
Antagonism of effect of pyridostigmine
Streptomycin
Antagonism of effect of pyridostigmine
Suxamethonium
Effect of suxamethonium enhanced
Vecuronium
Antagonism of muscle relaxant effect

**Quinine**

Artemether + lumefantrine
Risk of ventricular arrhythmias; manufacturer of artemether + lumefantrine advises avoid concomitant use
Chloroquine
Increased risk of ventricular arrhythmias
Digoxin
Plasma concentration of digoxin increased
Mefloquine
Increased risk of convulsions, but should not prevent the use of intravenous quinine in severe cases
Suxamethonium
Possibly enhanced effects of suxamethonium

**Rifampicin**

Amitriptyline
Plasma concentration of amitriptyline possibly reduced
Antacids (Aluminium hydroxide; Magnesium hydroxide)
Reduced absorption of rifampicin
Chloramphenicol
Accelerated metabolism of chloramphenicol (reduced plasma chloramphenicol concentration)
Ciclosporin
Accelerated metabolism of ciclosporin (reduced plasma ciclosporin concentration)
Quinidine
Accelerated metabolism quinidine (reduced plasma quinidine concentration)
Verapamil
Accelerated metabolism verapamil (plasma concentration significantly reduced)
Warfarin
Accelerated metabolism warfarin (reduced anticoagulant effect)
Zidovudine
Manufacturer of zidovudine advises avoid concomitant use

**Salbutamol**

Acetazolamide
Increased risk of hypokalaemia with high doses of salbutamol
Dexamethasone
Increased risk of hypokalaemia if high doses of salbutamol given with dexamethasone
Digoxin
Possibly reduced plasma concentration of digoxin
Furosemide
Increased risk of hypokalaemia with high doses of

salbutamol

**Thiopental**

Acetazolamide
Enhanced hypotensive effect
Amiloride
Enhanced hypotensive effect
Amitriptyline
Increased risk of arrhythmias and hypotension
Amlodipine
Enhanced hypotensive effect
Vancomycin
Hypersensitivity-like reactions can occur with concomitant intravenous vancomycin
Verapamil
Enhanced hypotensive effect and AV delay

**Timolol**

Acetazolamide
Enhanced hypotensive effect
Alcohol
Enhanced hypotensive effect
Amiloride
Enhanced hypotensive effect
Thiopental
Enhanced hypotensive effect
Verapamil
Asystole, severe hypotension, and heart failure

**Vaccine, Influenza**

Dexamethasone
High doses of dexamethasone impair immune response
Hydrocortisone
High doses of hydrocortisone impair immune response
Phenytoin
Enhanced effect of phenytoin
Prednisolone
High doses of prednisolone impair immune response
Warfarin
Effect of warfarin occasionally enhanced

**Vancomycin**

Amikacin
Increased risk of nephrotoxicity and ototoxicity
Amphotericin B
Streptomycin
Increased risk of nephrotoxicity and ototoxicity
Suxamethonium
Enhanced effects of suxamethonium
Thiopental
Hypersensitivity reactions can occur with concomitant intravenous vancomycin

**Verapamil**

Acetazolamide
Enhanced hypotensive effect
Alcohol
Enhanced hypotensive effect; plasma concentration of alcohol possibly increased by verapamil
Fluphenazine
Enhanced hypotensive effect
Furosemide
Enhanced hypotensive effect
Sodium nitroprusside
Enhanced hypotensive effect
Spironolactone
Enhanced hypotensive effect
Suxamethonium
Enhanced effects of suxamethonium
Thiopental
Enhanced hypotensive effect and AV delay

Timolol
Asystole, severe hypotension, and heart failure
Vecuronium
Enhanced muscle relaxant effect

**Vinblastine**

Bleomycin
Increased risk of cardiovascular toxicity
Erythromycin
Increased toxicity of vinblastine (avoid concomitant use)
Phenytoin
Possibly reduced absorption of phenytoin
Vaccine
Live Avoid use of live vaccines with vinblastine (impairment of immune response)

**Vincristine**

Nifedipine
Possibly reduced metabolism of vincristine
Phenytoin
Possibly reduced absorption of phenytoin
Vaccine
Live Avoid use of live vaccines with vincristine (impairment of immune response)

