The Jessop Wing, Sheffield Teaching Hospitals NHS Trust

Neonatal Formulary (9th Edition)

This formulary has been compiled to accurately reflect prescribing practise on the neonatal unit at the Jessop Wing of the Sheffield Teaching Hospitals NHS Trust. Drugs have not been included if they are never used in this location. Our aim in compiling this formulary has been to provide easily accessible, clear and concise information. If further details about any of the drugs prescribed are required, refer to the sources of information below which are all kept in the Pharmacy at the Jessop Wing.


Drug Interactions. Stockley IH at www.medicinescomplete.com


The 1995 Formulary. The Hospital for Sick Children, Toronto, Ontario, Canada

BNF for Children. 2006

The doses of drugs and the timing regimes incorporated in this formulary have been checked against a wide range of sources. If, while using this formulary, any errors or instances where there is a lack of clarity are detected, please notify one of us immediately and if there are felt to be any cases where a prescribing error could occur, please delete this page from the formulary and once again contact us.

Christine Nye
Alan Gibson
Helen Beastall
Joy Buckley
Units

1 kilogram (kg) = 1000 grams
1 gram (g) = 1000 milligrams
1 milligram (mg) = 1000 micrograms
1 microgram = 1000 nanograms
1 nanogram = 1000 picograms

A 1% weight by volume (w/v) solution contains 1 gram of substance in 100 mL of solution. A 10% weight by volume (w/v) solution contains 10 grams of substance in 100 mL of solution.

It therefore follows that:

1 mL of a 1% solution (1:100) will contain 10 milligrams of substance
1 mL of a 0.1% solution (1:1000) will contain 1 milligram of substance
1 mL of a 0.01% solution (1:10000) will contain 100 micrograms of substance

!!! Adverse drugs reactions !!!

If any adverse reaction to a drug is observed consider notifying this to the Regional Monitoring scheme for Paediatric Adverse Reactions. Full details of reactions that should be reported, a sample of the yellow card and full details of the monitoring scheme are available from pharmacy.
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Drugs (in alphabetical order)

A

Aciclovir
Adenosine
Adrenaline
Alprostadil (Prostaglandin E₁)
Alteplase (rtPA)
Aminophylline
Amphotericin (Liposomal)
Amoxicillin
Atropine
AZT - see Zidovudine

B

BCG vaccine SSI - intradermal
Benzylpenicillin sodium

C

Caffeine citrate
Calcium chloride
Calcium resonium
Camitine
Cefotaxime
Ceftazidime
Chloral hydrate
Chloramphenicol
Chlorothiazide
Chlorphenamine (Chlorpheniramine)
Clonazepam
Curosurf
Cyclopentolate eye drops

D

Dexamethasone
Digoxin
Diphtheria, tetanus, accellular pertussis, inactivated poliomyelitis and haemophilus type B conjugated vaccine
Dobutamine
Domperidone
Dopamine
Dornase Alfa
Doxapram

E

Enoxaparin
Erythromycin
Erythropoietin

F

Fentanyl
Flecainide
Flucloxacillin
Fluconazole
Flucytosine
Flumazenil
Folic acid
Furosemide (Frusemide)

G

Gaviscon
Gentamicin
Glucose gel (Hypostop)
Glucose infusion

H

Heparin sodium
Hepatitis B immunoglobulin
Hepatitis B vaccine
Human albumin solution
Hyaluronidase
Hydralazine
Hydrocortisone sodium phosphate
Ibuprofen
Immunoglobulin
Indometacin (Indomethacin)
Insulin (Human neutral)
Isoprenalin

Pancuronium bromide
Paracetamol
Paraldehyde
Phenobarbital (Phenobarbitone)
Phenylephrine eye drops
Phenytoin
Potassium acid phosphate
Potassium canrenoate
Potassium chloride
Propranolol
Prostaglandin E₁ (Alprostadil)
Protamine sulphate
Pyridoxine

Levothyroxine
Lidocaine (Lignocaine)
Liothyronine

Magnesium sulphate
Meningococcal C vaccine
Meropenem
Metronidazole
Miconazole
Midazolam
Morphine sulphate
Morphine sulphate (for NAS)
Multivitamins
Mupirocin

Naloxone hydrochloride
Nitric oxide
Nystatin

Octreotide

Ranitidine
Rifampicin

Salbutamol
Sodium bicarbonate
Sodium chloride
Sodium ferredate (Sodium ironedetate)
Spironolactone
Sucralfate ointment
Sucrose 24% (Sweet-Ease)

Tazocin
Teicoplanin
Tetracaine (Amethocaine)
Tolazoline
Trimethoprim
Trometamol (Tham)

Vancomycin
Varicella-zoster immunoglobulin
Vitamin D (Calciferol)
Vitamin K₁ (Phytomenadione)

Zidovudine
Aciclovir

Prevents DNA synthesis of herpes viruses by inhibition of viral DNA polymerase enzyme. Aciclovir is incorporated into viral DNA and prevents viral replication.

Indications for use
Treatment and prophylaxis of herpes simplex (types I and II) and varicella zoster infections.

Preparation
25 mg in 1 mL solution in 10 mL
Add 1 mL of the solution to 4 mL of diluent to produce a final concentration of 5 mg in 1 mL
After reconstitution use immediately and discard remainder.

Administration

Dosage

Prophylaxis
15 mg/kg  12 hourly < 34 weeks
8 hourly ≥ 34 weeks

Treatment of CNS and disseminated herpes simplex disease
20 mg/kg 8 hourly

Minimum course of 14 days
CNS and disseminated herpes simplex virus for 21 days

Renal impairment
15 mg/kg  12 hourly in mild renal impairment
15 mg/kg  24 hourly in moderate renal impairment
7.5 mg/kg  24 hourly in severe renal impairment

Routes
Slow IV infusion over 1 hour
Oral administration is not recommended as only 10 to 20% of the dose is absorbed.

Compatibility
Glucose 5%
Glucose 4.0% / sodium chloride 0.18%
Sodium chloride 0.9%

Incompatibility
Amphotericin
Dobutamine
Dopamine
Metronidazole
Morphine sulphate
Parenteral nutrition
Interactions

Storage

Locked medicine cupboard. Use once only then discard remainder.

If refrigerated precipitation may occur. This will re-dissolve on warming to room temperature without loss of potency.

Side Effects

Abnormal liver function tests
Increase in urea and creatinine
Anaemia
Thrombocytopenia
Leucopenia
Renal impairment
Local reaction
Rash
Gastrointestinal disturbance
Convulsions
Agitation
Tremor
Angioedema
Anaphylaxis
Photosensitivity

Contra-indications

None known

Other

Maintain adequate hydration to prevent deposition in the renal tubules

The drug is most effective early in the infection as incorporation into viral DNA is highly selective for infected cells during the phase of viral replication

If varicella zoster infection is suspected then use of varicella-zoster Immunoglobulin should be discussed with senior staff at the Public Health Laboratory Service

In CNS and disseminated herpes simplex virus disease decreasing the aciclovir dosage or administering granulocyte colony – stimulating factor should be considered if the absolute neutrophil count remains below 500/mm³ for a prolonged period

# Adenosine

Anti-arrhythmic agent
Stimulates adenosine receptors and slows conduction through the atrio-ventricular node

## Indications for use
Paroxysmal supraventricular tachycardia

## Preparation
3 mg in 1 mL - solution supplied in 2 mL vials

## Administration

<table>
<thead>
<tr>
<th><strong>Dosage</strong></th>
<th>150 micrograms/kg/dose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Increase by 50 micrograms/kg/dose every 2 minutes to a maximum of 300 micrograms/kg/dose</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Routes</strong></th>
<th>IV very rapidly (over 2 seconds) - flushed through with sodium chloride 0.9%</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th><strong>Compatibility</strong></th>
<th>Sodium chloride 0.9%</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th><strong>Incompatibility</strong></th>
<th>Amphotericin</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th><strong>Interactions</strong></th>
<th>Theophylline can inhibit effect of adenosine</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Caffeine can inhibit effect of adenosine</td>
</tr>
</tbody>
</table>

## Storage
Locked medicine cupboard
**Side Effects**

- Flushing
- Dyspnoea
- Bronchospasm
- Sweating
- Palpitations
- Hyperventilation
- Bradycardia
- Heart block
- Asystole

Continuous cardiac monitoring must be used and facilities for cardio-respiratory resuscitation must be available. Continuous ECG tracing should be performed whenever possible during administration of adenosine.

**Contra-indications**

- 2nd or 3rd degree atrio-ventricular block
- Sick sinus syndrome

**Other**

A recent report has shown that the usually quoted starting does of 50 micrograms/kg/dose is effective in <10% of infants and children and 100 micrograms/kg/dose is effective in <25% of infants and 50% of children. 150 micrograms/kg/dose is more effective in children (~80%) than in infants (~35%). There thus seems little point in starting at a dose of 50 micrograms/kg/dose as has been the case up until now.

Adrenaline

Stimulates alpha and beta-adrenergic receptors
Increases the strength and rate of cardiac contractions and causes peripheral vasoconstriction

**Indications for use**

To increase blood pressure (adrenaline will increase both systolic and diastolic pressures)

As a cardiac stimulant in asystole, or profound intractable bradycardia

**Preparation**

1:1,000 in 1 mL ampoules (1000 micrograms in 1 mL)

1:10,000 in 10 mL ampoules (100 micrograms in 1 mL)

**Administration**

**Dosage**

**Hypotension:**

0.2 micrograms/kg/minute, increasing until response observed

Add 1.2 mL of Adrenaline 1:1000 concentrated solution to 18.2 mL of glucose 5% to produce a final concentration of 60 micrograms in 1 mL

ADREnaline 60mcg/ml

1200 µg/20 ml (60 µg/ml)

Add 4 mL of Adrenaline 1:1000 concentrated solution to 16 mL of glucose 5% to produce a final concentration of 200 micrograms in 1 mL

ADREnaline 200mcg/ml

4000 µg/20 ml (200 µg/ml)

Resuscitation:

0.1 mL/kg of 1:10,000 increasing to 0.3 mL/kg of 1:10,000 IV or IO

Dose for intracardiac administration is the same as for IV administration

Anaphylaxis

Preterm infants

10 micrograms/kg 0.01 mL/kg of 1:1000 by deep IM

Term to 6 months

50 micrograms 0.05 mL of 1:1000 by deep IM

6 months to 6 years

120 micrograms 0.12 mL of 1:1000 by deep IM

Dose may be repeated after 5 minutes if no clinical improvement
Routes
- IV infusion
- IO
- ET
- Intracardiac injection

Compatibility
- Glucose 5%
- Glucose 10%
- Glucose 4.0% / sodium chloride 0.18%
- Sodium chloride 0.9%

(Glucose 10% stable for 1 hour)

Incompatibility
- Alkalis
- Amphotericin
- Metronidazole
- Sodium bicarbonate

Interactions
- Beta blockers: pressor effects may be markedly increased
- Doxapram: risk of hypertension

Storage
Locked refrigerator at 2° to 8°C

Side Effects
- Tachycardia
- Hypoglycaemia
- Arrhythmias
- Bradycardia
- Urinary retention
- Hypotension
- Cardiac arrest
- Hypertension

Contra-indications
None known

Other
If there is no response at this dose a maximum of 1.0 mL/kg of 1:10,000 IV has been used. However, there is no evidence of any benefit and some evidence to suggest higher doses may be dangerous.

Resuscitation Council guidelines (2005) state that administration of adrenaline via an ET route is no longer considered appropriate.

1 Resuscitation at birth. The newborn life support manual. Resuscitation Council UK 2005
Alprostadil (Prostaglandin E₁)

Vasodilator with specific action on the tissues of the ductus arteriosus
Inhibitor of platelet aggregation

Indications for use
To maintain or restore patency of the ductus arteriosus
Only to be used in infants who are ventilated or where ventilation is immediately available

Preparation
500 micrograms in 1 mL

Low dose  <20 nanograms/kg/minute
Add 0.1 mL of alprostadil 500 micrograms in 1 mL to 49.9 mL of glucose 5% or sodium chloride 0.9% to produce a final concentration of 1 microgram in 1 mL
ALprostad 1000ng/ml
50 µg/50 ml (1 µg/ml)

High dose  ≥20 nanograms/kg/minute
Add 0.4 mL of alprostadil 500 micrograms in 1 mL to 49.6 mL of glucose 5% or sodium chloride 0.9% to produce a final concentration of 4 microgram in 1 mL
ALprostad 4000ng/ml
200 µg/50 ml (4 µg/ml)

Do not store undiluted solution in plastic syringes. Dilute immediately after drawing up the solution as prostaglandin E₁ can react with the plastic causing formation of a haze. If this occurs the solution and syringes should be discarded immediately and replaced with fresh solution

Administration
Dosage
10 nanograms/kg/minute
Initial dose should be increased until desired effect is obtained
Doses up to 400 nanograms/kg/minute have been reported

Routes
Intravenous infusion
May be given orally but only on the recommendation of a paediatric cardiologist
| Compatibility     | Glucose 5%  
<table>
<thead>
<tr>
<th></th>
<th>Sodium chloride 0.9%</th>
</tr>
</thead>
</table>
| Incompatibility   | Amphotericin  
|                  | Metronidazole  |
| Interactions      |                      |
| Storage           | Locked refrigerator at 2° to 8° C  |
| Side Effects      | Apnoea  
|                  | Cardiac arrest  
|                  | Hypotension  
|                  | Convulsions  
|                  | Tachycardia  
|                  | Disseminated intravascular coagulation  
|                  | Bradycardia  
|                  | Diarrhoea  
|                  | Hypothermia  
|                  | Fever  |
| Contra-indications| None  |
| Other             |                      |
Alteplase (rtPA)

A glycoprotein that activates plasminogen directly to form plasmin. Acts as a fibrinolytic agent used to dissolve intravascular thrombi or thrombi in intravascular cannulae. Has an action localised to the clot thus avoiding the more generalised actions of streptokinase and urokinase.

**Indications for use**

- Occlusive thrombi causing serious vascular compromise in major vessels
- Occluded central venous catheters

**Preparation**

- 20 mg of dry powder
- Reconstitute with 20 mL of sterile water (supplied with the alteplase) to produce a working concentration of 1 mg in 1 mL

**Administration**

**Dosage**

Initial dilution should be with water for injection provided; subsequent dilution with 0.9% sodium chloride only. It must not be further diluted with either water or glucose solution.

*For arterial and venous thrombosis*

- Initiate treatment at an infusion rate of 100 micrograms/kg/hr
- Measure fibrinogen hourly and adjust infusion rate to maintain fibrinogen concentration >100 mg/dl
- After 6 hours of therapy without response increase infusion by 100 micrograms/kg/hr at 6 hourly intervals to a maximum concentration of 500 micrograms/kg/hr

*For occluded central venous catheters*

- Instil no more than 0.5 mL of the 1 mg in 1 mL solution into the cannula and leave for 4 hours (0.3 mL is adequate for normal central venous catheters). Attempt to withdraw the solution after 4 hours and see if the catheter will then sample. If catheter remains occluded repeat once only

**Routes**

- IV infusion – continuous
- Bolus instilled into catheter for catheter occlusions only

**Compatibility**

- Sodium chloride 0.9%
Incompatibility

Alteplase must not be mixed with any other drugs either in the same infusion or in the same catheter

Interactions

Assume that all drugs may interact

Anticoagulants and platelet aggregation inhibitors will increase the risk of haemorrhage

Storage

Stored at room temperature

Side Effects

Nausea
Vomiting
Haemorrhage

Contra-indications

Recent haemorrhage, trauma or surgery
Coagulation defects
Haemorrhagic diathesis
Gastric ulceration
Severe hypertension
Severe liver disease
Pre-existing intraventricular haemorrhage or cerebral ischaemic changes

Other

If severe bleeding results, infuse fresh frozen plasma or fresh blood. Synthetic antifibrinolytics may be required.

2 Toronto Hospital for Sick Children - unpublished data
3 Urokinase update on http://www.nppg.demon.co.uk/urokinase.htm
## Aminophylline

**Methylxanthine**

### Indications for use

Adjunct to promote diuresis

### Preparation

25 mg in 1 mL  
Add 2 mL of 25 mg in 1 mL solution to 48 mL glucose 5% or sodium chloride 0.9 % to produce a final concentration of 1 mg in 1 mL  
AminoPHYline 1mg/ml  
50 mg/50 ml (1 mg/ml)

### Administration

<table>
<thead>
<tr>
<th><strong>Dosage</strong></th>
<th>4 mg/kg&lt;sup&gt;1&lt;/sup&gt;</th>
<th>0.2 mg/kg/hour continuous infusion&lt;sup&gt;1&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loading</td>
<td>Maintenance</td>
<td>Increasing to 0.6 mg/kg/hour if necessary</td>
</tr>
</tbody>
</table>

Dosage is that recommended provided there is concomitant administration of furosemide.

<table>
<thead>
<tr>
<th><strong>Route</strong></th>
<th>Loading infusion over 30 minutes</th>
<th>Maintenance continuous infusion</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th><strong>Compatibility</strong></th>
<th>Glucose 5%</th>
<th>Sodium chloride 0.9%</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th><strong>Incompatibility</strong></th>
<th>Dobutamine</th>
<th>TPN</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th><strong>Interactions</strong></th>
<th>Barbiturates</th>
<th>metabolism of theophylline accelerated</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Benzodiazepines</td>
<td>reduces effect of benzodiazepines</td>
</tr>
<tr>
<td></td>
<td>Corticosteroids</td>
<td>increased risk of hypokalaemia</td>
</tr>
<tr>
<td></td>
<td>Doxapram</td>
<td>increased CNS stimulation</td>
</tr>
<tr>
<td></td>
<td>Loop diuretics</td>
<td>increased risk of hypokalaemia</td>
</tr>
<tr>
<td></td>
<td>Phenytoin</td>
<td>plasma concentration of both drugs reduced</td>
</tr>
<tr>
<td></td>
<td>Salbutamol</td>
<td>increased risk of hypokalaemia</td>
</tr>
<tr>
<td></td>
<td>Thiazide diuretics</td>
<td>increased risk of hypokalaemia</td>
</tr>
</tbody>
</table>
Storage  
Locked medicine cupboard

Side Effects  
Tachycardia  
Palpitations  
Nausea and gastrointestinal disturbances  
Headache  
CNS stimulation  
Insomnia  
Arrhythmias  
Convulsions  
Urticaria  
Erythema  
Exfoliative dermatitis

Contra-indications

Other  
Clearance can decrease with reduced hepatic or cardiac function  
If it is felt appropriate to monitor levels the suggested range for this indication is  
8 – 12 mg/L theophylline  
Should not be administered if the baby is on caffeine

### Amphotericin (Liposomal)

Antifungal agent used for treatment of serious disseminated fungal infections. It is associated with a significant risk of toxicity which is reduced by incorporation of the drug into a lipid micelle (liposomal formulation)

<table>
<thead>
<tr>
<th><strong>Indications for use</strong></th>
<th>Systemic, catheter associated, and non-disseminated fungal infections</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th><strong>Preparation</strong></th>
<th>50 mg vial of dry powder</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>To reconstitute add 12 mL of water for injections to 50 mg vial (displacement value 0.5 mL) to produce a concentration of 4 mg in 1 mL</td>
</tr>
<tr>
<td></td>
<td>Withdraw 1 mL of this solution using the 5 micron filter supplied, then add to 3 mL of glucose 5% to produce a final concentration of 1 mg in 1 mL</td>
</tr>
<tr>
<td></td>
<td>Use within 6 hours of dilution</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Administration</strong></th>
<th><strong>Dosage</strong></th>
<th>1 mg/kg/day</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Increasing to 3 mg/kg/day after 2 to 4 days if there has been no significant rise in creatinine</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Single daily dose</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Route</strong></th>
<th>IV infusion over 30 minutes</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th><strong>Compatibility</strong></th>
<th>Glucose 5%</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th><strong>Incompatibility</strong></th>
<th>Do not add sodium chloride 0.9% to the solution</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Do not mix with any other drugs</td>
</tr>
<tr>
<td></td>
<td>Should be administered through a separate IV line</td>
</tr>
<tr>
<td></td>
<td>Do not use with an inline filter</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Interactions</strong></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th><strong>Storage</strong></th>
<th>Locked refrigerator 2° to 8° C</th>
</tr>
</thead>
</table>
**Side Effects**

Rash  
Renal impairment  
Haemolysis  
Vomiting  
Fever  
Diarrhoea  
Hypertension  
Hypotension  
Arrhythmias  
Convulsions  
Peripheral neuropathy  
Anaphylaxis  
Increased urinary excretion of potassium and magnesium  
Cardiac arrest

---

**Contra-indications**

Caution in patients receiving concomitant therapy with nephrotoxic drugs

---

**Other**

Hepatic and renal function must be closely monitored
Amoxicillin

An aminopenicillin with a broader spectrum of activity than benzylpenicillin, particularly against gram -ve bacilli. Mode of action is similar to benzylpenicillin - it interferes with bacterial cell wall synthesis - but is better able to penetrate the outer membrane of some gram -ve bacteria

Indications for use

Broad spectrum antibiotic
First line for suspected infection with listeria

Preparation

500 mg vial of dry powder
To reconstitute add 3.6 mL of water for injections to 500 mg vial (displacement value 0.4 mL) to produce final concentration of 125 mg in 1 mL
25 mg in 1 mL oral syrup

Administration

Dosage

<table>
<thead>
<tr>
<th>Dosage</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 mg/kg</td>
<td>12 hourly if &lt; 7 days old</td>
</tr>
<tr>
<td></td>
<td>8 hourly if ≥ 7 days old</td>
</tr>
<tr>
<td></td>
<td>6 hourly if &gt; 28 days old</td>
</tr>
</tbody>
</table>

Meningitis and listeria infection

<table>
<thead>
<tr>
<th>Dosage</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 mg/kg</td>
<td>12 hourly if &lt; 7 days old</td>
</tr>
<tr>
<td></td>
<td>8 hourly if ≥ 7 days old</td>
</tr>
<tr>
<td></td>
<td>6 hourly if &gt; 28 days old</td>
</tr>
</tbody>
</table>

Renal impairment

<table>
<thead>
<tr>
<th>Dosage</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 mg/kg</td>
<td>12 hourly in moderate renal impairment</td>
</tr>
<tr>
<td></td>
<td>18 hourly in severe renal impairment</td>
</tr>
</tbody>
</table>

Renal impairment in meningitis and listeria infection

<table>
<thead>
<tr>
<th>Dosage</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 mg/kg</td>
<td>12 hourly in moderate renal impairment</td>
</tr>
<tr>
<td></td>
<td>18 hourly in severe renal impairment</td>
</tr>
</tbody>
</table>

Route

IV bolus over 3 minutes
Oral
| Compatibility       | Glucose 5%  
|                    | Glucose 10%  
|                    | Glucose 4.0% / sodium chloride 0.18%  
|                    | Sodium chloride 0.9%  
|                    | Stable for 1 hour except with sodium chloride 0.9%, then stable for 24 hours  
| Incompatibility     | Amphotericin  
|                    | Blood products  
|                    | Fluconazole  
|                    | Gentamicin  
|                    | IV lipid emulsions  
|                    | Midazolam  
| Interactions        |  
| Storage             | Store in a locked refrigerator at 2° to 8° C  
| Side Effects        | Rash  
|                    | Diarrhoea  
|                    | Pseudomembranous colitis  
| Contra-indications  | In adults and older children hypersensitivity reactions can occur but these are seldom encountered in the newborn infant  
| Other               | Diffuses readily into body tissues and fluids, but there is little diffusion into the cerebrospinal fluid  

Atracurium

Short term paralysing agent
Onset of action approximately 2 minutes
Duration of action approximately 15 to 35 minutes

Indications for use
Paralysis
First line agent used prior to longer acting agent - or may be used as sole agent if given by IV infusion

Preparation
10 mg in 1 mL in 2.5 mL ampoule
Add 2 mL of Atracurium 10 mg in 1 mL to 18 mL sodium chloride 0.9% to produce a final concentration of 1 mg in 1 mL
ATRacurium 1mg/ml
20 mg/20 ml (1 mg/ml)

Administration

Dosage
Short term paralysis
0.3 mg/kg stat dose
0.3 mg to 0.9 mg/kg/dose thereafter

Continuous paralysis
0.3 mg/kg/hour as continuous infusion
increasing to 0.9 mg/kg/hour if necessary

Routes
IV bolus
IV infusion continuous

Compatibility
Glucose 5%
Glucose 4.0% / sodium chloride 0.18%
Sodium chloride 0.9%

Incompatibility
Alkalis
Amphotericin
Barbiturates
Phenobarbital
Tazocin
### Interactions
- Acetazolamide
- Furosemide
- Gentamicin
- Propanolol
- Magnesium sulphate
- Midazolam
- Thiazide diuretics

Duration and depth of neuromuscular block may be increased

### Storage
Locked refrigerator at 2° to 8° C

### Side Effects
- Bronchospasm
- Hypotension
- Rash
- Urticaria - histamine release may occur

### Contra-indications
Known allergic hypersensitivity

### Other
Action can be reversed with atropine 20 micrograms/kg IV followed by neostigmine 80 micrograms/kg IV
### Atropine

Peripheral and central anti-muscarinic effects

<table>
<thead>
<tr>
<th>Indications for use</th>
<th>Premedication prior to intubation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparation</td>
<td>600 micrograms in 1 mL ampoule</td>
</tr>
</tbody>
</table>

#### Administration

<table>
<thead>
<tr>
<th>Dosage</th>
<th>10 micrograms/kg/dose 2 hourly if necessary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Route</td>
<td>SC IV Bolus IO</td>
</tr>
</tbody>
</table>

#### Compatibility

Incompatibility: Amphotericin, Metronidazole, Sodium bicarbonate

#### Interactions

#### Storage

Locked medicine cupboard

#### Side Effects

Reduced secretions, Mydriasis, Flushing, Difficulty in micturition, Constipation, Vomiting, Arrhythmias

Toxic doses cause rapid respiration, hyperpyrexia, restlessness and occasionally seizures and if very high can result in coma, collapse and death
| Contra-indications | Use with caution in cardiac failure  
|                    | Hypertension  
|                    | Reduction in gastric motility may affect absorption of other drugs  
| Other              | Administration via infusion not recommended |
# BCG vaccine SSI - intradermal

A freeze dried preparation of a living attenuated strain of bacteria derived from mycobacterium bovis

## Indications for use

Immunisation against tuberculosis

## Preparation

10 dose vial - diluent provided

To reconstitute, add 1 mL of diluent provided to the vial. Do not shake. Invert the vial a few times to re-suspend the BCG completely

Gently swirl the vial of re-suspended vaccine before drawing up each subsequent dose

## Administration

### Dosage

0.05 mL

### Routes

Intra-dermal (normally injected in a site over the insertion of the left deltoid)

Subcutaneous injection should be avoided

Multiple puncture devices should not be used to administer this vaccine

Avoid administration into the leg in the newborn infant as this can cause a severe reaction

### Compatibility


### Incompatibility


### Interactions


### Storage

Locked refrigerator at 2˚ to 8˚ C

Stable for up to 4 hours after re-constitution
**Side Effects**

- Rash
- Fever
- Local reaction
- Pain
- Lymphadenopathy
- Discharging ulcer
- Anaphylaxis

**Contra-indications**

Should not be given to babies receiving corticosteroids or for 3 months after steroid therapy.

If mother has received continuous or high dose steroids prior to delivery, BCG should not be administered until adrenal function has been assessed in the infant.

**Babies born to HIV positive mothers**

**Other**

May be given concurrently with inactivated, or live vaccines, but no other vaccinations should be given into the same arm for at least 3 months because of the risk of regional lymphadenitis.

If live vaccines are not given at the same time an interval of 4 weeks should be allowed between doses.

Consent form necessary.

Community Health Sheffield should be notified and informed of batch number of the vaccine immediately after administration.

The vaccine must not be contaminated with any antiseptic or detergent. Avoid contamination with bactericides. If the skin, or the vial, is swabbed with alcohol it must be allowed to evaporate before using the vaccine.
Benzylpenicillin sodium

One of the first of the penicillin family of antibiotics yet remains a useful and important medication. It is bactericidal - acting by interfering with bacterial cell wall synthesis. Diffuses readily into body tissues and fluids but penetration of the cerebrospinal fluid is limited. The drug of choice for pneumococcal, streptococcal, gonococcal and meningococcal infections

Indications for use
First line antibiotic if streptococcal infections are suspected or proven
Initial treatment of suspected sepsis acquired at birth
Administered to infants born after prolonged rupture of membranes prior to results of septic screen

Preparation
600 mg vial of dry powder
To reconstitute add 11.6 mL of water for injections to 600 mg vial (displacement value 0.4 mL) to produce a final concentration of 50 mg in 1 mL

Administration

<table>
<thead>
<tr>
<th>Dosage</th>
<th>Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 mg/kg</td>
<td>12 hourly if &lt; 7 days old</td>
</tr>
<tr>
<td></td>
<td>8 hourly if 7 to 28 days old</td>
</tr>
<tr>
<td></td>
<td>6 hourly if &gt; 28 days old</td>
</tr>
</tbody>
</table>

Meningitis
75 mg/kg 8 hourly

Routes
IV over 3 minute

Compatibility
Glucose 5%
Glucose 10%
Glucose 4.0% / sodium chloride 0.18%
Sodium chloride 0.9%

Incompatibility
Amphotericin
Metronidazole
Protamine sulphate
Vancomycin
### Interactions

<table>
<thead>
<tr>
<th>Storage</th>
<th>Store in a locked refrigerator at 2° to 8° C</th>
</tr>
</thead>
</table>

### Side Effects

<table>
<thead>
<tr>
<th>Rash</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diarrhoea</td>
</tr>
</tbody>
</table>

### Contra-indications

<table>
<thead>
<tr>
<th>Previous hypersensitivity reaction</th>
</tr>
</thead>
</table>

### Other

Can be given IM but this is painful and this route should only be used in emergencies and the following strengths should be used:

Add 1.6 mL of water for injections to 600 mg vial (displacement value 0.4 mL) to produce a final concentration of 300 mg in 1 mL

---

1. [http://www.gbs.org.uk](http://www.gbs.org.uk)
Caffeine citrate

Methylxanthine which stimulates the central nervous system

Indications for use
First line treatment for apnoea of prematurity

Preparation
10 mg caffeine citrate in 1 mL injection. Administer undiluted
10 mg caffeine citrate in 1 mL oral solution

Administration
Dosage Must always be prescribed as caffeine citrate

Loading: 50 mg/kg

Maintenance: 12 mg/kg once daily

Route Oral: may be divided and given as 2 separate doses 1 hour apart

IV:
Loading: infusion over 30 minutes

Maintenance: bolus over 5 minutes

Compatibility

Incompatibility

Interactions Adenosine effect of adenosine may be inhibited
Chloramphenicol chloramphenicol levels may be reduced
Erythromycin may increase caffeine levels
Fluconazole increased caffeine levels

Storage Locked medicine cupboard

Side Effects Vomiting
Hypotension
Irritability
Convulsions
Extravasation may cause tissue necrosis
Contra-indications

None known

Other

Plasma caffeine levels should be monitored if there is any clinical suspicion that the administered dose could be either too high or too low. In the absence of side effects and if apparently effective, therapeutic monitoring is not required.

Caffeine should be stopped as soon as symptoms have largely resolved and wherever possible by a corrected gestational age of 35 weeks.

Levels should be monitored at least 6 hours after the previous dose, assuming steady state levels have been reached.

Recommended therapeutic range for caffeine is 26 to 40 micrograms/mL.

Because of the prolonged half life there should be continued ECG surveillance and/or clinical monitoring for at least 1 week after caffeine has been stopped.
# Calcium chloride

**Essential electrolyte**

<table>
<thead>
<tr>
<th>Indications for use</th>
<th>Treatment of hypocalcaemia and hyperkalaemia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparation</td>
<td>1 mmol in 1 mL</td>
</tr>
<tr>
<td></td>
<td>0.54 mmol Ca^{2+} in 1 mL oral syrup (Calcium Sandoz™)</td>
</tr>
<tr>
<td>Administration</td>
<td></td>
</tr>
<tr>
<td>Dosage</td>
<td>0.5 mmol/kg IV</td>
</tr>
<tr>
<td></td>
<td>1 mL/kg oral dose adjusted according to plasma calcium levels</td>
</tr>
<tr>
<td>Routes</td>
<td>IV infusion over 15 minutes</td>
</tr>
<tr>
<td></td>
<td>Oral</td>
</tr>
<tr>
<td>Compatibility</td>
<td>Glucose 5%</td>
</tr>
<tr>
<td></td>
<td>Glucose 10%</td>
</tr>
<tr>
<td></td>
<td>Sodium chloride 0.9%</td>
</tr>
<tr>
<td>Incompatibility</td>
<td>Amphotericin</td>
</tr>
<tr>
<td></td>
<td>Fluconazole</td>
</tr>
<tr>
<td></td>
<td>Indometacin</td>
</tr>
<tr>
<td></td>
<td>Metronidazole</td>
</tr>
<tr>
<td></td>
<td>Morphine sulphate</td>
</tr>
<tr>
<td></td>
<td>Sodium bicarbonate</td>
</tr>
<tr>
<td></td>
<td>Trometamol</td>
</tr>
<tr>
<td></td>
<td>Phosphates - depending on pH, concentration, temperature</td>
</tr>
<tr>
<td>Interactions</td>
<td></td>
</tr>
<tr>
<td>Storage</td>
<td>Locked medicine cupboard</td>
</tr>
<tr>
<td>Side Effects</td>
<td></td>
</tr>
<tr>
<td>----------------------</td>
<td>------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Local reaction</td>
<td></td>
</tr>
<tr>
<td>Extravasation may cause tissue necrosis</td>
<td></td>
</tr>
<tr>
<td>Bradycardia</td>
<td></td>
</tr>
<tr>
<td>Flushing</td>
<td></td>
</tr>
<tr>
<td>Vasodilatation</td>
<td></td>
</tr>
<tr>
<td>Cardiac arrest if given as a rapid bolus</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Contra-indications</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Must not be given by SC or IM injections</td>
<td></td>
</tr>
<tr>
<td>Will cause severe tissue necrosis</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypocalcaemia may be caused by hypomagnesaemia and may prove difficult to correct until the hypomagnesaemia has been corrected</td>
<td></td>
</tr>
<tr>
<td>Infusion site must be closely monitored for extravasation</td>
<td></td>
</tr>
<tr>
<td>Gastric irritation can occur if given orally - for oral administration use Calcium Sandoz™ syrup</td>
<td></td>
</tr>
</tbody>
</table>
Calcium resonium

Cation exchange resin

Indications for use
Hyperkalaemia

Preparation
Add calcium resonium powder to 6 mL/kg of water

Administration

Dosage
500 mg/kg
May be repeated after 12 hours if necessary

Ensure evacuation by colonic irrigation after 8 to 12 hours to effect complete recovery of resin

Routes
PR

Compatibility

Incompatibility

Interactions

Storage
Locked medicine cupboard

Side Effects
Faecal impaction
Hypercalcaemia
Rectal ulceration

Contra-indications
Do not give orally to neonates
Bowel obstruction
Reduced gut motility

Other
ECG must be performed prior to administration of calcium resonium to confirm that the hyperkalaemia is not the result of a haemolyised blood sample

The resin should ideally be prepared in advance using a mixture of water and methylcellulose. The resin can be prepared on the unit immediately prior to use using approximately 10 mL water for each gram of resin.
# Carnitine

Amino acid derivative. Essential for fatty acid metabolism

## Indications for use
Carnitine deficiency

## Preparation
- 200 mg in 1 mL solution for IV infusion
- 300 mg in 1 mL oral solution

## Administration

### Dosage
**Primary deficiency**
- Loading dose: 100 mg/kg over 10 minutes
- Maintenance dose: 4 mg/kg/hour
  - 25 mg/kg 6 hourly orally

**Secondary deficiency**
- 20 mg/kg/day added to parenteral nutrition
- Reduce to 10 mg/kg after 14 days

### Routes
- IV bolus 5 minutes
- IV infusion continuous
- Oral

### Compatibility
- Glucose 5%
- Glucose 10%
- Sodium chloride 0.9%
- Parenteral nutrition - clear fluids

### Incompatibility

### Interactions

### Storage
Locked medicine cupboard

### Side Effects
- Vomiting
- Diarrhoea

### Contra-indications
Other

Caution in renal impairment

In primary deficiency should be administered in combination with arginine, biotin, hydroxocobalamin, sodium benzoate and sodium phenylbutyrate. See emergency metabolic drug pack.
### Cefotaxime

Third generation cephalosporin with a broad spectrum of activity and excellent cerebrospinal fluid penetration

#### Indications for use
- First line for suspected meningitis
- Second line antibiotic

#### Preparation
- 1 g vial of dry powder
- To reconstitute add 19.5 mL of water for injections to a 1 g vial (displacement value 0.5 mL) to produce a final concentration of 50 mg in 1 mL

#### Administration

<table>
<thead>
<tr>
<th>Dosage</th>
<th>Route</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 mg/kg</td>
<td>IV bolus</td>
<td>12 hourly if &lt; 7 days, 8 hourly if 7 to 21 days, 6 hourly if &gt; 21 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td>25 mg/kg/dose in severe renal impairment</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Compatibility</th>
<th>Incompatibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glucose 5%</td>
<td>Alkalis</td>
</tr>
<tr>
<td>Sodium chloride 0.9%</td>
<td>Aminoglycosides</td>
</tr>
<tr>
<td>Metronidazole</td>
<td>Aminophylline</td>
</tr>
<tr>
<td></td>
<td>Fluconazole</td>
</tr>
<tr>
<td></td>
<td>Vancomycin</td>
</tr>
</tbody>
</table>

#### Interactions
- Furosemide: nephrotoxicity

#### Storage
- Store dry vials in a locked medicine cupboard
### Side Effects

- Rash
- Urticaria
- Fever
- Anaphylaxis
- Diarrhoea
- Local reaction
- Abnormal liver function tests

---

### Contra-indications

None known

---

### Other

Nystatin oral suspension and topical must be prescribed concurrently with cephalosporins as candidiasis is likely to develop
Ceftazidime

Third generation cephalosporin with a broad spectrum of activity

Indications for use
Pseudomonas infections

Preparation
250 mg vials of dry powder

To reconstitute add 9.8 mL of water for injections to 250 mg vial (displacement value 0.2 mL) to produce a final concentration of 25 mg in 1 mL

Administration

Dosage

<table>
<thead>
<tr>
<th>Dosage</th>
<th>Interval</th>
<th>Infants</th>
<th>Children</th>
<th>Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 mg/kg</td>
<td>hourly if &lt; 7 days</td>
<td>24</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>25 mg/kg</td>
<td>hourly if 7 to 21 days</td>
<td>12</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>25 mg/kg</td>
<td>hourly if &gt; 21 days</td>
<td>8</td>
<td>4</td>
<td>2</td>
</tr>
</tbody>
</table>

Suspected meningitis
50 mg/kg

Renal impairment
25 mg/kg

<table>
<thead>
<tr>
<th>Dosage</th>
<th>Interval</th>
<th>Infants</th>
<th>Children</th>
<th>Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 mg/kg</td>
<td>hourly if &lt; 7 days</td>
<td>48</td>
<td>24</td>
<td>16</td>
</tr>
<tr>
<td>25 mg/kg</td>
<td>hourly if 7 to 21 days</td>
<td>24</td>
<td>16</td>
<td>8</td>
</tr>
<tr>
<td>25 mg/kg</td>
<td>hourly if &gt; 21 days</td>
<td>16</td>
<td>8</td>
<td>4</td>
</tr>
</tbody>
</table>

Routes
IV bolus over 1 minute

Compatibility
Glucose 5%
Glucose 10%
Glucose 4%/sodium chloride 0.18%

Incompatibility
Aminoglycosides
Fluconazole
Vancomycin

Interactions
Chloramphenicol - reduced efficacy

Storage
Store dry vials in a locked medicine cupboard
### Side Effects
- Diarrhoea
- Urticaria
- Elevated alkaline phosphatase
- Abnormal liver function tests
- Local reaction
- Rash
- Jaundice
- Fever

### Contra-indications
Not known

### Other
Nystatin oral suspension and topical must be prescribed concurrently with cephalosporins as candidiasis is likely to develop
# Chloral hydrate

**Hypnotic**

## Indications for use
Sedation

## Preparation
60 mg in 1 mL oral solution
Dilute with milk

## Administration

<table>
<thead>
<tr>
<th>Dosage</th>
<th>Hypnosis</th>
<th>50 mg/kg single dose</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A dose of up to 75 mg/kg may be needed to induce deep hypnosis if required</td>
<td></td>
</tr>
</tbody>
</table>

|长 term sedation | 30 mg/kg 6 hourly |

<table>
<thead>
<tr>
<th>Routes</th>
<th>Oral</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PR</td>
</tr>
</tbody>
</table>

## Compatibility

## Incompatibility

| Interactions | Furosemide | Sweating, flushes, unstable blood pressure, tachycardia |

## Storage
Locked medicine cupboard

## Side Effects
Excitement
Gastrointestinal disturbance
Abdominal distension
Vomiting
Gastrointestinal tract necrosis
Stricture formation
Jaundice
Methaemoglobinemia
| **Contra-indications** | Cardiac disease - may induce cardiac arrhythmias  
Renal impairment  
Gastric irritation |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Other</strong></td>
<td>Flumazenil may be effective in the management of an overdose but propranolol may be needed to control any arrhythmia</td>
</tr>
</tbody>
</table>
# Chloramphenicol eye drops / ointment

Broad spectrum antibiotic for topical use only

## Indications for use
Eye infections

## Preparation
- **Eye drops** 0.5%
- **Eye ointment** 1%

## Administration

### Dosage
- **Eye drops** 1 drop 2 hourly for 48 hours then reduce to 6 hourly
- **Eye ointment** 6 to 8 hourly

### Routes
Eyes

## Compatibility

## Incompatibility

## Interactions

## Storage
Locked medicine cupboard

## Side Effects
Local reaction

## Contra-indications
None known

## Other
- Once opened, container should be discarded after 14 days
- A separate container should be used for each eye
# Chlorothiazide

**Thiazide diuretic**

## Indications for use
- Hypertension
- Oedema
- Chronic lung disease

## Preparation
- 50 mg in 1 mL oral suspension
- Available on a named patient basis

## Administration

### Dosage
- 10 mg/kg 12 hourly
- Increase to 20 mg/kg if necessary

### Routes
- Oral

## Compatibility

## Incompatibility

## Interactions
- Anti-hypertensives: enhanced effect
  - Barbiturates: enhanced diuretic effect
  - Corticosteroids: increased potassium depletion
  - Opioids: enhance postural hypotension

## Storage
- Locked medicine cupboard
<table>
<thead>
<tr>
<th>Side Effects</th>
<th>Hypokalaemia</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Gastrointestinal disturbance</td>
</tr>
<tr>
<td></td>
<td>Aplastic anaemia</td>
</tr>
<tr>
<td></td>
<td>Hyperglycaemia</td>
</tr>
<tr>
<td></td>
<td>Vomiting</td>
</tr>
<tr>
<td></td>
<td>Hypotension</td>
</tr>
<tr>
<td></td>
<td>Diarrhoea</td>
</tr>
<tr>
<td></td>
<td>Leucopenia</td>
</tr>
<tr>
<td></td>
<td>Haemolysis</td>
</tr>
<tr>
<td></td>
<td>Agranulocytosis</td>
</tr>
<tr>
<td></td>
<td>Constipation</td>
</tr>
<tr>
<td></td>
<td>Thrombocytopenia</td>
</tr>
<tr>
<td></td>
<td>Jaundice</td>
</tr>
</tbody>
</table>

| Contra-indications    | Severe renal or hepatic failure |

| Other                 | Spironolactone is normally prescribed at the same time to reduce the risk of hypokalaemia |
# Chlorphenamine (Chlorpheniramine)

**Antihistamine**

<table>
<thead>
<tr>
<th><strong>Indications for use</strong></th>
<th>Allergic reactions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Preparation</strong></td>
<td>10 mg in 1 mL ampoule</td>
</tr>
<tr>
<td></td>
<td>Add to 9 mL sodium chloride 0.9% or water for injections to produce a final concentration of 1 mg in 1 mL</td>
</tr>
<tr>
<td><strong>Administration</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Dosage</strong></td>
<td>200 micrograms/kg IV diluted in 5 mL sodium chloride 0.9%</td>
</tr>
<tr>
<td><strong>Routes</strong></td>
<td>IV bolus over 1 minute</td>
</tr>
<tr>
<td></td>
<td>IM</td>
</tr>
<tr>
<td><strong>Compatibility</strong></td>
<td>Glucose 5%</td>
</tr>
<tr>
<td></td>
<td>Sodium chloride 0.9%</td>
</tr>
<tr>
<td><strong>Incompatibility</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Interactions</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Storage</strong></td>
<td>Locked medicine cupboard</td>
</tr>
<tr>
<td><strong>Side Effects</strong></td>
<td>Hypotension</td>
</tr>
<tr>
<td></td>
<td>Drowsiness</td>
</tr>
<tr>
<td></td>
<td>Nausea</td>
</tr>
<tr>
<td></td>
<td>Vomiting</td>
</tr>
<tr>
<td></td>
<td>Urinary retention</td>
</tr>
<tr>
<td></td>
<td>Tachycardia</td>
</tr>
<tr>
<td></td>
<td>Arrhythmias</td>
</tr>
<tr>
<td></td>
<td>Allergic reactions</td>
</tr>
<tr>
<td></td>
<td>Photosensitivity</td>
</tr>
<tr>
<td><strong>Contra-indications</strong></td>
<td>Caution in epilepsy and severe hypotension</td>
</tr>
<tr>
<td><strong>Others</strong></td>
<td></td>
</tr>
</tbody>
</table>
Clonazepam

Benzodiazepine with anticonvulsant properties

Indications for use
Convulsions resistant to usual first line anticonvulsants

Preparation
1 mg in 1 mL ampoule accompanied by a 1 mL ampoule containing water for injections as a diluent

*Bolus injection*
Mix solution with supplied diluent and use immediately

*Infusion*
Add 1 mL of clonazepam 1 mg in 1 mL to 9 mL of glucose 5% or sodium chloride 0.9% to produce a final concentration of 100 micrograms in 1 mL
Clonaz 100mcg/ml
1000 µg/10 ml (100 µg/ml)

Administration

Dosage
*Loading dose*¹: 200 micrograms/kg

*Maintenance dose*¹: 10 to 30 micrograms/kg/hr

Routes
IV bolus over 5 minutes
IV infusion

Compatibility
Glucose 5%
Glucose 10%
Sodium chloride 0.9%

Incompatibility
Amphotericin
Metronidazole

Interactions
Phenobarbital may alter Phenobarbital levels

Storage
Locked medicine cupboard

Side Effects
Respiratory depression
Hypotonia
Abnormal liver function tests
Hypersalivation and increased bronchial secretions
<table>
<thead>
<tr>
<th><strong>Contra-indications</strong></th>
<th>None known</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Other</strong></td>
<td>Optimum blood level 15 to 80 nanograms/mL</td>
</tr>
</tbody>
</table>

1. Evans & Levene Arch Dis Child 1998;78:F70-5
# Curosurf (Poractant)

Natural surfactant extracted from porcine lung

## Indications for use
Respiratory distress syndrome

## Preparation
1.5 mL vial containing 120 mg of phospholipid

## Administration

<table>
<thead>
<tr>
<th>Dosage</th>
<th>100 mg/kg</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2 further doses may be given at approximately 12 hourly intervals</td>
</tr>
</tbody>
</table>

### Routes
- Intra-tracheal

### Compatibility

### Incompatibility

### Interactions

## Storage
Locked refrigerator at 2° to 8° C

## Side Effects
- Pulmonary haemorrhage
- Rapid change in oxygenation and lung compliance

## Contra-indications
None known

## Other
- Must be warmed to 37° C before use and gently turned upside down, without shaking, to obtain a uniform suspension. Warmed vials should not be returned to the refrigerator
- Oxygen saturation and inspired oxygen concentration must be closely monitored following administration until oxygen requirements have stabilised
## Cyclopentolate eye drops

**Antimuscarinic agent**

### Indications for use
- Mydriasis prior to ophthalmic examination

### Preparation
- 0.5% Minims
- Administered in conjunction with phenylephrine eye drops

### Administration

<table>
<thead>
<tr>
<th>Dosage</th>
<th>1 drop to each eye every 20 minutes starting 1 hour before examination is due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Routes</td>
<td>Eyes</td>
</tr>
</tbody>
</table>

### Compatibility

### Incompatibility

### Interactions

### Storage
- Locked medicine cabinet

### Side Effects
- Local reaction
- Oedema
- Conjunctivitis
- Allergic reactions

### Contra-indications
- None known

### Other
- Effects may last for 24 hours
# Dexamethasone

Glucocorticoid

## Indications for use

- Chronic lung disease of prematurity
- Weaning from a ventilator
- Laryngeal/subglottic stenosis
- Hypotension unresponsive to vasopressors and volume expansion

## Preparation

- 4 mg in 1 mL vial
- 0.4 mg in 1 mL oral solution

## Administration

### Dosage

**Treatment of lung disease and weaning from ventilator**
- 0.15 mg/kg/day for 3 days
- 0.10 mg/kg/day for 3 days
- 0.05 mg/kg/day for 2 days
- 0.02 mg/kg/day for 2 days

**Subglottic stenosis**
- 0.6 mg/kg maximum first dose then
- 0.2 mg/kg 8 hourly for 2 days

**Resistant hypotension**
- 0.25 mg/kg - single dose

### Routes

- IV over 1 minute
- Oral
- IO

### Compatibility

- Glucose 5%
- Glucose 10%
- Glucose 4.0% / sodium chloride 0.18%
- Sodium chloride 0.9%
**Incompatibility**

- Amphotericin
- Metronidazole
- Midazolam
- Vancomycin

**Interactions**

- Barbiturates: decreased efficacy of dexamethasone
- Phenytoin: decreased efficacy of dexamethasone

**Storage**

Locked medicine cupboard

**Side Effects**

- Hypertension
- Gastrointestinal bleeding
- Hyperglycaemia
- Impaired wound healing
- Adrenal suppression
- Sodium retention
- Hypokalaemia
- Impaired resistance to infection
- Fluid retention
- Increased risk of fungal infection
- Impaired growth
- Irritability

**Contra-indications**

None known

**Other**

Monitor blood pressure and blood glucose throughout treatment

With prolonged courses consider slow reduction of dose

If parenteral nutrition is commenced, ranitidine must be prescribed to reduce risk of gastric bleeding

In light of current controversy over association between postnatal dexamethasone and subsequent cerebral palsy, dexamethasone should only be prescribed following discussion with the parents and may only be initiated by a member of the consultant staff.  