**Warfarin**

Acetylsalicylic acid
Increased risk of bleeding due to antiplatelet effect
Alcohol
Enhanced anticoagulant effect with large amounts of alcohol; major changes in alcohol consumption may affect anticoagulant control
Allopurinol
Anticoagulant effect possibly enhanced
Amitriptyline
Enhanced or reduced anticoagulant effect
Amoxicillin
Studies have failed to demonstrate an interaction, but common experience in anticoagulant clinics is that INR can be altered by a course of amoxicillin
Ampicillin Studies have failed to demonstrate an interaction, but common experience in anticoagulant clinics is that INR can be altered by a course of ampicillin
Azathioprine
Anticoagulant effect possibly reduced
Azithromycin
Possibly enhanced anticoagulant effect of warfarin
Chloramphenicol
Enhanced anticoagulant effect
Ciprofloxacin
Enhanced anticoagulant effect
Clomipramine
Enhanced or reduced anticoagulant effect
Contraceptives
Oral Antagonism of anticoagulant effect by estrogens and progestogens
Dexamethasone

Anticoagulant effect possibly enhanced or reduced (highdose dexamethasone enhances anticoagulant effect)

Doxycycline Anticoagulant effect possibly enhanced

Erythromycin

Enhanced anticoagulant effect

Etoposide

Possibly enhanced anticoagulant effect

Fluconazole

Enhanced anticoagulant effect

Fluorouracil

Anticoagulant effect possibly enhanced

Fluoxetine

Anticoagulant effect possibly enhanced

Glibenclamide

Possibly enhanced hypoglycaemic effect and changes to anticoagulant effect

Valproic acid

Anticoagulant effect possibly enhanced

## Appendix 3:Drug use During Pregnancy

During pregnancy the mother and the fetus form a non-separable functional unit. Maternal well-being is an absolute prerequisite for the optimal functioning and development of both parts of this unit. Consequently, it is important to treat the mother whenever needed while protecting the unbornchildto the greatest possible extent.

Drugs can have harmful effects on the fetus at any time during pregnancy. It is important to remember this when prescribing for a woman ofchildbearing age or for a man trying to father achild. However, irrational fear of using drugs during pregnancy can also result in harm. Untreated illness, impaired maternal compliance, suboptimal treatment, and treatment failures may all impose risk to maternal well-being, and may also affect the unbornchild. It is important to know the "background risk" in the context of the prevalence of drug-induced adverse pregnancy outcomes. Major congenital malformations occur in 2–4% of all live births. Up to 15% of all diagnosed pregnancies will result in fetal loss.

The cause of these adverse pregnancy outcomes is understood in only a minority of cases.

During the first trimester drugs may produce congenital malformations (teratogenesis), and the greater risk is from the third to the eleventh week of pregnancy. During the second and third trimester drugs may affect the growth and functional development of the fetus or have toxic effects on fetal tissues. Drugs given shortly before term or during labour may have adverse effects on labour or on the neonate after delivery. Few drugs have been shown conclusively to be teratogenic in man but no drug is safe beyond all doubt in early pregnancy. Screening procedures are available where there is a known risk of certain defects.