---

Digoxin

Cardiac glycoside which increases the force of contraction of the myocardium and reduces the conductivity of the heart

Indications for use
Heart failure
Dysrhythmias

Preparation
250 micrograms in 1 mL injection (2 mL ampoule)
Take 1 mL of concentrated solution and add to 9 mL of glucose 5% or sodium chloride 0.9% to give a solution of 25 micrograms in 1 mL
50 micrograms in 1 mL elixir

Administration

Dosage
Infant < 1.5 kg

Loading dose
25 micrograms/kg/day in 3 divided doses over 24 hours

Maintenance dose
4 to 6 micrograms/kg/day in 1 or 2 divided doses

Infant 1.5 to 2.5 kg

Loading dose
30 micrograms/kg/day in 3 divided doses over 24 hours

Maintenance dose
4 to 6 micrograms/kg/day in 1 or 2 divided doses

Infant > 2.5 kg

Loading dose
45 micrograms/kg/day in 3 divided doses over 24 hours

Maintenance dose
10 micrograms/kg/day in 1 or 2 divided doses

Routes
IV infusion over 30 minutes
Oral

Compatibility
Glucose 5%
Sodium chloride 0.9%
## Incompatibility
- Amphotericin
- Fluconazole
- Insulin
- Metronidazole

## Interactions
- Captopril: digoxin levels may rise
- Erythromycin: digoxin levels may be markedly elevated

## Storage
- Locked medicine cupboard

## Side Effects
- Vomiting
- Arrhythmias
- Bradycardia
- Convulsions
- Thrombocytopenia
- Hyperkalaemia

## Contra-indications
- None absolute

## Other
- Hypokalaemia potentiates action

Monitor levels. Samples should be collected 6 hours after the first maintenance dose, then repeated as appropriate. Levels may not stabilise for 10 days.

Therapeutic range 0.9 to 2 micrograms/L

Half life in the newborn infant is 2 to 4 days.
Diphtheria, tetanus, acellular pertussis, inactivated poliomyelitis and haemophilus type B conjugated vaccine

Vaccine contains diphtheria toxoid, tetanus toxoid, pertussis toxoid, inactivated polio virus type 1, 2 & 3, and haemophilus influenzae type B polysaccharide

**Indications for use**
Active vaccine for protection against diphtheria, tetanus, pertussis, poliomyelitis and haemophilus influenzae type B infection
To be administered at 2 months, 3 months and 4 months from birth

**Preparation**
Suspension for injection

**Administration**

<table>
<thead>
<tr>
<th>Dosage</th>
<th>0.5 mL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Routes</td>
<td>Intra-muscular injection</td>
</tr>
</tbody>
</table>

**Compatibility**

**Incompatibility**

**Interactions**

**Storage**
Locked refrigerator at 2° to 8° C
### Side Effects
- Bradycardia
- Apnoea
- Pain
- Local reaction
- Fever
- Malaise
- Irritability
- Convulsions
- Cyanosis
- Encephalopathy
- Anaphylaxis
- Bronchospasm

### Contra-indications
- Hypersensitivity to any vaccine component

  If severe reaction occurs specialist advice should be sought regarding further pertussis immunisation

  An evolving neurological condition is a contra-indication to pertussis immunisation

### Other
- The recommended injection site for infants is the anterior-lateral thigh. May be administered at the same time as meningococcal C vaccine, pneumococcal vaccine or hepatitis B vaccine. However injections should be given into separate sites

  Injection should be postponed if the patient has an acute, severe, febrile illness

  IM injections should be given with care in babies with thrombocytopenia or bleeding disorders due to the risk of haemorrhage

  Consent form necessary

  Community Health Sheffield must be notified after vaccine has been administered
Dobutamine

Sympathomimetic
Stimulates cardiac beta-receptors and increases contractility
Little peripheral vascular effect

Indications for use
Treatment of hypotension

Preparation
12.5 mg in 1 mL concentrated solution
Must be diluted before use

Administration

Dosage
2 to 20 micrograms/kg/minute

Standard infusion
Add 4.8 mL of Dobutamine 12.5 mg in 1 mL to 45.2 mL of glucose 5% or sodium chloride 0.9% to produce a final concentration of 1.2 mg in 1 mL
DoBUTam 1200mcg/ml
60 mg/50 ml (1.2 mg/ml)

Concentrated infusion
Add 9.6 mL of Dobutamine 12.5 mg in 1 mL to 40.4 mL of glucose 5% or sodium chloride 0.9% to produce a final concentration of 2.4 mg in 1 mL
DoBUTam 2400mcg/ml
120 mg/50 ml (2.4 mg/ml)

Maximum concentration should not be more than 5 mg in 1 mL

Routes
IV infusion
IO

Compatibility
Dopamine
Glucose 5%
Sodium chloride 0.9%
### Incompatibility
- Aciclovir
- Aminophylline
- Amphotericin
- Calcium salts
- Diazepam
- Furosemide
- Heparin
- Indometacin
- Magnesium sulphate
- Metronidazole
- Midazolam
- Phenytoin
- Potassium chloride
- Sodium bicarbonate
- Trometamol

### Interactions

### Storage
- Locked medicine cupboard
- Diluted solutions are stable for 24 hours

### Side Effects
- Local reaction
- Pulmonary hypertension
- Arrhythmias
- Tachycardia
- Extravasation may cause tissue necrosis

### Contra-indications
- None known

### Other
- Monitor blood pressure and heart rate
- Peripheral vasodilatation may occur and hypotension can result
# Domperidone

Dopamine receptor antagonist, which stimulates gastric emptying and small intestine transit time.

## Indications for use
- Gastric stasis
- Severe gastro-oesophageal reflux resistant to other measures

## Preparation
- 1 mg in 1 mL oral suspension

## Administration

<table>
<thead>
<tr>
<th>Dosage</th>
<th>100 to 300 micrograms/kg 4 to 6 hourly before feeds</th>
<th>200 to 400 micrograms/kg 4 to 6 hourly before feeds</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 28 days</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;28 days</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Route**
- Oral

## Compatibility

## Incompatibility

## Interactions
- Opioid analgesic: Antagonises domperidone
- Erythromycin: Prolonged QT interval

## Storage
- Locked medicine cupboard

## Side Effects
- Gastrointestinal disturbances
- Extrapyramidal effects
- Rashes

## Contra-indications
- Not recommended for chronic administration

## Other
- MFC recommends ECG prior to starting then at regular intervals, but this is not mentioned elsewhere

*To stimulate lactation in mothers*
- Recommended dose: 10 to 20 mg 3 to 4 times daily
- Must be prescribed by mother’s doctor not paediatrician
Dopamine

Sympathomimetic
At doses below 8 to 10 micrograms/kg/min dopamine increases blood pressure by a direct and indirect inotropic and beta-adrenergic effect on the heart. At higher doses, an alpha-adrenergic effect dominates and there is increasing vasoconstriction in all vascular beds. Low dose dopamine is often referred to as a 'renal dose' because of alleged renal vasodilatation through dopaminergic action. There is little evidence to support this and a renal action is strongly disputed by many authorities.

### Indications for use
- Hypotension

### Preparation
- 40 mg in 1 mL
- Must be diluted before use

### Administration

#### Dosage
- 2 to 20 micrograms/kg/minute

**Standard infusion**
- Add 1.5 mL of dopamine 40 mg in 1 mL to 48.5 mL of glucose 5% or sodium chloride 0.9% to produce a final concentration of 1.2 mg in 1 mL
- DOPamine 1200mcg/ml
  - 60 mg/50 ml (1.2 mg/ml)

**Concentrated infusion**
- Add 3 mL of dopamine 40 mg in 1 mL to 47 mL of glucose 5% or sodium chloride 0.9% to produce a final concentration of 2.4 mg in 1 mL
- DOPamine 2400mcg/ml
  - 120 mg/50 ml (2.4 mg/ml)

#### Routes
- IV infusion. Preferably given into a large vein or central line

#### Compatibility
- Dobutamine
- Glucose 5%
- Sodium chloride 0.9%
Incompatibility
Aciclovir
Amphotericin
Furosemide
Indometacin
Insulin
Metronidazole
Sodium bicarbonate
Trometamol

Interactions

Storage
Locked medicine cupboard
Diluted solutions are stable for 24 hours

Side Effects
Extravasation may cause tissue necrosis
Bradycardia
Local reaction
Pulmonary hypertension
Arrhythmias
Tachycardia

Contra-indications
None absolute

Other
Monitor blood pressure and heart rate
If urine output falls, dosage should be reduced
# Dornase Alfa

Genetically engineered human enzyme

## Indications for use
- Reduction of sputum viscosity
- Mucus plug

## Preparation
- 1000 units (1 mg) in 1 mL
- Add 2.5 mL of dornase alfa to 7.5 mL sodium chloride 0.9% to produce a final concentration of 250 units (0.25 mg) in 1 mL

## Administration

<table>
<thead>
<tr>
<th>Dosage</th>
<th>250 units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Route</td>
<td>ET</td>
</tr>
</tbody>
</table>

## Storage
- Locked refrigerator

## Side Effects
- Chest pain
- Rashes
- Urticaria
- Conjunctivitis

## Contra-indications

## Other
- Put the baby on the affected side if appropriate, administer the dornase alfa. After 45 to 60 minutes perform physiotherapy and suction

---

# Doxapram

**Respiratory stimulant**

## Indications for use
- Treatment of respiratory depression where severe apnoea is refractory to caffeine

## Preparation
- **20 mg in 1 mL ampoule**
- Add 5 mL of doxapram 20 mg in 1 mL to 15 mL glucose 5% to produce a final concentration of 5 mg in 1 mL

## Administration

<table>
<thead>
<tr>
<th><strong>Dosage</strong></th>
<th><strong>Loading:</strong> 2.5 mg/kg</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Maintenance:</strong></td>
<td>0.5 to 1 mg/kg/hour</td>
</tr>
<tr>
<td>maximum</td>
<td>1.5 mg/kg/hour</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Routes</strong></th>
<th>IV bolus over 5 minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV infusion</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Compatibility</strong></th>
<th>Glucose 5%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glucose 10%</td>
<td></td>
</tr>
<tr>
<td>Sodium chloride 0.9%</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Incompatibility</strong></th>
<th>Aminophylline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cefotaxime</td>
<td></td>
</tr>
<tr>
<td>Dexamethasone</td>
<td></td>
</tr>
<tr>
<td>Furosemide</td>
<td></td>
</tr>
<tr>
<td>Hydrocortisone sodium phosphate</td>
<td></td>
</tr>
<tr>
<td>Sodium bicarbonate</td>
<td></td>
</tr>
</tbody>
</table>

| **Interactions** | Aminophylline - causing agitation and increased skeletal muscle activity |

<table>
<thead>
<tr>
<th><strong>Storage</strong></th>
<th>Locked medicine cupboard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diluted solutions are stable for 24 hours</td>
<td></td>
</tr>
<tr>
<td><strong>Side Effects</strong></td>
<td>Extravasation can cause tissue necrosis</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>-----------------------------------------</td>
</tr>
<tr>
<td></td>
<td>Hepatic dysfunction</td>
</tr>
<tr>
<td></td>
<td>Tachycardia</td>
</tr>
<tr>
<td></td>
<td>Convulsions</td>
</tr>
<tr>
<td></td>
<td>Laryngospasm</td>
</tr>
<tr>
<td></td>
<td>Hiccups</td>
</tr>
<tr>
<td></td>
<td>Hypertension</td>
</tr>
<tr>
<td></td>
<td>Hyperventilation</td>
</tr>
<tr>
<td></td>
<td>Sweating</td>
</tr>
<tr>
<td></td>
<td>Bronchospasm</td>
</tr>
<tr>
<td></td>
<td>Arrhythmias</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Contra-indications</strong></th>
<th>Patients with epilepsy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cerebral oedema</td>
</tr>
<tr>
<td></td>
<td>Physical obstruction of airway</td>
</tr>
<tr>
<td></td>
<td>Severe hypotension</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Other</strong></th>
<th></th>
</tr>
</thead>
</table>
**Enoxaparin**

Low molecular weight heparin

<table>
<thead>
<tr>
<th><strong>Indications for use</strong></th>
<th>To prolong clotting time following thrombosis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Preparation</strong></td>
<td>100 mg in 1 mL (10,000 units in 1 mL)</td>
</tr>
<tr>
<td><strong>Administration</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Dosage</strong></td>
<td>1.5 to 2 mg/kg 12 hourly adjusted to achieve an anti-factor Xa level of 0.5 to 1 unit/mL</td>
</tr>
<tr>
<td><strong>Routes</strong></td>
<td>SC</td>
</tr>
<tr>
<td><strong>Compatibility</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Incompatibility</strong></td>
<td>All other drugs</td>
</tr>
<tr>
<td><strong>Interactions</strong></td>
<td>Indomethacin prolonged bleeding (particularly gastric bleeding)</td>
</tr>
<tr>
<td><strong>Storage</strong></td>
<td>Locked medicine cupboard</td>
</tr>
<tr>
<td><strong>Side Effects</strong></td>
<td>Haemorrhage Thrombocytopenia Pain Haematoma Local reaction Suppressed adrenal secretion of aldosterone</td>
</tr>
<tr>
<td><strong>Contra-indications</strong></td>
<td>Acute bacterial endocarditis Major bleeding disorders Thrombocytopenia Active gastric or duodenal ulceration Recent intracranial haemorrhage</td>
</tr>
</tbody>
</table>
### Other

*Monitor anti-factor Xa levels 4 hours after dose given*  

<table>
<thead>
<tr>
<th>Anti-factor Xa level (U/mL)</th>
<th>Dosage adjustment</th>
<th>Next anti-factor Xa level</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 0.35</td>
<td>↑ next dose by 25%</td>
<td>4 hr following dosage adjustment</td>
</tr>
<tr>
<td>0.35-0.49</td>
<td>↑ next dose by 10%</td>
<td>4 hr following dosage adjustment</td>
</tr>
<tr>
<td>0.50-1</td>
<td>No change</td>
<td>Weekly 4 hr following a dose. If change in renal function, addition of antibiotics, signs of bleeding, check level 4 hr after next dose</td>
</tr>
<tr>
<td>1.1-1.3</td>
<td>↓ next dose by 20%</td>
<td>Before next dose and 4 hr following dosage adjustment</td>
</tr>
<tr>
<td>1.4-2</td>
<td>Withhold dose until anti-factor Xa level &lt;1, then ↓ next dose by 30%</td>
<td>4 hr following dosage adjustment</td>
</tr>
<tr>
<td>&gt;2</td>
<td>Withhold dose until anti-factor Xa level &lt;0.5, then ↓ next dose by 40%</td>
<td>Every 12 hr until anti-factor Xa level &lt;0.5, then 4 hr following reinstitution of therapy</td>
</tr>
</tbody>
</table>

**Overdose - reversal of effect**

1 mg Protamine may reverse the effect of 1 mg enoxaparin but the exact dose equivalent is uncertain

---

**Erythromycin**

Broad spectrum antibiotic

### Indications for use

- Infection with sensitive organism resistant to the usual first and second line antibiotics
- To decrease gastric emptying time

### Preparation

1 g vial of dry powder

Add 20 mL of water to 1 g vial, to produce a final volume of 22 mL. There is a deliberate excess of drug in the vial to give a concentration of 50 mg in 1 mL. Take 1 mL of this solution and add to 9 mL of sodium chloride 0.9% to produce a final concentration of 5 mg in 1 mL

25 mg in 1 mL oral suspension

### Administration

**Dosage**

- 10 mg/kg 6 hourly

  *Prokinetic dose*

  - 3 mg/kg 6 hourly

**Routes**

- IV infusion over 60 minutes
- Oral

**Compatibility**

- Glucose 4.0% / sodium chloride 0.18%
- Sodium chloride 0.9%
- Parenteral nutrition – clear fluids

**Incompatibility**

- Amphotericin
- Fluconazole
- Gentamicin
- Metronidazole
Interactions

Cimetidine  increased risk of toxicity
Cisapride  prolonged Q-T interval
Digoxin  levels may be markedly elevated
Midazolam  increased midazolam levels
Theophylline  levels elevated

Storage
Locked refrigerator at 2° to 8° C

Side Effects
Local reaction
Impaired hearing
Gastrointestinal disturbance
Vomiting
Diarrhoea
Arrhythmias
Cholestatic jaundice

Contra-indications
Caution in hepatic impairment

Other
Intravenous injection can be very painful, use only if unavoidable

The current evidence has not provided conclusive evidence that erythromycin has a meaningful therapeutic role in feeding intolerance 2

2 Ng E, Shah V. Erythromycin for feeding intolerance in preterm infants (Cochrane Review). In: The Cochrane Library, Issue 3, 2004
## Erythropoietin

Glycosylated protein hormone and haemopoietic growth factor secreted by the kidneys

<table>
<thead>
<tr>
<th>Indications for use</th>
<th>Anaemia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparation</td>
<td>Syringes prepared in pharmacy</td>
</tr>
<tr>
<td>Administration</td>
<td></td>
</tr>
<tr>
<td><strong>Dosage</strong></td>
<td>400 units/kg 3 times per week for at least 3 weeks</td>
</tr>
<tr>
<td><strong>Routes</strong></td>
<td>SC</td>
</tr>
<tr>
<td><strong>Compatibility</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Incompatibility</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Interactions</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Storage</strong></td>
<td>Locked refrigerator at 2° to 8° C</td>
</tr>
<tr>
<td><strong>Side Effects</strong></td>
<td>Hypertension</td>
</tr>
<tr>
<td><strong>Contra-indications</strong></td>
<td>Uncontrolled hypertension</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>Iron status must be evaluated and supplements prescribed when indicated</td>
</tr>
<tr>
<td></td>
<td>In clinical trials Erythropoietin has been given for up to 6 weeks</td>
</tr>
<tr>
<td><strong>Fentanyl</strong></td>
<td></td>
</tr>
<tr>
<td>-------------</td>
<td></td>
</tr>
<tr>
<td>Opioid analgesic</td>
<td></td>
</tr>
</tbody>
</table>

**Indications for use**
- Analgesia

**Preparation**
- 10 micrograms in 1 mL

**Administration**

<table>
<thead>
<tr>
<th><strong>Dosage</strong></th>
<th>3 to 5 micrograms/kg/single dose reduced to 1 microgram/kg/single dose for subsequent doses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Continuous infusion</strong></td>
<td>1 microgram/kg/hour increasing to a maximum of 3 micrograms/kg/hour</td>
</tr>
</tbody>
</table>

Add 2 mL of fentanyl 10 micrograms in 1 mL to 6 mL of glucose 5% or sodium chloride 0.9% to produce a final concentration of 2.5 micrograms in 1 mL
- FENtanyl 2.5mcg/ml |
- 20 µg/8 ml (2.5 µg/ml)

**Chest drain or Premedication prior to intubation**
- Not intubated - 2.5 micrograms/kg
- Intubated - 5 micrograms/kg
- All infants should have local infiltration with 1% lidocaine

**Routes**
- IV bolus over 2 minutes
- Infusion

**Compatibility**
- Glucose 5%
- Sodium chloride 0.9%
- Dopamine
- Dobutamine
- Parenteral nutrition - clear fluids

**Incompatibility**
<table>
<thead>
<tr>
<th>Interactions</th>
<th>Morphine</th>
<th>increased side effects</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Domperidone</td>
<td>reduced gastrointestinal effects</td>
</tr>
<tr>
<td></td>
<td>Metoclopramide</td>
<td>reduced gastrointestinal effects</td>
</tr>
<tr>
<td></td>
<td>Cisapride</td>
<td>reduced gastrointestinal effects</td>
</tr>
<tr>
<td></td>
<td>Anxiolytics and hypnotics</td>
<td>enhanced sedative effects</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Storage</th>
<th>Controlled drug cupboard</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Side Effects</th>
<th>Respiratory depression</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hypotension</td>
</tr>
<tr>
<td></td>
<td>Hypertension</td>
</tr>
<tr>
<td></td>
<td>Nausea</td>
</tr>
<tr>
<td></td>
<td>Vomiting</td>
</tr>
<tr>
<td></td>
<td>Constipation</td>
</tr>
<tr>
<td></td>
<td>Urinary retention</td>
</tr>
<tr>
<td></td>
<td>Bradycardia</td>
</tr>
<tr>
<td></td>
<td>Sweating</td>
</tr>
<tr>
<td></td>
<td>Hypothermia</td>
</tr>
<tr>
<td></td>
<td>Urticaria</td>
</tr>
<tr>
<td></td>
<td>Chest wall rigidity</td>
</tr>
<tr>
<td></td>
<td>Jaw muscle rigidity</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Contra-indications</th>
<th>Use with caution</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Other</th>
<th>Repeated doses or continuous infusion may result in accumulation, increasing the risk of prolonged respiratory depression</th>
</tr>
</thead>
</table>
Flecainide

Class I C anti-arrhythmic

Indications for use
Severe symptomatic ventricular arrhythmias
Severe symptomatic supra-ventricular arrhythmias