**Absence of a medicine from the list does not imply safety**

| Medicine | Comment |
|---|---|
| Amitriptyline | Manufacturer advises avoid unless essential, particularly during first and third trimesters |
| Amlodipine | No information on use in humans; risk to fetus should be balanced against risk of uncontrolled maternal hypertension |
| Amphotericin B | Not known to be harmful but use only if potential benefit outweighs risk |
| Artemether | First trimester: Avoid |
| Artesunate | First trimester: Avoid |
| Atenolol | May cause intrauterine growth restriction, neonatal hypoglycaemia, and bradycardia; risk greater in severe hypertension |
| Atropine | Not known to be harmful |
| Azathioprine | Transplant patients should not discontinue azathioprine on becoming pregnant; use in pregnancy should be carefully supervised; there is no evidence that azathioprine is teratogenic but premature birth and low birth weight and spontaneous abortion reported following maternal orpaternal exposure |
| Azithromycin | Limited information available; use only if adequate alternatives not available |
| Beclometasone | Benefit of treatment, for example in asthma, outweighs risk |
| Benzathine benzylpenicillin | Not known to be harmful |
| Betamethasone | Benefit of treatment, for example in asthma, outweighs risk |
| Bupivacaine | Third trimester: With large doses, neonatal respiratory depression, hypotonia, and bradycardia after paracervical or epidural block; lower doses of bupivacaine for intrathecal use during late pregnancy |
| Calcium folinate | Manufacturer advises use only if potential benefit outweighs risk |
| Carbamazepine | First trimester: Risk of teratogenesis including increased risk of neural tube defects (counselling and screening and adequate folate supplements advised, for example, 5 mg daily); risk of teratogenicity greater if more than one antiepileptic used; Third trimester: May possibly cause vitamin K deficiency and risk of neonatal bleeding; if vitamin K not given at birth, neonate should be monitored closely for signs of bleeding |
| Cefixime Ceftazidime Ceftriaxone | Not known to be harmful |
| Chlorambucil | Avoid; use effective contraception during administration to men or women |
| Chloramphenicol | Third trimester: Neonatal "grey" syndrome Chloroquine First and third trimesters: Benefit of prophylaxis and treatment in malaria outweighs risk; |
| Chlorphenamine | No evidence of teratogenicity Chlorpromazine Third trimester: Extrapyramidal effects in neonate occasionally reported |
| Ciclosporin | There is less experience of ciclosporin in pregnancy but it does not appear to be any more harmful than azathioprine; use in pregnancy should be supervised in specialist units |
| Ciprofloxacin | Avoid (arthropathy in animal studies); safer alternatives available |
| Cisplatin | Avoid (teratogenic and toxic in animal studies) |
| Clomipramine | Manufacturer advises avoid unless essential, particularly during first and third trimesters |
| Cyclophosphamide | Avoid; use effective contraception during and for at least 3 months after |

| Medicine | Comment |
|---|---|
| | administration to men or women; |
| Cytarabine | Avoid (teratogenic in animal studies) |
| Dacarbazine | Avoid (carcinogenic and teratogenic in animal studies); use effective contraception during and for at least 6 months after administration to men or women |
| Dactinomycin | Avoid (teratogenic in animal studies) |
| Daunorubicin | Avoid (teratogenic and carcinogenic in animal studies) |
| Dexamethasone | Benefit of treatment, for example in asthma, outweighs risk; risk of intrauterine growth retardation on prolonged or repeated systemic treatment; corticosteroid cover required by mother during labour; monitor closely if fluid retention |
| Diazepam | 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) |
| Doxorubicin | Avoid (teratogenic and toxic in animal studies); with liposomal product use effective contraception during and for at least 6 months after administration to men |
| Doxycycline | First trimester: Effects on skeletal development in animal studies Second and third trimesters: Dental discoloration; maternal hepatotoxicity with large doses Efavirenz Avoid (potential teratogenic effects) |
| Ephedrine | Increased fetal heart rate reported with parenteral |
| Etoposide | Avoid (teratogenic in animal studies |
| Fluorouracil | Avoid (teratogenic); |
| Fluoxetine | Manufacturer advises use only if potential benefit outweighs risk; risk of neonatal withdrawal |
| Fluphenazine | Third trimester: Extrapyramidal effects in neonate occasionally reported |
| Furosemide | Not used to treat hypertension in pregnancy |
| Gentamicin | Second and third trimesters: Auditory or vestibular nerve damage; risk probably very small with gentamicin, but avoid unless essential (if given, serum gentamicin concentration monitoring essential) |
| Glibenclamide | Third trimester: Neonatal hypoglycaemia; insulin is normally substituted in all diabetics; if oral drugs are used, therapy should be stopped at least 2 days before delivery |
| Haloperidol | Third trimester: Extrapyramidal effects in neonate occasionally reported |
| Halothane | Third trimester: Depresses neonatal respiration |
| Heparin | Maternal osteoporosis has been reported after prolonged use; multidose vials may contain benzyl alcohol; some manufacturers advise avoid |
| Hydralazine | Avoid during first and second trimesters; no reports of serious harm following use in third trimester |

| Medicine | Comment |
|---|---|
| Hydrocortisone | Benefit of treatment, for example in asthma, outweighs risk; risk of intrauterine growth retardation on prolonged or repeated systemic treatment; corticosteroid cover required by mother during labour; monitor closely if fluid retention |
| Ibuprofen | Avoid unless potential benefit outweighs risk Third trimester: With regular use closure of fetal ductus arteriosus in utero and possibly persistent pulmonary hypertension in the newborn; delayed onset and increased duration of labour |
| Levodopa + carbidopa | Toxicity in animal studies |
| Lidocaine | Third trimester: With large doses, neonatal respiratory depression, hypotonia, and bradycardia after paracervical or epidural block |
| Lithium | First trimester: Avoid if possible (risk of teratogenicity including cardiac abnormalities) Second and third trimesters: Dose requirements increased (but on delivery return to normal abruptly); close monitoring of serum lithium concentration advised (risk of toxicity in neonate) |
| Magnesium sulfate | Third trimester: not known to be harmful for shortterm intravenous administration in eclampsia but excessive doses may cause neonatal respiratory depression |
| Methotrexate | Avoid (teratogenic); fertility may be reduced during therapy but this may be reversible; use effective contraception during and for at least 6 months after administration to men or women |
| Morphine | Third trimester: Depresses neonatal respiration; withdrawal effects in neonates of dependent mothers; gastric stasis and risk of inhalation pneumonia in mother during labour |
| Paracetamol | Not known to be harmful |
| Phenobarbital | First and third trimesters: Congenital malformations risk of teratogenicity greater if more than one antiepileptic used; may possibly cause vitamin K deficiency and risk of neonatal bleeding; if vitamin K not given at birth, neonate should be monitored closely for signs of bleeding |
| Phenytoin | First and third trimesters: Congenital malformations (screening advised); adequate folate supplements should be given to mother (for example, folic acid 5 mg daily); risk of teratogenicity greater if more than one antiepileptic used; may possibly cause vitamin K deficiency and risk of neonatal bleeding; if vitamin K not given at birth, neonate should be monitored closely for signs of bleeding |
| Praziquantel | *T. solium* infections in pregnancy should be treated immediately treatment in schistosomiasis outweighs risk; if immediate treatment not considered essential for fluke infections, treatment should be delayed until after delivery |
| Prednisolone | Benefit of treatment, for example in asthma, outweighs risk; risk of intrauterine growth retardation on prolonged or repeated |

| Medicine | Comment |
|---|---|
| | systemic treatment; corticosteroid cover required by mother during labour; monitor closely if fluid retention |
| Primaquine | Third trimester: Neonatal haemolysis and methaemoglobinaemia; delay treatment until after delivery |
| Promethazine | No evidence of teratogenicity |
| Pyrazinamide | Use only if potential benefit outweighs risk |
| Pyridostigmine | Third trimester: Neonatal myasthenia with large doses |
| Pyrimethamine | First trimester: Theoretical teratogenic risk (folate antagonist); adequate folate supplements should be given to the mother; avoid in pneumocystosis and toxoplasmosis |
| Salbutamol | Appropriate to use for asthma; high doses should be given by inhalation only —parenteral use can affect the myometrium and possibly cause cardiac problems |
| Streptomycin | Second and third trimesters: Auditory or vestibular nerve damage; avoid unless essential (if given, serum streptomycin concentration monitoring essential) |
| Suxamethonium | Mildly prolonged maternal paralysis may occur |
| Thiopental | Third trimester: Depresses neonatal respiration; dose should not exceed 250 mg First trimester: Teratogenic risk (folate antagonist) |
| Vaccine, Yellow fever | First trimester: Theoretical risk of congenital malformations, however need for vaccination may outweigh possible risk to fetus especially after the 6th month of pregnancy; pregnant women should be advised *not* to travel to areas where there is a risk of exposure to yellow fever; |
| Valproic acid | First and third trimesters: Increased risk of congenital malformations and developmental delay (counseling and screening advised — folic acid supplements may reduce risk of neural tube defects); risk of teratogenicity greater if more than one antiepileptic used; neonatal bleeding (related to hypofibrinaemia) and neonatal hepatotoxicity also reported |
| Vancomycin | Use only if potential benefit outweighs risk — plasma vancomycin concentration monitoring essential to reduce risk of fetal toxicity |
| Vinblastine | Avoid (limited experience suggests fetal harm; teratogenic in animal studies) Vincristine Avoid (teratogenicity and fetal loss in animal studies); |
| Warfarin | Congenital malformations; fetal and neonatal |

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