Preparation
Injection 10 mg in 1 mL
Oral suspension 5 mg in 1 mL

Administration

Dosage
Oral 2.5 mg/kg 8 hourly
IV 1 to 2 mg/kg/dose over 10 minutes followed by infusion of
100 to 250 micrograms/kg/hour
Add 1 mL of Flecainide 10 mg in 1 mL to 49 mL of glucose 5% to
produce a final concentration of 200 micrograms in 1 mL
FLEcainide200mcg/ml
10 mg/50 ml (0.2 mg/ml)

Routes
Oral
IV infusion over 15 minutes
IV infusion continuous

Compatibility
Glucose 5%

Incompatibility
Sodium chloride 0.9%
All other drugs

Interactions
Digoxin levels increase slightly
Beta blockers - enhanced negative inotrope effects
Cimetidine increases flecainide levels and prolongs half life
Amiodarone increases flecainide levels, dose should be reduced by
50%
Propanolol increase plasma levels of both drugs

Storage
Locked medicine cupboard
<table>
<thead>
<tr>
<th><strong>Side Effects</strong></th>
<th>Pro-arrhythmic effects</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Photosensitivity</td>
</tr>
<tr>
<td></td>
<td>Allergic reactions</td>
</tr>
<tr>
<td></td>
<td>Nausea</td>
</tr>
<tr>
<td></td>
<td>Vomiting</td>
</tr>
<tr>
<td></td>
<td>Jaundice</td>
</tr>
<tr>
<td></td>
<td>Abnormal liver function tests</td>
</tr>
</tbody>
</table>

| **Contra-indications** | Cardiac failure            |

<table>
<thead>
<tr>
<th><strong>Other</strong></th>
<th>Correct electrolyte disturbance before use</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Do not use if significant hepatic impairment unless the benefits outweigh the risks</td>
</tr>
<tr>
<td></td>
<td>Monitor plasma levels</td>
</tr>
<tr>
<td></td>
<td>Would normally be initiated following consultation with paediatric cardiologist</td>
</tr>
</tbody>
</table>
Flucloxacillin

Antibiotic

Indications for use
Infections due to Gram +ve organisms particularly staphylococci
Second line antibiotic for suspected sepsis

Preparation
500 mg vial of dry powder
To reconstitute add 9.6 mL of water for injections to 500 mg vial (displacement value 0.4 mL) to produce a final concentration of 50 mg in 1 mL
25 mg in 1 mL oral syrup

Administration

Dosage

<table>
<thead>
<tr>
<th>Condition</th>
<th>Dosage</th>
<th>Administration</th>
</tr>
</thead>
</table>
| **Minor infections**                                | 50 mg/kg | 12 hourly if <7 days  
6 hourly if >21 days |
|                                                     | 25 mg/kg | 12 hourly if <7 days  
8 hourly if 7 to 21 days  
6 hourly if >21 days |
| **Staphylococcal osteomyelitis, meningitis and cerebral abscess** | 100 mg/kg | 12 hourly if <7 days  
8 hourly if 7 to 21 days  
6 hourly if >21 days |

Routes
IV bolus over 1 minute
Oral

Compatibility
Glucose 5%
Glucose 10%
Glucose 4.0% / sodium chloride 0.18%
Sodium chloride 0.9%

Incompatibility
Amphotericin
Metronidazole
Midazolam

Interactions
<table>
<thead>
<tr>
<th><strong>Storage</strong></th>
<th>Locked refrigerator at 2° to 8° C</th>
</tr>
</thead>
</table>
| **Side Effects** | Local reaction  
Gastrointestinal disturbance  
Rash  
Cholestatic jaundice  
Hepatic dysfunction |
| **Contra-indications** | None known |
| **Other** |  |
Fluconazole

Antifungal agent

Indications for use
Systemic candidiasis and cryptococcal meningitis

Preparation
2 mg in 1 mL solution for IV infusion
10 mg in 1 mL oral suspension

Administration

Dosage
6 to 12 mg/kg
72 hourly if <14 days
48 hourly if 14 to 28 days
24 hourly if >28 days

For at least 6 to 8 weeks for cryptococcal meningitis

Routes
IV infusion over 30 minutes
Oral

Compatibility
Glucose 5%
Glucose 10%
Glucose 4.0% / sodium chloride 0.18%
Sodium chloride 0.9%

Incompatibility
Amphotericin
Amoxicillin
Calcium salts
Cefotaxime
Ceftazidime
Digoxin
Erythromycin
Furosemide
Metronidazole
Tazocin

Interactions
Caffeine increased caffeine levels
Phenytoin increased phenytoin levels
<table>
<thead>
<tr>
<th><strong>Storage</strong></th>
<th>IV</th>
<th>Locked medicine cupboard</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Oral</td>
<td>Locked refrigerator</td>
</tr>
<tr>
<td><strong>Side Effects</strong></td>
<td></td>
<td>Abnormal liver function tests</td>
</tr>
<tr>
<td><strong>Contra-indications</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Flucytosine

**Antifungal agent**

## Indications for use
- Systemic yeast and fungal infections

## Preparation
- 10 mg in 1 mL

## Administration

<table>
<thead>
<tr>
<th>Dosage</th>
<th>Frequency</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 mg/kg</td>
<td>12 hourly if &lt; 28 days, 6 hourly if &gt; 28 days</td>
<td>For at least 4 months for cryptococcal meningitis</td>
</tr>
</tbody>
</table>

**Routes**
- Infusion over 30 minutes
  - *must be infused through a 15 micron filter*

## Compatibility
- Glucose 5%
- Glucose 4.0% / sodium chloride 0.18%
- Sodium chloride 0.9%

## Incompatibility
- Amphotericin
- Metronidazole

## Interactions

## Storage
- Locked medicine cupboard
- Do not store in the refrigerator

## Side Effects
- Nausea
- Sedation
- Vomiting
- Drowsiness
- Diarrhoea
- Rash
- Convulsions
- Thrombocytopenia
- Aplastic anaemia
- Leucopenia
- Hepatic dysfunction
<table>
<thead>
<tr>
<th><strong>Contra-indications</strong></th>
<th>None known</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Other</strong></td>
<td>Close monitoring of liver function and haematology essential</td>
</tr>
<tr>
<td></td>
<td>May be given with amphotericin in severe fungal infections</td>
</tr>
</tbody>
</table>
# Flumazenil

Benzodiazepine antagonist which acts competitively at CNS benzodiazepine receptors

## Indications for use
Reversal of benzodiazepine effects

## Preparation
Injection 100 micrograms in 1 mL. 5 mL ampoules

## Administration

<table>
<thead>
<tr>
<th>Dosage</th>
<th>Route</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV bolus</td>
<td>10 micrograms/kg/single dose</td>
<td>This dose can be repeated once if required</td>
</tr>
<tr>
<td>IV infusion</td>
<td>10 micrograms/kg/hour</td>
<td></td>
</tr>
</tbody>
</table>

**Compatibility**
- Glucose 5%
- Sodium chloride 0.9%

**Incompatibility**

**Interactions**

**Storage**
Locked medicine cupboard

**Side Effects**
- Nausea
- Vomiting
- Flushing
- Convulsions
- Hypertension

**Contra-indications**

**Other**
- Half life is shorter than half life of benzodiazepines, therefore further doses may be required
# Folic acid

A member of the vitamin B group essential for DNA synthesis

## Indications for use
Infants with increased erythropoiesis

## Preparation
500 micrograms in 1 mL oral solution

## Administration

<table>
<thead>
<tr>
<th>Dosage</th>
<th>500 micrograms independent of weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Routes</td>
<td>Oral</td>
</tr>
</tbody>
</table>

## Storage
Locked medicine cupboard

## Side Effects

## Contra-indications
None known

## Other
# Furosemide (Frusemide)

## Loop diuretic

### Indications for use
- Fluid retention and reduced renal output
- Heart failure
- Chronic lung disease
- Hypertension

### Preparation
- 10 mg in 1 mL injection
- 1 mg in 1 mL oral solution

### Administration

<table>
<thead>
<tr>
<th>Dosage</th>
<th>Routes</th>
<th>Compatibility</th>
<th>Incompatibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 mg/kg</td>
<td>IV bolus over 3 minutes</td>
<td>Glucose 5%</td>
<td>Amphotericin</td>
</tr>
<tr>
<td>24 hourly if &lt; 31 weeks gestational age</td>
<td>Oral</td>
<td>Glucose 10%</td>
<td>Dobutamine</td>
</tr>
<tr>
<td>12 to 24 hourly if ≥ 31 weeks gestational age</td>
<td></td>
<td>Sodium chloride 0.9%</td>
<td>Dopamine</td>
</tr>
<tr>
<td>Higher doses in renal impairment</td>
<td></td>
<td></td>
<td>Fluconazole</td>
</tr>
<tr>
<td>Allow at least 2 hours between doses</td>
<td></td>
<td></td>
<td>Gentamicin</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Metronidazole</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Midazolam</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Morphine sulphate</td>
</tr>
</tbody>
</table>
**Interactions**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACE inhibitors</td>
<td>severe hypotension</td>
</tr>
<tr>
<td>Atracurium</td>
<td>duration and depth of block may be increased</td>
</tr>
<tr>
<td>Cefotaxime</td>
<td>nephrotoxicity</td>
</tr>
<tr>
<td>Chloral</td>
<td>sweating, hot flushes, unstable blood pressure, tachycardia</td>
</tr>
<tr>
<td>Gentamicin</td>
<td>nephrotoxicity and ototoxicity</td>
</tr>
</tbody>
</table>

**Storage**

Locked medicine cupboard

**Side Effects**

- Hyponatraemia
- Hypokalaemia
- Hypocalcaemia
- Nephrocalcinosis
- Hypochloraeemic alkalosis
- Hyperuricaemia
- Gastrointestinal disturbance
- Rash
- Impaired hearing

**Contra-indications**

None known

**Other**

May displace bilirubin from albumin
Gaviscon

Reacts with gastric acid to form a viscous gel which floats on top of gastric contents

Acts as a mechanical barrier to reduce reflux

Indications for use

Gastro-oesophageal reflux

Preparation

White powder in individual doses

Administration

Dosage

Dissolve 1 dose (one of the two in a dual sachet) of gaviscon in 5 mL of sterile water

Breastfed babies:
Administer gaviscon after a feed

Bottle fed babies:
Use the table below to calculate the amount of gaviscon required to be added to a feed

<table>
<thead>
<tr>
<th>Volume of milk (mL)</th>
<th>Gaviscon solution to be added (mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>5.0</td>
</tr>
<tr>
<td>90</td>
<td>4.5</td>
</tr>
<tr>
<td>80</td>
<td>4.0</td>
</tr>
<tr>
<td>70</td>
<td>3.5</td>
</tr>
<tr>
<td>60</td>
<td>3.0</td>
</tr>
<tr>
<td>50</td>
<td>2.5</td>
</tr>
<tr>
<td>40</td>
<td>2.0</td>
</tr>
<tr>
<td>30</td>
<td>1.5</td>
</tr>
<tr>
<td>20</td>
<td>1.0</td>
</tr>
<tr>
<td>10</td>
<td>0.5</td>
</tr>
</tbody>
</table>

Having added the gaviscon to the feed any unused milk must be stored in the refrigerator and must be used within 12 hours

In the home, reconstituted gaviscon must be used immediately and not stored

Routes

Oral

Compatibility

Incompatibility

Other feed thickening agents
Infant milk preparations containing a thickening agent
<table>
<thead>
<tr>
<th>Interactions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Storage</strong></td>
</tr>
<tr>
<td>Locked medicine cupboard</td>
</tr>
<tr>
<td><strong>Side Effects</strong></td>
</tr>
<tr>
<td>Abdominal distension</td>
</tr>
<tr>
<td>Hypernatraemia</td>
</tr>
<tr>
<td>Intragastric masses</td>
</tr>
<tr>
<td><strong>Contra-indications</strong></td>
</tr>
<tr>
<td>Nil by mouth</td>
</tr>
<tr>
<td>Intestinal obstruction</td>
</tr>
<tr>
<td>Established diarrhoea</td>
</tr>
<tr>
<td>Vomiting</td>
</tr>
<tr>
<td>Gastroenteritis</td>
</tr>
<tr>
<td>Dehydration</td>
</tr>
<tr>
<td><strong>Other</strong></td>
</tr>
<tr>
<td>Prepare immediately before use</td>
</tr>
<tr>
<td>1 dose contains 0.92 mmol/L of sodium</td>
</tr>
</tbody>
</table>
Gentamicin

Aminoglycoside antibiotic

Indications for use
Infections due to Gram -ve organisms and some staphylococci

Preparation
Normally supplied from pharmacy prediluted to 4 mg in 1 mL
(Stock solution = 40 mg in 1 mL)

Administration

Dosage
Corrected gestational age

≤ 28^{*0} weeks  4 mg/kg 36 hourly

> 28^{*0} weeks  4 mg/kg 24 hourly

Dose must be adjusted on the basis of frequent blood levels

Routes
IV bolus over 3 minutes

Compatibility
Glucose 5%
Glucose 10%
Glucose 4.0% / sodium chloride 0.18%
Parenteral nutrition - clear fluids
Sodium chloride 0.9%

Incompatibility
Amphotericin
Amoxicillin
Cephalosporins
Erythromycin
Furosemide
Heparin
Indometacin
Phenytoin
Tazocin

Interactions
Atracurium  duration and depth of block may be increased
Furosemide  ototoxicity
Vancomycin  ototoxicity and nephrotoxicity

Storage
Locked medicine cupboard
| Side Effects | Hearing damage  
Renal impairment |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Contra-indications</td>
<td>Renal failure</td>
</tr>
<tr>
<td>Other</td>
<td>Monitor levels at second dose if $\leq 28^{\circ}$ weeks and third dose if $&gt; 28^{\circ}$ weeks</td>
</tr>
<tr>
<td></td>
<td>Peak levels 60 minutes after dose</td>
</tr>
</tbody>
</table>
| | Trough: 0.5 to 1 microgram/mL  
Peak: 5 to 10 micrograms/mL |
| | In a newborn infant levels must be repeated frequently as renal function is changing. In an older infant in whom renal function is normal, levels can be measured less frequently (every 3-5 days) |
| | If antibiotics are likely to be stopped after the third dose, levels may be delayed until the fourth dose if a prolonged course is found to be necessary |

### Glucose gel (Hypostop)

40% glucose gel

<table>
<thead>
<tr>
<th>Indications for use</th>
<th>Hypoglycaemia when intravenous access not available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparation</td>
<td>40% gel (40 grams/100 mL)</td>
</tr>
<tr>
<td>Administration</td>
<td></td>
</tr>
<tr>
<td>Dosage</td>
<td>Single dose</td>
</tr>
<tr>
<td>Squeeze as much as possible into the mouth without compromising the airway</td>
<td></td>
</tr>
<tr>
<td>Routes</td>
<td>Oral</td>
</tr>
<tr>
<td>Compatibility</td>
<td></td>
</tr>
<tr>
<td>Incompatibility</td>
<td></td>
</tr>
<tr>
<td>Interactions</td>
<td></td>
</tr>
<tr>
<td>Storage</td>
<td>Locked refrigerator at 2° to 8 °C</td>
</tr>
<tr>
<td>Side Effects</td>
<td></td>
</tr>
<tr>
<td>Contra-indications</td>
<td>None known</td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
</tbody>
</table>
# Glucose infusion

**Essential nutrient**

## Indications for use

Hypoglycaemia, and as part of maintenance of fluid balance

## Preparation

<table>
<thead>
<tr>
<th>Glucose concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>5%</td>
</tr>
<tr>
<td>10%</td>
</tr>
<tr>
<td>15%</td>
</tr>
<tr>
<td>20%</td>
</tr>
<tr>
<td>50%</td>
</tr>
<tr>
<td>4% / sodium chloride 0.18%</td>
</tr>
</tbody>
</table>

## Administration

### Dosage

As prescribed

### Routes

- IV
- IO (up to 25%)

### Compatibility

Sodium chloride 0.9%

### Incompatibility

- Blood products
- Phenytoin
- Amphotericin and metronidazole are only compatible with 5% glucose solution

### Interactions

- None known

## Storage

Locked medicine cupboard

## Side Effects

- Hyperglycaemia
- Local reaction

Concentrated solutions are highly irritant

## Contra-indications

None known

## Other
Heparin sodium

Anticoagulant

Indications for use
Maintain patency of peripheral lines and arterial lines
Where anticoagulation is required enoxaparin should be used

Preparation
To maintain patency of arterial lines add 0.5 mL of 1000 units in 1 mL to 500 mL sodium chloride 0.45% to produce a final concentration of 1 unit in 1 mL

Administration

Dosage
0.5 mL per hour = 0.5 units/hour

HepSal PERIPHERAL
50 U/50 ml (1 U/ml)

HepSal UAC
50 U/50 ml (1 U/ml)

Routes
Intravenous
Intra-arterial

Compatibility
Glucose 5%
Sodium chloride 0.9%

Incompatibility
Amphotericin
Dobutamine
Gentamicin
Metronidazole
Phenytoin
Vancomycin

Interactions
Epoprostenol    anticoagulant action potentiated

Storage
Locked refrigerator at 2° to 8° C
### Side Effects

- Haemorrhage
- Extravasation may cause tissue necrosis
- Thrombocytopenia
- Tachycardia
- Hypersensitivity
- Angioedema
- Hypotension
- Anaphylaxis
- Osteoporosis
- Alopecia

### Contra-indications

- Active or recent haemorrhage

### Other

- Reversed with protamine sulphate
- 1 mg protamine may reverse 100 units heparin - dose may need to be increased depending upon clinical efficacy

---

Hepatitis B immunoglobulin

Obtained from plasma from selected donors who have high levels of antibody to hepatitis B surface antigen

Indications for use

Babies receive Hepatitis B immunoglobulin and vaccine if ¹:
- Mother had acute Hepatitis B in pregnancy
- Mother is HBsAg positive and HBeAg positive
- Mother is HBsAg positive and Anti-HBe negative
- Mother is HBeAg negative and Anti-HBe negative
- Mother is HBeAg positive and Anti-HBe positive
- One or more of the e-markers are unknown

All low birthweight babies (<1500 g) regardless of e-antigen status

Immunoglobulin is not indicated if ¹:
- Mother is Anti-HBe positive and HBeAg negative

Preparation

100 units in 1 mL

Administration

Dosage 200 units as soon after birth as possible, preferably within 12 hours and not later than 48 hours

Routes IM

Compatibility

Incompatibility

Interactions

Storage

Locked refrigerator at 2° to 8°C

Side Effects

Anaphylaxis
Local reaction

Contra-indications

None
Wherever immediate protection is required, administration of hepatitis B immunoglobulin should be combined with simultaneous administration of hepatitis B vaccine at a different site.

Available from Public Health Laboratories on a named patient basis only. Must be ordered by medical staff during normal laboratory hours. At weekends seek advice from PHLS on-call physician.

1 Health Protection Agency. Immunoglobulin Handbook. June 2004
Hepatitis B vaccine

A suspension of hepatitis B surface antigen produced by a recombinant DNA technique

**Indications for use**
Active immunisation against hepatitis B virus for babies who are at increased risk of hepatitis B (see below)

**Preparation**
10 micrograms in 0.5 mL pre-filled syringe

Shake well before use

**Administration**

**Dosage**
10 micrograms

Administered within 24 hours of birth, then at 1 and 2 months, with a booster at 1 year

**Routes**
IM - preferred site in neonates is the antero-lateral thigh

Must not be given IV or intradermally

**Compatibility**

**Incompatibility**

**Interactions**

**Storage**
Locked refrigerator at 2° to 8° C

**Side Effects**
Local reaction
Abnormal liver function tests
Rash
Fever

**Contra-indications**
Severe febrile infections
Other

Must not be mixed in the same syringe, or injected at the same site as other vaccines

Babies born to HBeAg positive mothers should be given hepatitis B immunoglobulin at the same time as the vaccine, at a different site

Infants are at increased risk if they are born to mothers known to be chronic carriers of hepatitis B or who have had acute hepatitis B during pregnancy, who are parenteral drug misusers, who change sexual partners frequently, where there is close family contact with a case or carrier or where travel to an area of high prevalence is planned
### Human albumin solution

**HAS**

Sterile preparation of serum albumin obtained from healthy human donors

| **Indications for use** | Replacement of circulating volume  
|                        | Hypotension  
|                        | Poor peripheral perfusion  
|                        | Hypoalbuminaemia |

| **Preparation** | 4.5% solution  
|                 | 20% solution |

| **Administration** | Dosage  
|                   | 4.5% solution 10 mL/kg  
|                   | 20% solution 5 mL/kg  

| **Rout es** | IV bolus  
|            | IV infusion over 30 minutes  
|            | IO |

| **Compatibility** | Glucose 5%  
|                   | Glucose 10%  
|                   | Sodium chloride 0.45%  
|                   | Sodium chloride 0.9% |

| **Incompatibility** | Amphotericin  
|                     | Metronidazole  
|                     | Midazolam  
|                     | Vancomycin |

| **Interactions** |

<p>| <strong>Storage</strong> | Locked refrigerator at 2° to 8° C |</p>
<table>
<thead>
<tr>
<th><strong>Side Effects</strong></th>
<th>Febrile reaction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Anaphylaxis</td>
</tr>
<tr>
<td></td>
<td>Hypothermia if infused immediately after removal from the refrigerator</td>
</tr>
<tr>
<td><strong>Contra-indications</strong></td>
<td>Fluid overload</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>Protective gloves must be worn when handling this product. Batch and bottle number must be recorded after administration</td>
</tr>
<tr>
<td></td>
<td>Vials should be used once only then discarded</td>
</tr>
</tbody>
</table>
Hyaluronidase

An enzyme which depolymerises hyaluronic acid, a mucopolysaccharide present in the intercellular matrix of connective tissue

Indications for use

To facilitate the diffusion of extravasated fluid and thereby reduce the risk of tissue necrosis

Therapeutic intervention is required when there is local swelling with tense overlying skin, central cutaneous blanching, absent capillary refill after digital pressure, a demarcation line or blistering

This procedure must be performed as soon as possible after extravasation has occurred

Preparation

1500 international units ampoule as dry powder

Add 1.5 mL of water for injection (or sodium chloride 0.9%) to produce a final concentration of 1000 international units in 1 mL

Use immediately after reconstitution

Administration

**Dosage**

1000 international units

**Routes**

Inject into the subcutaneous tissue around the periphery of the infiltrated area

**Compatibility**

Glucose 5%
Glucose 4.0% / sodium chloride 0.18%
Sodium chloride 0.9%

**Incompatibility**

**Interactions**

**Storage**

Locked medicine cupboard

**Side Effects**

Allergic reactions
### Contra-indications
- Must not be used for IV injection
- Must not be injected into or around an infected area
- Do not apply directly to the cornea

### Other
- Following infiltration with hyaluronidase the area should be infused with large volumes (up to 500 mL) of sodium chloride 0.9%

Hydralazine

Vasodilator

Indications for use
Raised blood pressure and increased peripheral vascular resistance

Preparation
20 mg in 1 mL ampoules

To reconstitute add 0.86 mL of water for injections to 20 mg ampoule (displacement value 0.14 mL) to produce a solution of 20 mg in 1 mL

Injection may be used orally

Administration

Dosage
Oral: 0.5 mg/kg 8 hourly increasing to a maximum of 2.5 mg/kg 8 hourly

IV infusion over 30 minutes:
100 micrograms/kg/single dose repeated 4 to 6 times daily as required
Add 0.5 mL of hydralazine 20 mg in 1 mL to 49.5 mL of sodium chloride 0.9% to produce a final concentration of 200 micrograms in 1 mL

IV infusion continuous
12.5 micrograms/kg/hour increasing to 50 micrograms/kg/hour as required
Add 0.05 mL of hydralazine 20 mg in 1 mL to 49.95 mL of sodium chloride 0.9% to produce a final concentration of 20 micrograms in 1 mL

HYdralazin 20mcg/ml
1000 µg/50 ml (20 µg/ml)

Routes
IV infusion over 30 minutes
IV infusion continuous
Oral

Compatibility
Sodium chloride 0.9%

Incompatibility
Glucose 10%
Glucose 5%
### Interactions
- **Antihypertensives** enhanced effect
- **Corticosteroids** reduced hypertensives effect

### Storage
Locked medicine cupboard

### Side Effects
- Tachycardia
- Fluid retention
- Nausea
- Vomiting
- Diarrhoea
- Anaemia
- Leucopenia
- Thrombocytopenia
- Neutropenia
- Haemolysis

### Contra-indications
- Severe tachycardia
- Heart failure with high cardiac output
- Skin, heart and cerebral vascular disorder
- SLE

### Other
- Dose reduced in impaired renal or hepatic function
- In overdose adrenaline should not be used to increase blood pressure
Hydrocortisone sodium phosphate

Indications for use

Replacement therapy for cortisol deficiency

Treatment of anaphylaxis

Hypotension resistant to vasopressors and volume replacement

Preparation

100 mg in 1 mL injection (injection can also be given orally)

Oral - solution provided by pharmacy

Administration

Dosage

Shock
25 mg/kg repeated after 6 hours if necessary

Replacement in adrenal suppression
3 mg/metre$^2$ 6 hourly

If ill
9 mg/metre$^2$ 6 hourly

If vomiting
12 mg stat IM if ≤ 34 weeks gestation
25 mg stat IM if > 34 weeks gestation

Prophylaxis in early adrenal insufficiency
Starting before 48 hours of age
1 mg/kg/day for 9 days followed by
0.5 mg/kg/day for 3 days

Replacement in congenital adrenal hyperplasia
3.75 mg/metre$^2$ 6 hourly if < 28 days old
5 mg/metre$^2$ 8 hourly if ≥ 28 days old

Resistant hypotension
1 mg/kg 12 hourly

Higher doses of 3 to 6 mg/kg/day in 2 to 4 divided doses have been used in infants with severe capillary leak or when previously treated with steroids

Lower doses of 1.5 mg/kg 6 hourly over 30 minutes have also been recommended

Anaphylaxis
4 mg/kg IV
Routes
- IV bolus over 1 minute
- IV infusion (over 30 minutes)
- Oral
- IM

Compatibility
- Glucose 5%
- Glucose 10%
- Glucose 4.0% / sodium chloride 0.18%
- Sodium chloride 0.9%
- Parenteral nutrition - clear fluids

Incompatibility

Interactions
- Indomethacin – increased risk of GI tract perforation

Storage
- Locked medicine cupboard

Side Effects
- Adrenal suppression
- Sodium retention

Contra-indications
- None absolute

Other
- When used for replacement in adrenal suppression it is important that:
  1. Instructions are given to double the dose during any intercurrent illness
  2. Arrangements are made for follow up by the paediatric endocrine team
  3. The family is seen by the paediatric endocrine liaison nurse before discharge wherever possible

4 Rajah V. Treatment of hypotension in very low birthweight infants. Arch Dis Child 1998;78:F156
5 Watterberg K. Preliminary results of prophylactic hydrocortisone trial. Hot topics in Neonatology 2004
# Ibuprofen

Prostaglandin synthetase inhibitor

## Indications for use
Closure of patent ductus arteriosus

## Preparation
5 mg in 1 mL

## Administration

<table>
<thead>
<tr>
<th>Dosage</th>
<th>1&lt;sup&gt;st&lt;/sup&gt; dose</th>
<th>2&lt;sup&gt;nd&lt;/sup&gt; dose</th>
<th>3&lt;sup&gt;rd&lt;/sup&gt; dose</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10 mg/kg</td>
<td>5 mg/kg after 24 hours</td>
<td>5 mg/kg after a further 24 hours</td>
</tr>
</tbody>
</table>

The whole course may be repeated after 48 hours if the first course is not successful or the duct re-opens

## Routes
IV infusion over 15 minutes

## Compatibility
- Glucose 5%
- Sodium chloride 0.9%

## Incompatibility

- Digoxin: increases plasma levels
- Phenytoin: increased plasma levels
- Diuretics: reduced effects
- Potassium sparing diuretics: hyperkalaemia
- Antihypertensives: reduced effects

## Storage
Locked medicine cupboard
**Side Effects**

- Gastrointestinal bleeding
- Gastrointestinal disturbance
- Gastrointestinal perforation
- Feeding difficulties
- Oliguria
- Haemorrhage
- Renal impairment
- Impaired resistance to infection
- Hyponatraemia
- Hypokalaemia
- Increase in urea and creatinine
- Pulmonary hypertension
- Impaired platelet function
- Weight gain
- Fluid retention

**Contra-indications**

- Marked jaundice
- Thrombocytopenia
- Intraventricular haemorrhage
- Gastrointestinal bleeding
- Active bleeding
- Evidence of life threatening infection
- Impaired renal function

**Other**

Said to be as effective as indometacin for the treatment of patent ductus arteriosus in preterm infants with respiratory distress syndrome but less likely to induce oliguria.

---

# Immunoglobulin

A preparation of immunoglobulins, mainly immunoglobulin G, obtained from plasma collected from donors

## Indications for use
- Hypogammaglobulinaemia
- Idiopathic thrombocytopenic purpura
- Immune haemolytic anaemia and jaundice

## Preparation
50 mg in 1 mL

## Administration

<table>
<thead>
<tr>
<th>Dosage</th>
<th>Route</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Thrombocytopenia</strong></td>
<td>1 g/kg daily on day 1 to day 3</td>
<td>Thrombocytopenia</td>
</tr>
<tr>
<td><strong>Immune haemolytic anaemia and jaundice¹</strong></td>
<td>1 g/kg over 4 hours</td>
<td>Immune haemolytic anaemia and jaundice</td>
</tr>
<tr>
<td><strong>Severe neonatal sepsis²</strong></td>
<td>500 mg/kg immediately</td>
<td>Severe neonatal sepsis</td>
</tr>
<tr>
<td></td>
<td>Repeat dose after 1 to 2 days if the serum IgG level is still &lt; 5 g/L</td>
<td></td>
</tr>
</tbody>
</table>

For other conditions discuss with consultant responsible for initiating treatment

<table>
<thead>
<tr>
<th>Routes</th>
<th>Storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV infusion starting at 0.5 mL/kg/hr</td>
<td>Locked refrigerator at 2°C to 8°C C</td>
</tr>
<tr>
<td>The rate should then be doubled at hourly intervals twice unless there is a systemic reaction</td>
<td>Discard any unused solution immediately after piercing rubber cap</td>
</tr>
</tbody>
</table>

## Compatibility
- Glucose 5%
- Sodium chloride 0.9%

## Incompatibility

## Interactions
Side Effects

- Anaphylaxis
- Hypotension
- Cyanosis
- Fever
- Tachycardia

Contra-indications

None absolute

Other

Live vaccines should not normally be given until three months after a dose of immunoglobulin, or if immunoglobulin is to be given within the following two weeks.

2. Ohlsson A, Lacey JB. Intravenous immunoglobulin for preventing infection in preterm and/or low birth weight infants. Cochrane Database of Systematic Reviews 2004 issue 1
Indometacin (Indomethacin)

Prostaglandin synthetase inhibitor

Indications for use
Closure of a patent ductus arteriosus

Preparation
1 mg vial of dry powder

To reconstitute add 2 mL of water for injections (displacement volume negligible) to produce a solution of 500 micrograms in 1 mL. Add 1 mL of this solution to 4 mL of sodium chloride 0.9% to produce a final concentration of 100 micrograms in 1 mL.

Administration

Dosage
To avoid a large bolus dose being administered, the dose should be flushed by infusing 0.5 mL of sodium chloride 0.9% over 30 minutes.

Low dose
100 micrograms/kg once daily for 6 days

High dose
First dose: 200 micrograms/kg/dose
Subsequent doses: 100 micrograms/kg/dose if < 48 hours old, 200 micrograms/kg/dose if 2 to 7 days old, 250 micrograms/kg/dose if > 7 days old

To be administered every 12 to 24 hours to a total of 3 doses. (Neonatal Formulary recommends a loading dose of 200 micrograms/kg followed by 5 further doses of 100 micrograms/kg at daily intervals. Treatment may be stopped early if there is good ultrasound evidence of duct closure)

Prophylaxis dose
100 micrograms/kg/dose starting 6 to 12 hours after birth with 2 further doses at 24 hourly intervals

Routes
IV over 30 minutes

Compatibility
Sodium chloride 0.9%
Incompatibility

- Amphotericin
- Calcium salts
- Dobutamine
- Dopamine
- Gentamicin
- Metronidazole
- Tolazoline

Interactions

- Captopril: antihypertensive effects reduced or abolished

Storage

- Locked medicine cupboard
- Stable for 24 hours

Side Effects

- Gastrointestinal bleeding
- Gastrointestinal disturbance
- Haemorrhage
- Renal impairment
- Impaired resistance to infection
- Hyponatraemia
- Hypokalaemia
- Increase in urea and creatinine
- Pulmonary haemorrhage
- Impaired platelet function
- Weight gain
- Fluid retention
- Necrotising enterocolitis
- Retinopathy of prematurity

Contra-indications

- Marked jaundice
- Low platelet count
- Intraventricular haemorrhage
- Gastrointestinal bleeding
- Bleeding tendency
- Evidence of infection
- Impaired renal function
Other

Care with other nephrotoxic drugs

Monitor urine output and blood electrolytes

If using the high dose regime, feeds should be stopped from 2 hours before until 2 hours after each individual dose has been administered. This does not apply to the low dose regime.

There are data to suggest that a prolonged course of indometacin (0.1 mg/kg every 24 hours for 7 days) confers no additional benefit to a course of 0.2, 0.1 and 0.1 mg/kg in 24 hours.

---

Insulin (Human neutral)

Pancreatic hormone involved in the regulation of blood glucose concentration

### Indications for use

- Control of high blood glucose
- Control of hyperkalaemia

### Preparation

100 units in 1 mL

Vial contains 10 mL = 1000 units

Use insulin syringe when possible (1 mL syringe can be used)  
(0.01 mL = 1 mark on the syringe = 1 unit of insulin)

Normal strength insulin infusion 0.1 unit in 1 mL
Add 5 units of insulin to 50 mL of glucose 5% to produce a final concentration of 0.1 unit in 1 mL
Insulin 0.1 Unit/ml  
5 U/50 ml (0.1 U/ml)

Double strength insulin infusion 0.2 units in 1 mL
Add 10 units of insulin to 50 mL of glucose 5% to produce a final concentration of 0.2 units in 1 mL
Insulin 0.2 Unit/ml  
10 U/50 ml (0.2 U/ml)

Quadruple strength insulin infusion 0.4 units in 1 mL
Add 20 units of insulin to 50 mL of glucose 5% to produce a final concentration of 0.4 units in 1 mL
Insulin 0.4 Unit/ml  
20 U/50 ml (0.4 U/ml)

Stable when diluted for 24 hours

### Administration

**Dosage**

*Hyperglycaemia*
Aim for blood glucose of 7 to 10 mmol/L while requiring insulin  
(normal range without insulin is 4 to 8 mmol/L)

*Guidance for starting*
Commence infusion at 0.04 units/kg/hr  
Check blood glucose within 1 hour of starting  
Increase dose by 0.02 units/kg/hr until blood glucose is decreasing by at least 10% per hour
To prevent hypoglycaemia if blood glucose is:

7 to 11 mmol/L and decreasing
reduce the infusion rate by 0.02 units/kg/hr
Recheck blood glucose within 1 hour

4 to 6.9 mmol/L
reduce infusion rate by 50%
Recheck blood glucose within 1 hour

< 4 mmol/L
stop infusion
Recheck blood glucose within 1 to 2 hours of reducing the dose then check every 2 to 4 hours until stable

Note: a rapid drop in blood glucose may require that the insulin infusion be stopped

The concentration of insulin may need to be increased if blood glucose remain high

Hyperkalaemia
0.1 units/kg/hour

<table>
<thead>
<tr>
<th>Routes</th>
<th>IV infusion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IO</td>
</tr>
</tbody>
</table>

| Compatibility | Glucose 5%  |
|               | HAS         |
|               | Sodium chloride 0.9% |

| Incompatibility | Amphotericin  |
|                | Digoxin      |
|                | Dopamine     |
|                | Metronidazole |
|                | Phenobarbital |
|                | Phenytoin    |

| Interactions | |

| Storage | Locked refrigerator at 2° to 8° C |

| Side Effects | Hypoglycaemia |
|             | Local reaction |

| Contra-indications | None known |

| Other | Blood glucose may be very unstable and close monitoring is essential |
Isoprenaline

Beta adrenergic stimulant

Indications for use
To produce an increase in heart rate and contractility, and peripheral vasoconstriction
Congenital heart block

Preparation
100 micrograms in 1 mL ampoules
Dilute with glucose 5% to achieve required concentration

Administration

Dosage
20 nanogram/kg/minute
increasing to a maximum of 200 nanograms/kg/minute

Add 1.2 mL of isoprenaline 100 micrograms in 1 mL to 8.8 mL of glucose 5% or sodium chloride 0.9% to produce a final concentration of 12 micrograms in 1 mL
ISOpren 12000ng/ml
120 µg/10 ml (12 µg/ml)

Routes
IV infusion
IO

Compatibility
Glucose 5%
Glucose 4.0% / sodium chloride 0.18%
Sodium chloride 0.9%

Incompatibility
Amphotericin
Metronidazole
Sodium bicarbonate

Interactions

Storage
Locked medicine cupboard
**Side Effects**
- Asystole
- Arrhythmias
- Tremor
- Sweating
- Flushing
- Tachycardia

**Contra-indications**
- Do not give at the same time as Adrenaline
- Do not give if heart rate >180

**Other**
# Levothyroxine (T₄)

Essential hormone produced by the thyroid gland

## Indications for use
Hypothyroidism

## Preparation
25 microgram tablets
Powders prepared in pharmacy

## Administration

<table>
<thead>
<tr>
<th><strong>Dosage</strong></th>
<th>10 micrograms/kg once daily</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Adjusted according to T₄ and TSH results</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Routes</strong></th>
<th>Oral</th>
</tr>
</thead>
</table>

## Compatibility

## Incompatibility

## Interactions

## Storage
Locked medicine cupboard

## Side Effects
Tachycardia
Tremor
Sweating
Flushing
Fever
Vomiting

## Contra-indications
Untreated thyrotoxicosis
Other

Should be used with extreme caution in hypertension

Should not be given to patients with adrenal insufficiency without adequate corticosteroid, otherwise thyroid replacement therapy may precipitate an acute adrenal crisis

Care is required when giving levothyroxine to patients with diabetes mellitus or diabetes insipidus
Lidocaine (Lignocaine)

Local anaesthetic agent which may also be used for treatment of ventricular arrhythmias and as an anticonvulsant

Indications for use

Treatment of ventricular arrhythmias refractory to normal first line agents. Lidocaine may be the anti-arrhythmic of choice in ventricular tachycardia and ventricular fibrillation. May be used as a second or third line anticonvulsant for resistant fits

Local anaesthesia

Preparation

1% solution = 10 mg in 1 mL

Administration

Dosage

For resistant arrhythmias:
0.5 mg
repeat at 5 minute intervals to a maximum of 5 mg/kg

20 micrograms/kg/minute as an infusion increasing to a maximum of 50 micrograms/kg/minute

Add 2 mL of lidocaine 10 mg in 1 mL to 8 mL of glucose 5% or sodium chloride 0.9% to produce a final concentration of 2 mg in 1 mL

LIDOcain 2000mcg/ml
20 mg/10 ml (2 mg/ml)

For resistant fits:
2 mg/kg over 15 minutes followed by continuous infusion at 6 mg/kg/hr for 12 hours reducing to 4 mg/kg/hr for 12 hours then 2 mg/kg/hr for 12 hours and stop if fits controlled

Infiltration local anaesthesia:
0.3 mL of 1% lidocaine will give anaesthesia within 1 to 2 minutes lasting 1 to 2 hours
0.6 mL of 1% lidocaine will give anaesthesia lasting 2 to 3 hours

Routes

IV bolus over 3 minutes
IV infusion
IO

Compatibility

Glucose 5%
Sodium chloride 0.9%
### Incompatibility
- Amphotericin
- Metronidazole
- Phenytoin

### Interactions
- Midazolam: decreased lidocaine levels

### Storage
- Locked medicine cupboard

### Side Effects
- Hypotension
- Bradycardia
- Heart failure

### Contra-indications
- Should not be given to patients who are hypovolaemic

### Other
- Monitor levels
- Therapeutic levels 3 to 6 mg/L

Use with caution in patients with:
- Bradycardia
- Congestive cardiac failure
- Respiratory depression
- Hepatic insufficiency

---

**Liothyronine (T₃)**

**Thyroid hormone**

**Indications for use**
Treatment of hypothyroidism when oral route is inappropriate

**Preparation**
20 microgram ampoule of dry powder. To reconstitute add 1 mL water for injection to the ampoule. Draw up the entire contents of the ampoule and add to 19 mL glucose 5%. This produces a solution of 1 microgram in 1 mL

**Administration**

**Dosage**
1 microgram/kg 12 hourly

**Routes**
IV infusion (over 60 minutes)

**Compatibility**
Glucose 5%

**Incompatibility**

**Interactions**

**Storage**
Locked medicine cupboard

**Side Effects**
Tachycardia
Tremor
Sweating
Flushing
Fever
Vomiting

**Contra-indications**
Untreated thyrotoxicosis
Other

Should be used with extreme caution in hypertension

Should not be given to patients with adrenal insufficiency without adequate corticosteroid, otherwise thyroid replacement therapy may precipitate an acute adrenal crisis

Care is required when giving thyroxine to patients with diabetes mellitus or diabetes insipidus

20 to 25 micrograms of liothyronine is equivalent to approximately 100 micrograms of levothyroxine
Magnesium sulphate

Pulmonary vasodilator
Essential electrolyte

**Indications for use**

Hypomagnesaemia

Persistent pulmonary hypertension

**Preparation**

50% solution containing 2 mmol of magnesium in 1 mL

Add 1 mL of magnesium sulphate 2 mmol (500 mg) in 1 mL to 19 mL of glucose 5% or sodium chloride 0.9% to produce a final concentration of 0.1 mmol (25 mg) in 1 mL

**Administration**

**Dosage**

**Hypomagnesaemia**

0.4 mmol/kg 12 hourly (maximum 3 doses)

**Persistent pulmonary hypertension**

*Loading*: 0.8 mmol/kg/dose

*Maintenance*: 0.08 mmol/kg/hour increasing to 0.2 mmol/kg/hour

**Routes**

IV infusion over 30 minutes

**Compatibility**

Glucose 5%
Sodium chloride 0.9%

**Incompatibility**

Amphotericin
Dobutamine
Metronidazole
Phosphates
Sodium bicarbonate

**Interactions**

Atracurium duration and depth of block may be increased

Nifedipine neuromuscular blockade possible

**Storage**

Locked medicine cupboard
**Side Effects**

Hypotonia  
Hypotension  
Respiratory depression  
Nausea  
Vomiting  
Flushing  
Arrhythmias  
Cardiac arrest

**Contra-indications**

Administer with caution in impaired renal function

**Other**

Monitor levels at 3 to 6 hourly intervals  
First level within 3 hours of administration  
Normal levels: 2.5 to 3.5 mmol/L  
Antidote is calcium gluconate

Meningococcal C vaccine

Conjugate vaccine active against the group C meningococcus

Indications for use

Active vaccine for protection against infection with the group C meningococcus

To be administered at 3 months from birth at the same time as the diphtheria, tetanus, pertussis and haemophilus influenzae type B and polio vaccine

To be administered at 4 months from birth at the same time as the diphtheria, tetanus, pertussis and haemophilus influenzae type B and polio vaccine and pneumococcal vaccine

Also given at 12 months with haemophilus influenzae type B vaccine

Preparation

Supplied in suspension in a single dose vial

Administration

Dosage

0.5 mL

Routes

IM

Do not mix with other vaccines in the syringe

Compatibility

Incompatibility

Interactions

Storage

Locked refrigerator at 2° to 8° C

Side Effects

Erythema
Local reaction
Fever
Irritability
Systemic reactions possible

Contra-indications

Hypersensitivity to any vaccine component including meningococcal C polysaccharide, diphtheria toxoid or CRM197 carrier protein, or tetanus toxoid
**Other**

- Injection should be postponed if the patient has an acute febrile illness.
- Consent form necessary.
- Community Health Sheffield must be notified after vaccine has been administered.
- Introduced in November 1999. Further information on side effects may be available. Yellow card reporting of any suspected side effects is essential.
- Doses at 3 and 4 months should be Meningitec ® or Neisvac C ® vaccines.
- Dose at 12 months should be Menitorix ® vaccine.
Meropenem

Carbapenem beta-lactam antibiotic with a broad spectrum of activity

**Indications for use**
Aerobic and anaerobic gram positive and gram negative infections

**Preparation**
500 mg
Add 9.56 mL of water to a 500 mg vial (displacement value 0.44 mL). Shake well to mix
Take 2 mL of the above solution. Add to 3mL glucose 5% to produce a solution of 20 mg in 1 mL

**Administration**

<table>
<thead>
<tr>
<th>Dosage</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 mg/kg</td>
<td>12 hourly if &lt; 7 days</td>
</tr>
<tr>
<td>20 mg/kg</td>
<td>8 hourly if &gt; 7 days</td>
</tr>
</tbody>
</table>

**Meningitis or severe infection**

<table>
<thead>
<tr>
<th>Dosage</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 mg/ kg</td>
<td>12 hourly if &lt; 7 days old</td>
</tr>
<tr>
<td></td>
<td>8 hourly if ≥ 7 days old</td>
</tr>
</tbody>
</table>

**Renal impairment**

<table>
<thead>
<tr>
<th>Dosage</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 mg/ kg</td>
<td>24 hourly</td>
</tr>
</tbody>
</table>

**Renal failure or anuria**
Stop treatment unless dialysis is commenced

**Routes**
IV infusion over 30 minutes

**Compatibility**
Glucose 5%
Glucose 10%
Sodium chloride 0.9%
Parenteral nutrition - clear fluids

**Incompatibility**
Aciclovir
Amphotericin

**Interactions**

**Storage**
Locked medicine cupboard
## Side Effects
- Local reaction
- Rash
- Gastrointestinal disturbance
- Pseudomembranous colitis
- Neutropenia
- Thrombocytopenia
- Eosinophilia
- Hepatic dysfunction
- Convulsions

## Contra-indications
- Hypersensitivity to beta lactam antibiotics

## Other
- Use with caution with nephrotoxic drugs
- May cause positive Coombs test without haemolysis
Metronidazole

Antibiotic used for treatment of anaerobic infection

**Indications for use**
Proven or suspected infection involving anaerobic organisms. Likely in any infection involving the gastrointestinal tract

**Preparation**
5 mg in 1 mL

**Administration**

**Dosage**

- **Loading dose:** 15 mg/kg
- Followed after 24 hours by:
  - **Maintenance dose:**
    - 7.5 mg/kg 12 hourly if < 28 days old
    - 7.5 mg/kg 8 hourly if ≥ 28 days old

**Routes**
- IV infusion over 30 minutes
- Oral

**Compatibility**
Glucose 5%
Glucose 4.0% / sodium chloride 0.18%
Sodium chloride 0.9%
Parenteral nutrition - clear fluids
Cefotaxime

*see reference *

**Incompatibility**
Glucose 10%
Sodium bicarbonate

**Interactions**
Cimetidine decreased plasma levels
Phenobarbital increases excretion rates

**Storage**
Locked refrigerator at 2° to 8° C
Bag must be stored in locked medicine cupboard
### Side Effects
- Angioedema
- Gastrointestinal disturbance
- Leucopenia
- Peripheral neuropathy
- Rash
- Convulsions
- Abnormal LFTs
- Hepatitis
- Jaundice
- Thrombocytopenia
- Aplastic anaemia

### Contra-indications
- Caution in hepatic encephalopathy

### Other
- Protect from light

---

Miconazole

Antifungal agent

Indications for use
Treatment of oral or topical fungal infections resistant to nystatin

Preparation
2% oral gel
2% cream

Administration

Dosage
Oral: 1 to 2 mL of gel applied directly to affected area twice daily after feeds
Topical: Twice daily for at least 10 days

Routes
Oral
Topical

Compatibility

Incompatibility

Interactions
Phenytoin increased levels of phenytoin

Storage
Locked medicine cupboard

Side Effects

Contra-indications

Other
Midazolam

Benzodiazepine used for sedation and as an anticonvulsant

Indications for use

- Single dose administration prior to induction of anaesthesia
- Sedation
- Second or third line anticonvulsant used for resistant fits

Preparation

- 2 mg in 1 mL

Add 1 mL of the 2 mg in 1 mL solution to 19 mL of glucose 5% to give a final concentration of 100 micrograms in 1 mL

Midazolam 100 mcgs/ml
  - 2 mg/20 ml (0.1 mg/ml)

IM or intranasal doses

- May be given undiluted or dilute 1:1 with glucose 5%

Oral solution

- 2.5 mg in 1 mL

Administration

Dosage

**Single dose:**

- 50 micrograms/kg IV over at least 5 minutes
- Increasing to a maximum of 300 micrograms/kg

- 200 micrograms/kg has been used to sedate infants for investigational purposes
- Can be repeated 2 to 4 hourly
- May be given IM

If vascular access is not available the intravenous solution may be administered by the intranasal route at a dose of 150 micrograms/kg

**Oral**

- 0.5 mg/kg using prepared oral solution

**Continuous infusion:**

- 10 micrograms/kg/hr for up to 4 days
- Increasing to a maximum of 60 micrograms/kg/hr

- Infusion rate must be halved after 24 hours in babies of less than 33 weeks post conceptional age to prevent drug accumulation

- Doses may need to be increased after prolonged administration because of development of tolerance or increased clearance
Intranasal
200 micrograms/kg/dose
increasing to a maximum of 300 micrograms/kg/dose

Rectal
500 micrograms/kg/dose
increasing to a maximum of 750 micrograms/kg/dose

Anticonvulsant dose:
100 micrograms/kg over 15 minutes followed by
30 micrograms/kg/hr
increasing to a maximum of 60 micrograms/kg/hr

Optimum midazolam doses for preterm neonates have not been defined ¹

Routes
- IV
- Intranasal
- Oral
- IM
- IV infusion
- PR

Compatibility
- Glucose 5%
- Sodium chloride 0.9%
- Parenteral nutrition - clear fluids
- Water for injections

Incompatibility
- Amphotericin
- Amoxicillin
- Ceftazidime
- Cefuroxime
- Dexamethasone
- Dobutamine
- Flucloxacillin
- Furosemide
- Human albumin solution
- Hydrocortisone sodium phosphate
- Metronidazole
- Phenobarbital
- Sodium bicarbonate
### Interactions
- **Atracurium**: increase and decrease of blockade
- **Calcium channel blockers**: increased midazolam levels
- **Cimetidine**: increased midazolam levels
- **Erythromycin**: increased midazolam levels
- **Fentanyl**: increased midazolam levels
- **Imidazoles**: increased midazolam levels
- **Lignocaine**: decreased lignocaine levels
- **Pancuronium**: increase and decrease of blockade
- **Ranitidine**: increased midazolam levels

### Storage
- Controlled drug cupboard

### Side Effects
- Myoclonus
- Dystonic posturing
- Choreoathetosis
- Encephalopathy
- Pain
- Local reaction
- Hiccups
- Respiratory depression
- Hypotension

### Contra-indications
- None absolute

### Other
- Effects can be reversed by flumazenil 20 micrograms/kg IV.
- Half life of flumazenil is short and re-treatment may be needed

### Cochrane Review Conclusions
- There are insufficient data to promote the use of intravenous midazolam infusion as a sedative for neonates undergoing intensive care. This review raises concerns about the safety of midazolam in neonates. Further research on the effectiveness and safety of midazolam in neonates is needed

2. Ng E, Taddio A, Ohlsson A. Intravenous midazolam infusion for sedation of infants in the neonatal intensive care unit. (Cochrane Review) In: The Cochrane Library, issue 3, 2004
Morphine sulphate

Opioid analgesic

Indications for use
- Sedation
- Analgesia

Preparation

**Bolus:**
- 10 mg in 1 mL ampoules
- If administering a small volume, dilute to 1 mg in 1 mL before administration

**Infusion:**
- 50 micrograms in 1 mL
- Prepared by adding 0.15 mL of morphine 10 mg in 1 mL to 29.85 mL glucose 5%
- MORphine 50mcg/ml
  - 1.5 mg/30 ml (0.05 mg/ml)

- 100 micrograms in 1 mL
- Prepared by adding 0.3 mL of morphine 10 mg in 1 mL to 29.7 mL glucose 5%
- MORphine 100mcg/ml
  - 3 mg/30 ml (0.1 mg/ml)

**Oral solution:**
- 0.1 mg in 1 mL

Administration

**Dosage**

**Severe pain**
- 200 micrograms/kg/single dose

**Sedation whilst ventilated**
- 100 micrograms/kg/dose  IV bolus over 2 minutes
- 10 micrograms/kg/hour  IV infusion
- Increasing to 40 micrograms/kg/hour if required

**Oral dose**
- 0.05 mg/kg as required for symptom relief
- Dose may be adjusted according to response

**Converting from intravenous to oral**
- Calculate the total daily dose and divide into 6 equal 4 hourly oral doses. Thereafter adjust dose on the basis of clinical efficacy
**Routes**
- IV bolus over 2 minutes
- IV infusion
- IO

**Compatibility**
- Glucose 5%
- Glucose 10%
- Glucose 4.0% / sodium chloride 0.18%
- Sodium chloride 0.9%

**Incompatibility**
- Aciclovir
- Alkalies
- Aminophylline
- Amphotericin
- Calcium salts
- Furosemide
- Phenobarbital
- Phenytoin
- Sodium bicarbonate

**Interactions**

**Storage**
Controlled Drug Cupboard

Prepared syringes should be stored in a locked refrigerator at 2° to 8° C. At the concentration prepared for NICU infusions morphine is not regarded as a controlled drug

**Side Effects**
- Respiratory depression
- Hypotension
- Nausea
- Vomiting
- Constipation
- Urinary retention
- Bradycardia
- Sweating
- Hypothermia
- Urticaria

**Contra-indications**
None absolute

**Other**
Avoid abrupt withdrawal. Reduce according to response
Morphine sulphate (for NAS)

Opioid analgesic

**Indications for use**
Neonatal abstinence syndrome

**Preparation**
0.1 mg in 1 mL oral solution

**Administration**

**Dosage**
0.04 mg/kg every 4 hours

If the infant remains symptomatic despite use of the highest dose in this regime, the maximum dose should be increased until symptoms are controlled.

If symptoms are controlled for a minimum period of 24 hours morphine should be slowly reduced following the regime below. Changes should not be made at intervals of less than 24 hours.

0.03 mg/kg every 4 hours
0.02 mg/kg every 4 hours
0.01 mg/kg every 4 hours
0.005 mg/kg every 4 hours

**Routes**
Oral
IV

**Compatibility**

**Incompatibility**
Aciclovir
Alkalis
Aminophylline
Amphotericin
Calcium salts
Furosemide
Metronidazole
Phenytoin
Phenobarbital
Sodium bicarbonate

**Storage**
Controlled drug cupboard
**Side Effects**
- Respiratory depression
- Hypotension
- Nausea
- Vomiting
- Constipation
- Urinary retention
- Bradycardia
- Sweating
- Hypothermia
- Urticaria

**Contra-indications**
- None absolute

**Other**
- Symptoms should be recorded as detailed in the neonatal narcotic abstinence protocol
# Multivitamins

**Mixture of vitamins A, C and D**

<table>
<thead>
<tr>
<th>Indications for use</th>
<th>Prevention of vitamin deficiencies when oral feeding has been established</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparation</td>
<td>Yellow liquid</td>
</tr>
<tr>
<td><strong>Administration</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Dosage</strong></td>
<td>0.6 mL daily independent of weight</td>
</tr>
<tr>
<td><strong>Routes</strong></td>
<td>Oral</td>
</tr>
<tr>
<td><strong>Compatibility</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Incompatibility</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Interactions</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Storage</strong></td>
<td>Locked medicine cupboard</td>
</tr>
<tr>
<td><strong>Side Effects</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Contra-indications</strong></td>
<td>None known</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>Can be mixed with milk or liquid feeds, or given directly on a spoon</td>
</tr>
</tbody>
</table>
# Mupirocin

**Antibiotic**

<table>
<thead>
<tr>
<th>Indications for use</th>
<th>Skin infections, particularly MRSA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparation</td>
<td>Nasal ointment 2%</td>
</tr>
<tr>
<td>Administration</td>
<td></td>
</tr>
<tr>
<td><strong>Dosage</strong></td>
<td><strong>Nasal carriers</strong></td>
</tr>
<tr>
<td>A small amount to inner surface of each nostril 3 times a day for 5 days using a cotton wool bud</td>
<td></td>
</tr>
<tr>
<td>Routes</td>
<td>Nasal</td>
</tr>
<tr>
<td>Compatibility</td>
<td></td>
</tr>
<tr>
<td>Incompatibility</td>
<td></td>
</tr>
<tr>
<td>Interactions</td>
<td></td>
</tr>
<tr>
<td>Storage</td>
<td>Locked medicine cupboard</td>
</tr>
<tr>
<td>Side Effects</td>
<td>Local reaction</td>
</tr>
<tr>
<td>Contra-indications</td>
<td>Avoid application to the eyes</td>
</tr>
<tr>
<td>Topical ointment (not nasal ointment) contains polyethylene glycol and should be used with extreme caution in neonates</td>
<td></td>
</tr>
<tr>
<td>Topical cream contains benzyl alcohol and should not be used in infants &lt; 1 year of age</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>Should not be applied for more than 5 days due to the risk of resistance developing</td>
</tr>
</tbody>
</table>
Naloxone hydrochloride

Opioid antagonist

Indications for use
Reversal of the effects of opioids in severe respiratory depression. Respiratory depression in the neonate most commonly occurs when opioids have been administered to the mother within 6 hours of delivery.

Preparation
400 micrograms in 1 mL

Administration

Dosage
- Term infants in the delivery room
  200 micrograms
- Any other infant at any other time
  100 micrograms/kg

Dose can be repeated after 10 minutes if there has been no response to administration.

At delivery should only be used when a mother has received opioid analgesia within six hours of delivery and the infant has not started spontaneous respiration despite full ventilatory support.

Routes
- IM
- SC
- IV rapid push
- ET tube
- Umbilical vein

Compatibility
- Glucose 5%
- Sodium chloride 0.9%

Incompatibility
- Amphotericin
- Metronidazole

Interactions

Storage
Locked medicine cupboard
### Side Effects

- Hypotension
- Hypertension
- Tachycardia
- Fibrillation

Depressant in overdose and if baby not affected by opioids

### Contra-indications

- Baby born to mother who has not received opioids

Administration of naloxone to an infant of a narcotic addicted mother can result in acute and severe withdrawal symptoms

Should not be used if depression occurs in association with a significant asphyxial episode

### Other

- The effect of the opioid may last for longer than the effect of the naloxone

Re-treatment at 3 to 4 hours may be needed

**Nitric Oxide (NO)**

Pulmonary vasodilator produced naturally in the endothelial lining of blood vessels

| Indications for use | Hypoxic respiratory failure associated with pulmonary hypertension in neonates ≥ 34 weeks
| Use in preterm infants is currently experimental |

| Preparation | Cylinders containing 400 ppm balance nitrogen |

## Administration

### Dosage

- **≥ 34 weeks gestation**
  - 20 ppm starting dose
  - Reduce after 1 hour to lowest dose compatible with a sustained response

- **< 34 weeks gestation**
  - Nitric oxide is not licensed for this purpose but occasionally it is felt that nitric oxide could be tried in more immature infants with resistant hypoxia
  - 5 ppm starting dose
  - It has been suggested that doses of up to 40 ppm may be required to achieve a response
  - Attempts should be made to reduce the dose needed to minimise the risk of dependency. If stable for 12 hours, reduce the dose by 10% every 3 minutes, but reverse the reduction if oxygen saturation start to fall

### Routes

Inhaled through ventilator circuit

### Compatibility

### Incompatibility

### Interactions

### Storage

Secured cylinder at room temperature
Side Effects

Vasodilatation
Methaemoglobinaemia
Haemorrhage
Hypertension
Bacteraemia
Rebound hypoxia on withdrawal
Haematuria
Hyperglycaemia
Stridor
Cellulitis

At high doses NO is highly toxic

Contra-indications

Neonates known to be dependent on right-to-left or significant left-to-right shunting of blood

None absolute
- Thrombocytopenia
- Deranged clotting

Other

Consultant decision to initiate treatment

Methaemoglobin levels should be checked 1 hour after treatment starts and 12 hourly thereafter. Levels should remain below 2.5%

Nitrogen dioxide (NO₂) levels must be monitored continuously in the expiratory limb of the ventilator circuit

Room air must be intermittently tested for NO and NO₂

Absence of a sustained response is an indication that treatment should be stopped

1. Summary of product characteristics. Inomax ®
3. Finer NN, Barrington KJ. Nitric oxide for respiratory failure in infants born at or near term (Cochrane Review). In The Cochrane Library; Issue 3, 2004
## Nystatin

An antifungal agent

### Indications for use
- Oral candida infections
- Prophylaxis when broad spectrum antibiotics administered

### Preparation
**Oral:**
100,000 international units in 1 mL sugar free suspension

**Topical:**
Ointment containing 100,000 units nystatin per gram

### Administration

<table>
<thead>
<tr>
<th>Dosage</th>
<th>Oral:</th>
<th>1 mL 6 hourly after feeds</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Topical:</td>
<td>For napkin rash, ointment should be applied at each nappy change</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Routes</th>
<th>Oral</th>
<th>Topical</th>
</tr>
</thead>
</table>

### Compatibility

### Incompatibility

### Interactions

### Storage
Locked medicine cupboard

### Side Effects
- Vomiting
- Diarrhoea

### Other
- Not absorbed from gastrointestinal tract
Octreotide

Synthetic analogue of somatostatin

Indications for use

Persistent hypoglycaemia due to hyperinsulinaemia
Resistant chylothorax unresolved after 2 weeks

Preparation

50 micrograms in 1 mL

Administration

Dosage

Persistent hypoglycaemia
1 microgram/kg 4 hourly

Dose may be increased until normoglycaemia is achieved - but only following advice from a paediatric endocrinologist

Resistant chylothorax
0.5 to 4 micrograms/kg/hour

Higher doses have been used

Add 1 mL of octreotide 50 micrograms in 1 mL to 9 mL of sodium chloride 0.9% to produce a final concentration of 5 micrograms in 1 mL

Octreotide 5mcg/ml
50 µg/10 ml (5 µg/ml)

Routes

SC
IV infusion

Compatibility

Sodium chloride 0.9%

Incompatibility

Amphotericin
Metronidazole

Interactions

Cimetidine absorption of cimetidine is delayed

Storage

Locked refrigerator at 2° to 8° C
### Side Effects
- Gastrointestinal disturbance
- Hepatic dysfunction
- Vomiting
- Diarrhoea

### Contra-indications
- None absolute

### Other
- Should be used in consultation with paediatric endocrinologist
- A solution of 500 micrograms in 1 mL is available but is too concentrated for use in neonates

Pancuronium bromide

Muscle relaxant related to curare

Must only be given to babies receiving (or about to receive) ventilatory support

Indications for use

Muscle relaxation

Preparation

2 mg in 1 mL

Add 1 mL pancuronium to 9 mL sodium chloride 0.9% to produce a concentration of 0.2 mg in 1 mL

Administration

Dosage

Loading: 100 micrograms/kg/dose

Maintenance: 50 micrograms/kg/dose as required to maintain muscle relaxation

Routes

Intravenous bolus over 30 seconds

Compatibility

Glucose 5%
Glucose 4.0% / sodium chloride 0.18%
Sodium chloride 0.9%

Incompatibility

Amphotericin
Barbiturates
Metronidazole

Interactions

Midazolam increase and decrease of blockade

Storage

Locked refrigerator at 2° to 8° C

Side Effects

Increase in ventilation requirements
Hypertension
Hypotension

Contra-indications

None known
Other

There is considerable individual variation in sensitivity

Can be reversed with atropine 20 micrograms/kg IV followed by neostigmine 80 micrograms/kg IV
# Paracetamol

**Non-opioid analgesic with antipyretic properties**

## Indications for use
- Analgesia for mild to moderate pain
- Control of pyrexia
- Can be used prophylactically in babies receiving vaccinations to reduce risk of reaction

## Preparation
- 10 mg in 1 mL IV infusion
- 24 mg in 1 mL oral suspension
- 120 mg suppositories

## Administration

<table>
<thead>
<tr>
<th>Dosage</th>
<th>Oral dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 mg/kg</td>
<td>6 to 12 hourly as required to a maximum of 60 mg/kg in 24 hours</td>
</tr>
</tbody>
</table>

- In infants ≥ 37 week gestation dose interval may be reduced to 4 hours when the infant is more than five days old
- In infants < 37 week gestation dose interval should be ≥ 8 hourly

<table>
<thead>
<tr>
<th>IV dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.5 mg/kg</td>
</tr>
</tbody>
</table>

### Routes
- Oral
- PR
- IV over 15 minutes

## Compatibility

## Incompatibility

## Interactions

## Storage
- Locked medicine cupboard
Side Effects
Rash
Acute pancreatitis after prolonged use
Hepatic dysfunction
Renal impairment
Thrombocytopenia
Haemolysis
Agranulocytosis

Contra-indications
Caution in impaired kidney or liver function

Other
For further information on pharmacokinetics see below

Paraldehyde

Hypnotic and sedative with anticonvulsant properties

<table>
<thead>
<tr>
<th>Indications for use</th>
<th>Seizures</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Preparation</th>
<th>Paraldehyde injection</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Administration</th>
<th>0.3 mL/kg single dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dosage</td>
<td>Must be diluted with an equal volume of olive oil before administration</td>
</tr>
<tr>
<td>Routes</td>
<td>PR</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Compatibility</th>
<th>Sodium chloride 0.9%</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Incompatibility</th>
<th>Amphotericin</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Metronidazole</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Interactions</th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Storage</th>
<th>Locked medicine cupboard</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Side Effects</th>
<th>Haemorrhage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Circulatory collapse</td>
</tr>
<tr>
<td></td>
<td>Hypotension</td>
</tr>
<tr>
<td></td>
<td>Local reaction</td>
</tr>
<tr>
<td></td>
<td>Cardiac dilatation</td>
</tr>
<tr>
<td></td>
<td>Respiratory depression</td>
</tr>
<tr>
<td></td>
<td>Acidosis</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Contra-indications</th>
<th>None absolute</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Other</th>
<th>Paraldehyde dissolves plastic. Administer immediately after preparation</th>
</tr>
</thead>
</table>
# Phenobarbital (Phenobarbitone)

**Indications for use**

Seizures

**Preparation**

- 60 mg in 1 mL
  - Must be diluted at least ten times with water for injection
- 3 mg in 1 mL oral solution

**Administration**

**Dosage**

- **Loading dose:** 20 mg/kg
  - A further loading dose of 10 to 20 mg/kg may be given if clinically indicated
- **Maintenance dose:** 3 mg/kg daily
  - Increasing to 5 mg/kg daily

Add 1 mL of phenobarbital 60 mg in 1 mL to 9 mL of glucose 5% or sodium chloride 0.9% to produce a final concentration of 6 mg 1 mL

**Routes**

- IV over 30 minutes
- Oral

**Compatibility**

- Glucose 5%
- Glucose 10%
- Glucose 4.0% / sodium chloride 0.18%
- Sodium chloride 0.9%

**Incompatibility**

- Alkalis
- Amphotericin
- Atracurium
- Chlorpromazine
- Insulin
- Metronidazole
- Midazolam
- Morphine sulphate
- Vancomycin
**Interactions**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloramphenicol</td>
<td>reduced serum levels</td>
</tr>
<tr>
<td>Clonazepam</td>
<td>may alter phenobarbital levels</td>
</tr>
<tr>
<td>Corticosteroids</td>
<td>increased excretion of corticosteroids</td>
</tr>
<tr>
<td>Metronidazole</td>
<td>increased excretion of metronidazole</td>
</tr>
<tr>
<td>Nifedipine</td>
<td>increased clearance</td>
</tr>
<tr>
<td>Theophylline</td>
<td>reduced serum levels</td>
</tr>
</tbody>
</table>

**Storage**

Locked medicine cupboard

**Side Effects**

Respiratory depression  
Gastrointestinal disturbance  
Allergic reactions

**Contra-indications**

None absolute

**Other**

Monitor levels. Take sample at least 2 hours after last dose

Therapeutic levels 20 to 40 mg/L

Toxic symptoms appear at 50 mg/L
Phenylephrine eye drops

Alpha-adrenergic stimulant

Indications for use
Mydriasis prior to ophthalmic examination

Preparation
2.5% Minims
Administered in conjunction with cyclopentolate eye drops

Administration

Dosage
1 drop to each eye every 20 minutes starting 1 hour before examination is due

Routes
Eyes

Compatibility

Incompatibility

Interactions

Storage
Locked medicine cupboard

Side Effects
Local reaction
Hypertension
Coronary artery spasm
Arrhythmias

Contra-indications
10% eye drops are contra-indicated in neonates

Other
Systemic absorption may occur and serious side effects are possible
Phenytoin

Anticonvulsant

### Indications for use
Seizures

### Preparation
50 mg in 1 mL injection

Add 1 mL of phenytoin 50 mg in 1 mL solution to 9 mL of sodium chloride 0.9% to produce a final concentration of 5 mg in 1 mL

6 mg in 1 mL oral suspension

### Administration

#### Dosage

**Loading dose:** 20 mg/kg single dose

**Maintenance dose:** 2.5 mg/kg 12 hourly increasing to 4 mg/kg 12 hourly

Cardiac monitoring is essential

#### Routes

**IV over 30 minutes**

Follow injection by sterile saline through catheter to reduce venous irritation

**Oral**

#### Compatibility

Sodium chloride 0.9%

Complete infusion within 1 hour

Use an in-line filter (0.22 - 0.5 micron)

#### Incompatibility

- Amphotericin
- Chloramphenicol
- Dobutamine
- Gentamicin
- Glucose 5%
- Heparin
- Insulin
- Lidocaine
- Metronidazole
- Morphine sulphate
- Parenteral nutrition
- Potassium chloride
### Interactions

<table>
<thead>
<tr>
<th>Drug</th>
<th>Interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloramphenicol</td>
<td>unstable levels rise and fall reported</td>
</tr>
<tr>
<td>Dexamethasone</td>
<td>decreased efficacy of dexamethasone</td>
</tr>
<tr>
<td>Fluconazole</td>
<td>increased phenytoin levels</td>
</tr>
<tr>
<td>Miconazole</td>
<td>increased phenytoin levels</td>
</tr>
<tr>
<td>Nifedipine</td>
<td>increased phenytoin levels</td>
</tr>
</tbody>
</table>

### Storage

Locked medicine cupboard

### Side Effects

- Arrhythmias
- Hypotension
- Hypocalcaemia
- Respiratory arrest
- Nystagmus
- Tremor
- Rash
- Megaloblastic anaemia
- Leucopenia
- Thrombocytopenia
- Agranulocytosis
- Aplastic anaemia

### Contra-indications

None absolute

### Other

- Trough levels 10 to 20 micrograms/mL
- ECG monitoring is essential during IV administration
- Severe side effects are more common if administration is too rapid
- If given by mouth, oral feeds should be interrupted for 1 to 2 hours before and after dose
# Potassium acid phosphate

**Phosphate supplement**

## Indications for use
Prevention or treatment of metabolic bone disease of prematurity

## Preparation
13.6% solution
1 mmol phosphate and 1 mmol potassium in 1 mL solution

*Intravenous infusion*
Add 2 mL of 1 mmol phosphate in 1 mL solution to 8 mL of diluent to produce a final concentration of 0.2 mmol in 1 mL

## Administration

### Dosage

**Oral dose**
1 mmol/kg once daily
Increased if phosphate levels low or alkaline phosphatase remains high

*Intravenous infusion*
Administration rate should not exceed 0.05 mmol/kg/hr unless through a central line when the rate may be increased to 0.5 mmol/kg/hr

### Routes
Oral
IV infusion

### Compatibility

### Incompatibility

### Interactions

### Storage
Locked medicine cupboard

### Side Effects
<table>
<thead>
<tr>
<th><strong>Contra-indications</strong></th>
<th>None known</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Other</strong></td>
<td>Phosphate levels are a poor indication of adequate phosphate stores as plasma phosphate may remain within normal levels despite severe metabolic bone disease</td>
</tr>
</tbody>
</table>
Potassium Canrenoate

Potassium sparing diuretic metabolised to canrenone, a metabolite of spironolactone

Indications for use
Parenteral treatment in babies unable to tolerate oral spironolactone

Preparation
20 mg in 1 mL
Add 1 mL of 20 mg in 1 mL solution to 19 mL sodium chloride 0.9% to produce a final concentration of 1 mg in 1 mL

Administration

Dosage
1 mg/kg  12 hourly

Routes
IV infusion over 30 minutes

Compatibility
Sodium chloride 0.9%

Incompatibility

Interactions
Captopril  acute hypotension, hyperkalaemia
Ibuprofen  hyperkalaemia, reduced diuretic effect
Indometacin  hyperkalaemia, reduced diuretic effect
Furosemide  acute renal failure
ACE Inhibitors  acute renal failure
Potassium supplements  hyperkalaemia
Potassium-sparing diuretics  hyperkalaemia
Digoxin  increased blood levels of digoxin

Storage
Locked medicine cupboard

Side Effects
Diarrhoea
Hyponatraemia
Hyperkalaemia
Skin rashes
Reversible increase in plasma urea and creatinine
Hyperchloraemic metabolic acidosis
Osteomalacia
Agranulocytosis
Further decrease in blood pressure in patients with low blood pressure
Contra-indications

- Acute renal failure
- Severly impaired kidney function
- Anuria
- Hyperkalaemia
- Hyponatraemia

Other

- Used with chlorothiazide or furosemide
- May interfere with digoxin assays

To convert to oral spironolactone multiply the potassium canrenoate dose in mg by 0.7 for the true equivalence. Monitor carefully and consider reducing the dose if potassium levels appear to be rising.
Potassium chloride

Essential electrolyte

Indications for use

Hypokalaemia
Prevention of potassium deficiency

Preparation

15% injection = 2 mmol K⁺ in 1 mL
1 mmol K⁺ in 1 mL oral syrup
Always check the dose carefully as overdose can be fatal

Administration

Dosage
Prescribed according to electrolyte levels

*Intravenous infusion*
Dilute at least 50 times when given as part of daily fluid and electrolyte requirements

*Urgent infusion*
Add 1 mL of potassium chloride 150 mg (2 mmol) in 1 mL to 9 mL of glucose 5% or sodium chloride 0.9% to produce a final concentration of 15 mg (0.2 mmol) in 1 mL
Potas Chlor 15mg/ml
150 mg/10 ml (15 mg/ml)

Maximum infusion rate of 0.2 mmol/kg/hour

Routes
IV infusion
Oral

Compatibility
Glucose 5%
Glucose 10%
Sodium chloride 0.9%

Incompatibility
Amphotericin
Dobutamine
Metronidazole
Phenytoin

Interactions
<table>
<thead>
<tr>
<th><strong>Storage</strong></th>
<th>Controlled drug cupboard</th>
</tr>
</thead>
</table>
| **Side Effects** | Extravasation may cause tissue necrosis  
Hypotension  
Arrhythmias  
Cardiac arrest  
Heart block  
Local reaction  
Nausea  
Vomiting  
Diarrhoea  
Gastrointestinal disturbance |
| **Contra-indications** | None absolute  
Administer with caution if cardiac dysrhythmias are present |
| **Other**     | May cause fatal cardiac arrest if administered too rapidly |
Propranolol

Blocks beta-adrenergic receptors

Indications for use
- Arrhythmias
- Hypertension
- Relaxation of the pulmonary outflow tract
- Neonatal thyrotoxicosis

Preparation
- 1 mg in 1 mL injection
- 1 mg in 1 mL oral solution

Administration

Dosage
- **Arrhythmias**
  - **Initial dose:** 20 microgram/kg IV over 10 minutes with ECG monitoring
  - Increase in increments to a cumulative total of 100 micrograms/kg
  - **Maintenance:** Administer the effective dose 6 to 8 hourly

- **Oral dose:** If administered orally, a higher dose may be needed

- **Fallot’s tetralogy**
  - **Initial dose:** 20 microgram/kg IV over 10 minutes with ECG monitoring
  - Increase in increments to a cumulative total of 100 micrograms/kg
  - **Maintenance:** Administer the effective dose 12 hourly

- **Neonatal hypertension**
  - **Oral dose:** 250 microgram/kg 8 hourly
  - Increasing as necessary to a maximum total of 2mg/kg/dose
  - May be given with hydralazine

- **Neonatal thyrotoxicosis**
  - **Oral dose:** 250 to 750 micrograms/kg 8 hourly
| **Routes** | Oral  
IV bolus over 10 minutes |
|-----------|-----------------------------|
| **Compatibility** | Glucose 5%  
Glucose 4%/sodium chloride 0.18%  
Sodium chloride 0.9% |
| **Incompatibility** | Amphotericin  
Metronidazole  
Sodium bicarbonate |
| **Interactions** | Atracurium  
duration and depth of block may be increased |
| **Storage** | Locked medicine cupboard |
| **Side Effects** | Bradycardia  
Heart failure  
Bronchospasm  
Vasoconstriction  
Gastrointestinal disturbance  
Rash |
| **Contra-indications** | None |
| **Other** | Monitor blood pressure and ECG  
Use atropine if bradycardia develops |
## Protamine sulphate

Strongly basic drug which binds with heparin to form a stable and inactive complex

### Indications for use
- To counteract the anticoagulant effects of unfractionated heparin
- It is less effective when used with low molecular weight heparin

### Preparation
- 10 mg in 1 mL injection

### Administration

<table>
<thead>
<tr>
<th>Dosage</th>
<th>1 mg neutralises 100 units of unfractionated heparin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Routes</td>
<td>IV over 10 minutes</td>
</tr>
</tbody>
</table>

### Dosage
- Dose should be reduced if more than 15 minutes have elapsed since heparin administration

### Compatibility

<table>
<thead>
<tr>
<th>Incompatibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amphotericin</td>
</tr>
<tr>
<td>Benzylpenicillin</td>
</tr>
<tr>
<td>Cefotaxime</td>
</tr>
<tr>
<td>Ceftazidime</td>
</tr>
<tr>
<td>Metronidazole</td>
</tr>
</tbody>
</table>

### Interactions

### Storage
- Locked medicine cupboard

### Side Effects
- Hypotension
- Bradycardia
- Flushing

### Contra-indications

### Other
- Protamine has an anticoagulant effect when administered in the absence of heparin
# Pyridoxine

Vitamin B₆

## Indications for use

- Control of pyridoxine dependent seizures
- Seizures of unknown origin

## Preparation

50 mg in 1 mL

## Administration

### Dosage

**Diagnosis:**
100 mg IV single dose (irrespective of weight)

Initial dose should be given under close supervision and/or EEG control while infant is convulsing

**Treatment:**
50 to 100 mg once daily

May need to be administered for 7 days or longer to establish diagnosis

### Routes

- IV bolus
- IM
- Oral

## Compatibility

### Incompatibility

- Amphotericin
- Metronidazole

## Interactions

## Storage

Locked medicine cupboard

## Side Effects

## Contra-indications

None known

## Other

Ranitidine

Histamine antagonist (H₂ receptor)

Indications for use
Treatment and prevention of gastrointestinal bleeding
Reduction of oesophagitis in gastro-oesophageal reflux

Preparation
25 mg in 1 mL injection
For intravenous bolus injection add 0.1 mL of ranitidine to 0.9 mL of glucose 5% or sodium chloride 0.9% to produce a final concentration of 2.5 mg in 1 mL
5 mg in 1 mL syrup

Administration
Dosage

<table>
<thead>
<tr>
<th>Route</th>
<th>Dosage</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV</td>
<td>1 mg/kg</td>
<td>8 hourly</td>
</tr>
<tr>
<td>Parenteral nutrition</td>
<td>3 mg/kg/day</td>
<td></td>
</tr>
<tr>
<td>Oral</td>
<td>3 mg/kg</td>
<td>8 hourly</td>
</tr>
</tbody>
</table>

Routes
IV bolus over 5 minutes
IV infusion
Oral

Compatibility
Glucose 5%
Glucose 10%
Sodium chloride 0.9%
Parenteral nutrition - clear fluids

Incompatibility
Amphotericin
Metronidazole

Interactions
Midazolam increased midazolam levels
Tolazoline effect reduced

Storage
Locked medicine cupboard
| Side Effects          | Arrhythmias  
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Diarrhoea</td>
</tr>
<tr>
<td>Contra-indications</td>
<td>None</td>
</tr>
<tr>
<td>Other</td>
<td>Slow IV injection minimises the risk of cardiac arrhythmias and bradycardia</td>
</tr>
</tbody>
</table>
Rifampicin

Rifamycin antimicrobial

**Indications for use**
Severe staphylococcal infections
Tuberculosis

**Preparation**
600 mg injection
To reconstitute add 9.6 mL of the solvent provided to 600 mg vial (displacement value 0.4 mL) to produce a solution of 600 mg in 10 mL
Add 1 mL of this solution to 9 mL glucose 5% to produce a final concentration of 6 mg in 1 mL
20 mg in mL oral syrup

**Administration**

**Dosage**
10 mg/kg 12 hourly
Oral 20mg/kg once daily
Must be given in combination with vancomycin or teicoplanin if treating staphylococcal infection or another antibiotic for tuberculosis

**Route**
IV infusion over 2 hours
Oral

**Compatibility**

**Incompatibility**
Sodium bicarbonate
Interactions

<table>
<thead>
<tr>
<th>Drug</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dexamethasone</td>
<td>reduced effect of dexamethasone</td>
</tr>
<tr>
<td>Digoxin</td>
<td>serum levels of digoxin reduced</td>
</tr>
<tr>
<td>Fluconazole</td>
<td>hypercalcaemia</td>
</tr>
<tr>
<td>Hydrocortisone</td>
<td>reduced effect of hydrocortisone</td>
</tr>
<tr>
<td>Lidocaine</td>
<td>decreased serum levels of lidocaine</td>
</tr>
<tr>
<td>Midazolam</td>
<td>increased metabolism of midazolam</td>
</tr>
<tr>
<td>Morphine</td>
<td>reduced effect of morphine</td>
</tr>
<tr>
<td>Phenobarbitone</td>
<td>increased clearance of rifampicin</td>
</tr>
<tr>
<td>Phenytoin</td>
<td>decreased serum levels of phenytoin</td>
</tr>
<tr>
<td>Propranolol</td>
<td>increased metabolism of propranolol</td>
</tr>
<tr>
<td>Thyroid hormones</td>
<td>reduced effect of thyroid hormone</td>
</tr>
</tbody>
</table>

Storage

Locked medicine cupboard

Side Effects

May exacerbate or precipitate jaundice
Fever
Skin rashes
Nausea/vomiting
Phlebitis and pain at the infusion site have been reported
Exfoliative dermatitis
Lyells syndrome and pemphigoid reactions
Diarrhoea
Pseudomembranous colitis
Hepatitis
Thrombocytopenia with or without purpura
Cerebral haemorrhage when continued or resumed after appearance of purpura
Eosinophilia, leucopenia, Oedema, muscle weakness and myopathy
Shortness of breath and wheezing
Decrease in blood pressure and shock
Acute haemolytic anaemia
Acute renal failure
Reddish discolouration of the urine, sputum and tears

Contra-indications

Other

Resistant strains of bacteria emerge quickly if rifampicin is given alone. Therefore, it should be given in combination with a second antibiotic
### Salbutamol

Beta agonist

<table>
<thead>
<tr>
<th><strong>Indications for use</strong></th>
<th>Renal hyperkalaemia</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Preparation</strong></td>
<td>1 mg in 1 mL for IV infusion</td>
</tr>
<tr>
<td></td>
<td>Add 0.2 mL of 1 mg in 1 mL solution to 19.8 mL of diluent to give a solution of 10 micrograms in 1 mL</td>
</tr>
<tr>
<td><strong>Administration</strong></td>
<td><strong>Dosage</strong> 4 micrograms/kg</td>
</tr>
<tr>
<td></td>
<td><strong>Routes</strong> IV slow bolus over 5 to 10 minutes</td>
</tr>
<tr>
<td></td>
<td><strong>Compatibility</strong> Glucose 5% Sodium chloride 0.9%</td>
</tr>
<tr>
<td></td>
<td><strong>Incompatibility</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Interactions</strong> Corticosteroids increased risk of hypokalaemia</td>
</tr>
<tr>
<td></td>
<td>Diuretics risk of hypokalaemia</td>
</tr>
<tr>
<td></td>
<td>Theophylline risk of hypokalaemia</td>
</tr>
<tr>
<td></td>
<td>Beta blockers inhibit effect of Salbutamol</td>
</tr>
<tr>
<td><strong>Storage</strong></td>
<td>Locked medicine cupboard</td>
</tr>
<tr>
<td><strong>Side Effects</strong></td>
<td>Hypokalaemia</td>
</tr>
<tr>
<td></td>
<td>Tremor</td>
</tr>
<tr>
<td></td>
<td>Tachycardia</td>
</tr>
<tr>
<td></td>
<td>Hypotension</td>
</tr>
<tr>
<td></td>
<td>Bronchospasm</td>
</tr>
<tr>
<td></td>
<td>Hyperglycaemia</td>
</tr>
<tr>
<td><strong>Contra-indications</strong></td>
<td>Caution in diabetics, ketoacidosis may occur</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Sodium bicarbonate 4.2%**

Alkalising agent

### Indications for use
Metabolic acidosis

### Preparation
4.2% solution. 10 mL ampoule

- 0.5 mmol of bicarbonate ion in 1 mL
- 0.5 mmol of sodium ion in 1 mL

### Administration

#### Dosage
*For management of acidosis:*
Dose administered should be that which has been calculated to be sufficient to half correct base deficit:

\[
\text{bodyweight (kg)} \times 0.6 \times \text{base deficit} = \text{mL required to half correct}
\]

*In emergencies: 2 to 4 mL/kg single dose* ¹

#### Routes
- IV infusion over 30 minutes
- Oral
- IO

### Compatibility
- Glucose 5%
- Glucose 10%
- Sodium chloride 0.45%
- Sodium chloride 0.9%

### Incompatibility
- Adrenaline
- Amphotericin
- Atropine
- Calcium salts
- Cefotaxime
- Dobutamine
- Dopamine
- Isoprenaline
- Magnesium sulphate
- Metronidazole
- Midazolam
- Morphine sulphate
- Parenteral nutrition
- Vancomycin
<table>
<thead>
<tr>
<th>Interactions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Storage</strong></td>
</tr>
<tr>
<td>Locked medicine cupboard</td>
</tr>
<tr>
<td><strong>Side Effects</strong></td>
</tr>
<tr>
<td>Hypokalaemia</td>
</tr>
<tr>
<td>Gastrointestinal disturbance</td>
</tr>
<tr>
<td>Spontaneous rupture of stomach</td>
</tr>
<tr>
<td>Extravasation may cause tissue necrosis</td>
</tr>
<tr>
<td>Metabolic alkalosis</td>
</tr>
<tr>
<td><strong>Contra-indications</strong></td>
</tr>
<tr>
<td>Metabolic acidosis with respiratory acidosis</td>
</tr>
<tr>
<td>Hypocalcaemia</td>
</tr>
<tr>
<td><strong>Other</strong></td>
</tr>
</tbody>
</table>

Sodium chloride

Essential electrolyte

**Indications for use**
- Hyponatraemia
- Diluent for intravenous injections
- Volume expansion
- Hypotension

**Preparation**
- 0.9% injection = 0.15 mmol Na⁺ in 1 mL
- 30% injection = 5 mmol Na⁺ in 1 mL
- 5 mmol Na⁺ in 1 mL oral solution

**Administration**

**Dosage**
- **Hyponatraemia**
  Prescribed on the basis of plasma sodium levels

- **Volume expansion**
  10 mL/kg of 0.9% as a rapid bolus

- **Hypotension**
  10 mL/kg of 0.9% as a rapid bolus over 15 to 60 minutes depending on the severity of the hypotension

**Routes**
- IV bolus
- Oral

**Compatibility**
- Glucose 5%
- Glucose 10%
- Glucose 4.0% / sodium chloride 0.18%
- Sodium chloride 0.45%
- Sodium chloride 0.9%

**Incompatibility**
- Amphotericin

**Interactions**
<table>
<thead>
<tr>
<th><strong>Storage</strong></th>
<th>Locked medicine cupboard</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Side Effects</strong></td>
<td>Hypernatraemia</td>
</tr>
<tr>
<td><strong>Contra-indications</strong></td>
<td>Hypernatraemia</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>Pre-term infants may have a high sodium loss and sodium requirements may be much higher than anticipated. Losses may change rapidly however, and close monitoring of plasma sodium is essential</td>
</tr>
</tbody>
</table>
# Sodium ferredate (Sodium ironedetate)

**Iron supplement**

<table>
<thead>
<tr>
<th>Indications for use</th>
<th>Prophylaxis of iron deficiency anaemia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparation</td>
<td>5.5 mg elemental iron in 1 mL oral liquid</td>
</tr>
<tr>
<td>Administration</td>
<td><strong>Dosage</strong>&lt;br&gt;<em>All infants born at a gestational age of &lt;34 weeks not exclusively fed on Nutriprem 1 or Nutriprem 2 starting at 4 to 6 weeks and to continue until 6 months corrected gestational age:</em>&lt;br&gt;0.5 mL once daily if &lt;1.5 kg&lt;br&gt;1 mL once daily if ≥1.5 kg&lt;br&gt;Infants who are mixed feeding need supplementation</td>
</tr>
<tr>
<td>Routes</td>
<td>Oral</td>
</tr>
<tr>
<td>Compatibility</td>
<td></td>
</tr>
<tr>
<td>Incompatibility</td>
<td></td>
</tr>
<tr>
<td>Interactions</td>
<td></td>
</tr>
<tr>
<td>Storage</td>
<td>Locked medicine cupboard</td>
</tr>
<tr>
<td>Side Effects</td>
<td>Toxic in overdose</td>
</tr>
<tr>
<td>Contra-indications</td>
<td>None</td>
</tr>
<tr>
<td>Other</td>
<td>If gastric irritation occurs, reduce the dose. Start at 0.2 mL once daily for several days then increase to 0.4 mL once daily for several days, then continue to increase until the appropriate dose is reached</td>
</tr>
</tbody>
</table>
# Spironolactone

## Potassium sparing diuretic

### Indications for use
- Oedema if long term diuretic therapy is required
- Chronic lung disease of prematurity

### Preparation
- 5 mg in 1 mL oral solution

### Administration

<table>
<thead>
<tr>
<th>Dosage</th>
<th>1 mg/kg 12 hourly</th>
</tr>
</thead>
</table>

| Routes       | Oral              |

### Compatibility

<table>
<thead>
<tr>
<th>Interactions</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Captopril</td>
<td>acute hypotension, hyperkalaemia</td>
</tr>
<tr>
<td>Ibuprofen</td>
<td>hyperkalaemia, reduced diuretic effect</td>
</tr>
<tr>
<td>Indometacin</td>
<td>hyperkalaemia, reduced diuretic effect</td>
</tr>
<tr>
<td>Furosemide</td>
<td>acute renal failure</td>
</tr>
<tr>
<td>ACE Inhibitors</td>
<td>acute renal failure</td>
</tr>
<tr>
<td>Potassium supplements</td>
<td>hyperkalaemia</td>
</tr>
<tr>
<td>Potassium-sparing diuretics</td>
<td>hyperkalaemia</td>
</tr>
<tr>
<td>Digoxin</td>
<td>increased blood levels of digoxin</td>
</tr>
</tbody>
</table>

### Storage
- Locked medicine cupboard

### Side Effects
- Diarrhoea
- Hyponatraemia
- Hyperkalaemia
- Skin rashes
- Reversible increase in plasma urea and creatinine
- Hyperchloraemic metabolic acidosis
- Osteomalacia
- Agranulocytosis
- Further decrease in blood pressure in patients with low blood pressure
<table>
<thead>
<tr>
<th>Contra-indications</th>
<th>Renal failure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hyperkalaemia</td>
</tr>
<tr>
<td></td>
<td>Anuria</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other</th>
<th>Used with chlorothiazide or furosemide</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>May interfere with digoxin assays</td>
</tr>
</tbody>
</table>
# Sucralfate ointment

Complex of aluminium hydroxide and sulphated sucrose which protects the peri-anal skin from attack by acid

<table>
<thead>
<tr>
<th>Indications for use</th>
<th>Perianal sores resistant to other topical agents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparation</td>
<td>4% ointment prepared in pharmacy</td>
</tr>
<tr>
<td>Administration</td>
<td></td>
</tr>
<tr>
<td>Dosage</td>
<td>2 to 4 times daily</td>
</tr>
<tr>
<td>Routes</td>
<td>Topical</td>
</tr>
<tr>
<td>Compatibility</td>
<td></td>
</tr>
<tr>
<td>Incompatibility</td>
<td></td>
</tr>
<tr>
<td>Interactions</td>
<td></td>
</tr>
<tr>
<td>Storage</td>
<td>Locked medicine cupboard</td>
</tr>
<tr>
<td>Side Effects</td>
<td></td>
</tr>
<tr>
<td>Contra-indications</td>
<td>Not to be used on infants under 3 weeks of age</td>
</tr>
<tr>
<td>Other</td>
<td>Amount of absorption of active ingredient is unknown</td>
</tr>
</tbody>
</table>
## Sucrose 24% (Sweet-Ease)

<table>
<thead>
<tr>
<th><strong>Indications for use</strong></th>
<th>Relief of pain associated with procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Preparation</strong></td>
<td>24% sucrose solution. Available in pre-packed cartons (11 mL)</td>
</tr>
</tbody>
</table>
| **Administration**      | **Dosage**  
For infants requiring intensive care  
0.1 mL onto tongue directly  
Alternatively drip 0.1 mL onto gloved finger or pacifier for infant to suck  
  
For preterm infants on full feeds  
0.5 to 1 mL orally over 30 to 60 seconds  
  
For term infants  
1 to 2 mL orally over 30 to 60 seconds  
  
For all infants, administer 2 minutes before procedure. Oral sucrose effect is enhanced if followed by a pacifier/gloved finger to suck on. If procedure is prolonged (>5mins), a repeat dose can be considered  
  
Allow up to 4 doses per day per infant routinely. Further doses should be discussed with medical staff  
  
**Routes**  
Give orally rather than via nasogastric tube as effect is taste mediated  
  
**Compatibility**  
  
**Incompatibility**  
  
**Interactions**  
  
**Storage**  
  
**Side Effects**  
Potential for increase in serum glucose levels transiently
**Contra-indications**
Do not administer more than 1 drop directly into the mouth if significant respiratory distress, or poor suck due to neurological depression/sedation as potential risk of aspiration

Significant hyperglycaemia despite insulin

**Other**
Sucrose has been shown to reduce distress associated with painful procedures in some studies

Effect is potentiated by combining with subsequent use of pacifier/dummy. A large randomised controlled trial has suggested that the analgesic effect is associated with non-nutritive sucking, and sucrose adds no additional benefit

Peak effect is 2 minutes after administration probably secondary to endogenous endorphin release

---

### Tazocin

Piperacillin with Tazobactam. Broad spectrum antibiotic

<table>
<thead>
<tr>
<th>Indications for use</th>
<th>Pseudomonas aeruginosa</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Preparation</strong></td>
<td>4.5 g vial containing piperacillin 4 g with Tazobactam 0.5 g</td>
</tr>
<tr>
<td></td>
<td>To reconstitute add 36.85 mL of water for injections to 4.5 g vial (displacement value 3.15 mL) to produce a final concentration of 113 mg in 1 mL (piperacillin 100 mg with tazobactam 13 mg)</td>
</tr>
</tbody>
</table>

#### Administration

<table>
<thead>
<tr>
<th>Dosage</th>
<th>90 mg/kg</th>
<th>8 hourly if &lt; 28 days</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6 hourly if &gt; 28 days</td>
<td></td>
</tr>
<tr>
<td>Routes</td>
<td>IV infusion over 30 minutes</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Compatibility</th>
<th>Glucose 5%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sodium chloride 0.9%</td>
</tr>
<tr>
<td></td>
<td>Parenteral nutrition - clear fluids</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Incompatibility</th>
<th>Aminoglycosides</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Amphotericin</td>
</tr>
<tr>
<td></td>
<td>Atracurium</td>
</tr>
<tr>
<td></td>
<td>Fluconazole</td>
</tr>
<tr>
<td></td>
<td>Vancomycin</td>
</tr>
</tbody>
</table>

| Interactions | Neuromuscular blocking agents – prolonged action |

| Storage       | Locked medicine cupboard |

Side Effects

- Leucopenia
- Renal impairment
- Hepatic dysfunction
- Cholestatic jaundice
- Haemolysis
- Local reaction
- Diarrhoea
- Rash
- Erythema
- Pruritis
- Vomiting
- Allergic reactions
- Convulsions
- Hypotension
- Fever
- Flushing
- Oedema
- Eosinophilia
- Thrombocytopenia
- Positive Coombs test
- Hypokalaemia

Contra-indications

- History of allergic reaction to any penicillins
- Cephalosporins or beta lactamase inhibitors

Other
**Teicoplanin**

Glycopeptide antibiotic similar to vancomycin but with a longer duration of action and reduced renal toxicity

<table>
<thead>
<tr>
<th><strong>Indications for use</strong></th>
<th>Coagulase negative staphylococci</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Preparation</strong></td>
<td>200 mg vial of dry powder</td>
</tr>
<tr>
<td></td>
<td>To reconstitute add the entire contents of the water for injections ampoule supplied and roll the vial gently until the powder is completely dissolved, taking care to avoid foaming. This produces a solution containing 67 mg in 1 mL. Add 1.5 mL of this solution to 8.5 mL sodium chloride 0.9% to produce a final concentration on 10 mg in 1 mL</td>
</tr>
<tr>
<td><strong>Administration</strong></td>
<td></td>
</tr>
</tbody>
</table>
| **Dosage**             | Loading: 16 mg/kg  
|                        | Maintenance: 8 mg/kg once daily  
|                        | Reduce dose in renal impairment |
| **Routes**             | IV infusion over 30 minutes |
| **Compatibility**      | Glucose 5%  
|                        | Sodium chloride 0.9% |
| **Incompatibility**    | Aminoglycosides  
|                        | Amphotericin  
|                        | Ceftazidime  
|                        | Metronidazole |
| **Interactions**       |  
| **Storage**            | Locked medicine cupboard |
**Side Effects**

- Hypotension
- Leucopenia
- Hypokalaemia
- Anaphylaxis
- Hearing damage
- Pain
- Local reaction
- Increase in urea and creatinine

---

**Contra-indications**

None

---

**Other**

Monitoring of levels is not usually required but may be indicated in extremely immature infants

*However, evidence has grown that serious infections do require a minimum serum level otherwise there is an increased risk of clinical failure. When checked, patients are often under-treated using recommended doses. If a baby is already on teicoplanin when transferred to NICU, this should be changed to Vancomycin unless the baby is near the end of the prescribed course and has improved on teicoplanin (Christine Bates, Consultant Microbiologist, RHH)*

Peak levels 60 minutes after dose

- Trough: \( >10 \text{ mg/L} \) (20 mg/mL for staph aureus infections)
- Peak: \( 25 \text{ to } 50 \text{ mg/L} \)

Measurements may be difficult to arrange – contact manufacturer for details
Tetracaine (Amethocaine)

Local anaesthetic gel

Indications for use

- Local anaesthetic gel for topical application
- Suitable for cannulation, venepuncture, ventricular and lumbar puncture
- Not effective for heel prick analgesia

Preparation

- 4% gel provided in a 1.5g tube, equivalent to 3 separate doses

Administration

Dosage

- Drop of gel onto skin surface. Cover with Tegaderm or equivalent occlusive dressing
- Apply one tube to up to 3 sites
- No more than 1 tube in 24 hours
- Minimum application time 30 minutes
- Maximum application time 1 hour
- Effect lasts for 1 to 5 hours

Routes

- Topical application only

Compatibility

Incompatibility

Interactions

Storage

- Locked refrigerator at 2° to 8° C

Side Effects

- Erythema
- Oedema
- Pruritis
- Rarely: blistering

Contra-indications

- Not to be used in infants below 28 weeks in first week of life
- Not to be used over damaged skin
- Not useful for heel pricks
Ametop has been shown to be effective particularly for venepuncture. Although use of Ametop has been associated with skin erythema with prolonged exposure and occasional blistering, research studies have not indicated significant risk with preterm infants.

Tolazoline

Vasodilator thought to act through H₂ histamine receptors

**Indications for use**

Persistent pulmonary hypertension

**Preparation**

25 mg in 1 mL ampoules

**Administration**

**Dosage**

*Loading dose*¹
1 mg/kg over 2 minutes observing for hypotension

*Maintenance dose (if necessary)*
200 micrograms/kg/hour
Add 1 mL of tolazoline 25 mg in 1 mL to 49 mL of glucose 5% or sodium chloride 0/9% to produce a final concentration of 0.5 mg in 1 mL
ToLAZolin 500mcg/ml
25 mg/50 ml (0.5 mg/ml)

*Via endotracheal tube*
Isolated reports have suggested that a beneficial effect may be seen if given via ET tube at a dose of 200 micrograms/kg diluted in 0.5 mL to 1 mL of sodium chloride 0.9%. Only to be used if no effect when using conventional route and only with consultant approval

**Routes**

Bolus for test dose
Continuous IV infusion

**Compatibility**

Glucose 5%
Glucose 10%
Glucose 4.0% / sodium chloride 0.18%
Sodium chloride 0.9%

**Incompatibility**

Amphotericin
Indomethacin
Metronidazole

**Interactions**

Cimetidine reduces the effect of tolazoline
Ranitidine reduces the effect of tolazoline

**Storage**

Locked medicine cupboard
Side Effects

- Hypotension
- Flushing
- Gastrointestinal bleeding

Contra-indications

None

Other

Acidosis must be corrected prior to administration.

Profound hypotension may occur. Before tolazoline is given steps must be taken to ensure that low blood pressure can be treated immediately with either volume replacement or inotropes.

# Trimethoprim

Inhibits bacterial folic acid synthesis

## Indications for use
- Treatment and prophylaxis of urinary tract infections
- Infections sensitive to trimethoprim where there is resistance to more commonly used antibiotics

## Preparation
10 mg in 1 mL oral suspension

## Administration

<table>
<thead>
<tr>
<th>Dosage</th>
<th>Loading dose:</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 mg/kg oral</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Maintenance dose:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 mg/kg 12 hourly if &lt; 6 weeks of age</td>
</tr>
<tr>
<td>4 mg/kg 12 hourly if ≥ 6 weeks of age</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Prophylaxis of UTI:</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 mg/kg once daily, usually given at night</td>
</tr>
</tbody>
</table>

### Routes
- Oral

### Compatibility

### Incompatibility

### Interactions

### Storage
- Locked medicine cupboard

### Side Effects
- Pruritis
- Rash
- Nausea
- Vomiting
- Anaemia
<table>
<thead>
<tr>
<th>Contra-indications</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other</td>
<td>Regular haematological investigation should be performed if receiving a prolonged course</td>
</tr>
</tbody>
</table>
**Trometamol (Tham)**

Organic buffer

<table>
<thead>
<tr>
<th><strong>Indications for use</strong></th>
<th>Metabolic acidosis. Only to be used if there is a specific reason why sodium bicarbonate cannot be used</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Preparation</strong></td>
<td>1 molar solution</td>
</tr>
<tr>
<td></td>
<td>1 mL of trometamol = approx 1 mmol of sodium bicarbonate</td>
</tr>
<tr>
<td></td>
<td>Use undiluted (may be diluted with HAS for injection into the umbilical cord)</td>
</tr>
<tr>
<td><strong>Administration</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Dosage</strong></td>
<td>Dose to half correct acidosis</td>
</tr>
<tr>
<td></td>
<td>bodyweight (kg) x 0.3 x base deficit = mL required to half correct</td>
</tr>
<tr>
<td><strong>Routes</strong></td>
<td>Intravenous infusion over 30 minutes</td>
</tr>
<tr>
<td></td>
<td>Must not be administered undiluted via the umbilical vein</td>
</tr>
<tr>
<td><strong>Compatibility</strong></td>
<td>Glucose 10%</td>
</tr>
<tr>
<td></td>
<td>HAS</td>
</tr>
<tr>
<td><strong>Incompatibility</strong></td>
<td>Amphotericin</td>
</tr>
<tr>
<td></td>
<td>Calcium salts</td>
</tr>
<tr>
<td></td>
<td>Metronidazole</td>
</tr>
<tr>
<td><strong>Interactions</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Storage</strong></td>
<td>Locked medicine cupboard</td>
</tr>
<tr>
<td><strong>Side Effects</strong></td>
<td>Apnoea</td>
</tr>
<tr>
<td></td>
<td>Hypoglycaemia</td>
</tr>
<tr>
<td></td>
<td>Local reaction</td>
</tr>
<tr>
<td></td>
<td>Extravasation may cause tissue necrosis</td>
</tr>
<tr>
<td><strong>Contra-indications</strong></td>
<td>None</td>
</tr>
</tbody>
</table>
Other

75% is excreted unchanged in the urine within 8 hours. Use with caution in impaired renal function. Caution in chronic respiratory acidosis

There are no published data confirming efficacy of trometamol in the treatment of metabolic acidosis. In addition it delivers an even greater osmolar load than sodium bicarbonate
### Vancomycin

Glycopeptide antibiotic

#### Indications for use
Treatment of resistant staphylococci, particularly staphylococcus epidermidis

#### Preparation
500 mg vial of dry powder

To reconstitute add 8 mL of water for injections to 500 mg. Draw up all the solution from the vial and make up to 10 mL with glucose 5% to produce a concentration of 50 mg in 1 mL.

Add 1 mL of Vancomycin 50 mg in 1 mL to 9 mL of glucose 5% or sodium chloride 0.9% to produce a final concentration of 5 mg in 1 mL

#### Administration

<table>
<thead>
<tr>
<th>Dosage</th>
<th>Routes</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 mg/kg</td>
<td>IV infusion over 60 minutes</td>
</tr>
<tr>
<td>24 hourly if &lt; 29 weeks</td>
<td></td>
</tr>
<tr>
<td>12 hourly if 29 - 35 weeks</td>
<td></td>
</tr>
<tr>
<td>8 hourly if &gt; 35 weeks</td>
<td></td>
</tr>
</tbody>
</table>

#### Compatibility
- Glucose 5%
- Sodium chloride 0.9%
- TPN – clear fluids

#### Incompatibility
- Aminophylline
- Amphotericin
- Aztreonam
- Benzylpenicillin
- Cefotaxime
- Ceftazidime
- Chloramphenicol
- Dexamethasone
- Heparin
- Human albumin solution
- Hydrocortisone sodium phosphate
- Metronidazole
- Phenobarbital
- Sodium bicarbonate
- Tazocin
Interactions

Gentamicin increased risk of ototoxicity and nephrotoxicity

Storage

Locked medicine cupboard

Side Effects

Ototoxicity
Urticaria
Hypotension
Flushing
Local reaction
Muscle spasm
Leucopenia
Renal impairment
Thrombocytopenia
Extravasation may cause tissue necrosis

Contra-indications

None known

Other

Levels should be measured on the third dose. Blood should be taken immediately before the infusion and one hour after completion

Trough: 5 - 10 micrograms/mL
Peak: 25 - 40 micrograms/mL
# Varicella-zoster immunoglobulin

Obtained from plasma from selected donors having specific antibodies against herpes virus varicella (chicken pox)

## Indications for use

Passive immunisation against varicella for neonates whose mothers develop chicken pox seven days before delivery or up to seven days after delivery

Varicella zoster antibody negative infants exposed to chicken pox or herpes zoster while still requiring intensive or prolonged special care nursing.

## Preparation

Available from Public Health Laboratory during working hours only

## Administration

### Dosage

250 mg within 10 days of exposure

Give a second dose if further exposure occurs and three weeks have elapsed since first dose.

### Routes

IM

## Compatibility

None

## Incompatibility

None

## Interactions

None

## Storage

Locked refrigerator at 2°C to 8°C

## Side Effects

- Anaphylaxis
- Flushing
- Headache
- Fever
- Chills

## Contra-indications

None
Other

Does not prevent infection when given after exposure but may modify the course of disease

Live vaccines should not normally be given until three months after a dose of immunoglobulin or if immunoglobulin is to be given within the following three weeks

Shingles during pregnancy presents little hazard to the baby
varicella-zoster immune globulin is not indicated

1 Health Protection Agency. Immunoglobulin Handbook. June 2004
### Vitamin D (Calciferol)

Controls calcium and phosphate absorption from the intestine and mobilisation from bone

<table>
<thead>
<tr>
<th>Indications for use</th>
<th>There is normally adequate vitamin D in the milk and standard multi-vitamin drops administered. Extra vitamin D should not be required. May be indicated if metabolic bone disease develops despite adequate phosphate supplementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparation</td>
<td>Oral solution</td>
</tr>
<tr>
<td>Dosage</td>
<td>3,000 units in 1 mL</td>
</tr>
<tr>
<td>Administration</td>
<td>600 units (0.2 mL) independent of weight, once daily</td>
</tr>
<tr>
<td>Routes</td>
<td>Oral</td>
</tr>
<tr>
<td>Compatibility</td>
<td></td>
</tr>
<tr>
<td>Incompatibility</td>
<td></td>
</tr>
<tr>
<td>Interactions</td>
<td></td>
</tr>
<tr>
<td>Storage</td>
<td>Locked medicine cupboard</td>
</tr>
<tr>
<td>Side Effects</td>
<td></td>
</tr>
<tr>
<td>Contra-indications</td>
<td>None known</td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
</tbody>
</table>
Vitamin K₁ (Phytomenadione)

Co-factor in the synthesis of blood clotting factors

Indications for use
Prevention and treatment of haemorrhagic disease of the newborn

Preparation
2 mg in 0.2 mL (Konakion MM Paediatric) for IM, IV or oral administration
1 mg capsules (Orakay)

Administration

Dosage

- **Healthy neonates of 36 weeks and over**
  - IM
  - 1 mg of Konakion MM Paediatric at birth – one dose only

  *If IM is declined an oral regime may be used*

  - Oral
  - 2 mg of Konakion MM Paediatric at birth, followed by:
    - Breast fed infants: 1 mg of Orakay at 7 and 28 days
    - Bottle fed infants: 1 mg of Orakay at day 7

- **< 36 weeks gestation weighing \geq 2.5 kg and term neonates at special risk**
  - 1 mg IM or IV at birth (Konakion MM Paediatric)

  *If given IV then further oral dose of:*
  - Breast fed infants: 1 mg of Orakay at 7 and 28 days
  - Bottle fed infants: 1 mg of Orakay at day 7

- **< 36 weeks gestation weighing < 2.5 kg**
  - 0.4 mg/kg IM or IV at birth (Konakion MM Paediatric)

  *If given IV then further oral dose of:*
  - Breast fed infants: 1 mg of Orakay at 7 and 28 days
  - Bottle fed infants: 1 mg of Orakay at day 7

Routes

- Oral
- IV bolus
- IM
<table>
<thead>
<tr>
<th>Compatibility</th>
<th>Glucose 5%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incompatibility</td>
<td></td>
</tr>
<tr>
<td>Interactions</td>
<td></td>
</tr>
<tr>
<td>Storage</td>
<td>Locked medicine cupboard</td>
</tr>
<tr>
<td>Side Effects</td>
<td>Anaphylaxis</td>
</tr>
<tr>
<td>Contra-indications</td>
<td>None absolute</td>
</tr>
<tr>
<td>Other</td>
<td>Do not dilute</td>
</tr>
<tr>
<td>Do not mix with any other medication</td>
<td></td>
</tr>
<tr>
<td>When using the glass ampoules, the solution should be drawn up using a filter needle, even for oral administration</td>
<td></td>
</tr>
<tr>
<td>For administration using the plastic capsules the end of the capsule should be cut off and the contents of the capsule drawn into a syringe or emptied onto a sterilised teaspoon if given by parents</td>
<td></td>
</tr>
</tbody>
</table>
Zidovudine

A thymidine analogue which inhibits viral DNA synthesis and viral replication

Indications for use
Prevention of materno-fetal HIV transmission

Preparation

*Oral syrup*
10 mg in 1 mL sugar free oral solution

*IV injection*
10 mg in 1 mL vial

Add 1 mL of zidovudine to 4 mL of glucose 5% or sodium chloride 0.9% to produce a final concentration of 2 mg in 1 mL

Administration

Dosage

**Term infant**

<table>
<thead>
<tr>
<th>Route</th>
<th>Dosage</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>4 mg/kg</td>
<td>12 hourly</td>
</tr>
<tr>
<td>IV</td>
<td>1.5 mg/kg</td>
<td>6 hourly</td>
</tr>
</tbody>
</table>

30 - 34 weeks gestation

<table>
<thead>
<tr>
<th>Route</th>
<th>Dosage</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>2 mg/kg</td>
<td>12 hourly for the first 2 weeks then 2 mg/kg 8 hourly to completion</td>
</tr>
<tr>
<td>IV</td>
<td>1.5 mg/kg</td>
<td>12 hourly</td>
</tr>
</tbody>
</table>

< 30 weeks gestation

<table>
<thead>
<tr>
<th>Route</th>
<th>Dosage</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>2 mg/kg</td>
<td>12 hourly for 4 weeks</td>
</tr>
<tr>
<td>IV</td>
<td>1.5 mg/kg</td>
<td>12 hourly</td>
</tr>
</tbody>
</table>

Must be started within 12 hours of birth and continued to 4 weeks of age

For premature infants triple therapy should be considered

Routes

*Oral*
*IV infusion over 30 minutes*

Compatibility

Glucose 5%
Sodium chloride 0.9%

Incompatibility

Amphotericin
Metronidazole
**Interactions**  
Stavudine – intracellular activation of stavudine is inhibited

**Storage**  
Locked medicine cupboard

**Side Effects**  
Anaemia  
Nausea  
Headache  
Leucopenia  
Lactic acidosis

**Contra-indications**  
Hyperbilirubinaemia requiring treatment other than phototherapy  
Increased transaminase levels of more than 5 times normal values

**Other**  
Blood tests should be carried out every 2 weeks because of the possibility of haematological toxicity  
Every case should be discussed individually antenatally with the paediatric infectious diseases consultant. Any drug administration should be under joint supervision  
In the United Kingdom breast feeding is contra-indicated in mothers infected with HIV

---

Preparation of varying strengths of glucose solutions

<table>
<thead>
<tr>
<th>Strength of solution required</th>
<th>500mL volumes</th>
<th>Volume of 50% glucose</th>
<th>Volume of 10% glucose</th>
</tr>
</thead>
<tbody>
<tr>
<td>10%</td>
<td>500 mL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.5%</td>
<td>30 mL</td>
<td>470 mL</td>
<td></td>
</tr>
<tr>
<td>15%</td>
<td>60 mL</td>
<td>440 mL</td>
<td></td>
</tr>
<tr>
<td>20%</td>
<td>120 mL</td>
<td>380 mL</td>
<td></td>
</tr>
<tr>
<td>25%</td>
<td>190 mL</td>
<td>310 mL</td>
<td></td>
</tr>
<tr>
<td>30%</td>
<td>250 mL</td>
<td>250 mL</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>50mL volumes</th>
<th>Volume of 50% glucose</th>
<th>Volume of 10% glucose</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.5%</td>
<td>3 mL</td>
<td>47 mL</td>
</tr>
<tr>
<td>15%</td>
<td>6 mL</td>
<td>44 mL</td>
</tr>
<tr>
<td>20%</td>
<td>12 mL</td>
<td>38 mL</td>
</tr>
<tr>
<td>25%</td>
<td>19 mL</td>
<td>31 mL</td>
</tr>
<tr>
<td>30%</td>
<td>25 mL</td>
<td>25 mL</td>
</tr>
</tbody>
</table>
### Prescription writing standards for neonates

<table>
<thead>
<tr>
<th>1. Think before you write</th>
<th>2. General rules</th>
<th>3. Approved names of drugs</th>
<th>4. Dose</th>
<th>5. Route of administration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before prescribing check the Neonatal Pharmacopoeia, the BNFC or Medicines For Children and consider:</td>
<td>If the prescription is not computer generated always write legibly in capital letters for all drug names. Use permanent black ink only.</td>
<td>Drugs should be prescribed using approved Recommended International Non-Proprietary names. (rINN) as in the pharmacopoeia e.g. amoxicillin not amoxycillin (BAN) Exceptions are adrenaline and noradrenaline which can use British Approved Name (BAN)</td>
<td>Always prescribe dosage units in full i.e. units</td>
<td>Approved abbreviations are: -</td>
</tr>
<tr>
<td>1. Allergies or sensitivity – always record on the patient’s record.</td>
<td>Always specify full instructions for dosage and administration- “as directed” or “when required” are not sufficient.</td>
<td>Do not abbreviate e.g. KCl, NaCl, Ca supplements are not acceptable</td>
<td>micrograms</td>
<td>IV intravenous</td>
</tr>
<tr>
<td>2. Cautions or contra-indications</td>
<td>Check patients details are correct e.g. Name Hospital Number</td>
<td>Always specify strength of preparation</td>
<td>Nanograms</td>
<td>IM intramuscular</td>
</tr>
<tr>
<td>3. Drug interactions (remember to check all supplementary prescription charts)</td>
<td></td>
<td>When using decimals, write a zero in front of the decimal point e.g. 0.5 mL</td>
<td>Accepted abbreviations:</td>
<td>SC subcutaneous</td>
</tr>
<tr>
<td>4. Pre-existing conditions</td>
<td></td>
<td>Trailing zeros must be avoided e.g. 5 mL, not 5.0 mL</td>
<td>mg milligrams</td>
<td>ET endotracheal</td>
</tr>
<tr>
<td>5. Renal &amp; hepatic function</td>
<td></td>
<td></td>
<td>mL millilitre</td>
<td>IO intraosseous</td>
</tr>
<tr>
<td>6. Patient’s gestation, age and weight</td>
<td></td>
<td></td>
<td>g gram</td>
<td>Neb via nebuliser</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>kg kilograms</td>
<td>Inhal by inhalation</td>
</tr>
</tbody>
</table>

### 6. Times of administration

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Always write times of administration.</td>
<td>Inpatient prescriptions: Cancellations must always be signed and dated. Cross through both the prescription details and the administration boxes.</td>
<td>Inpatient prescriptions Inpatient drug cards become invalid when the space to record administrations is filled</td>
<td>Inpatient prescriptions Alterations must not be made to prescriptions</td>
<td>The whole prescription must be signed and dated by the prescriber. The prescription must always state in the prescribers handwriting</td>
</tr>
<tr>
<td>1. As required Always state dose and frequency (minimum dose interval) and maximum daily dose</td>
<td>Discharge/ outpatient prescriptions Always specify the number of days treatment or total quantity to be prescribed.</td>
<td>When rewriting inpatient drug cards always state the date the drug was started not the date the drug card was rewritten. If the patient was on a drug prior to admission please endorse “OA” in the start date box to indicate that the patient was taking this drug “On Admission”.</td>
<td>Inpatient prescriptions Alterations must not be made to prescriptions Each change of dose, route etc must be written as a new prescription in order to avoid ambiguity and consequent errors in administration</td>
<td>1. Name and address of patient 2. Name, strength &amp; form of preparation e.g. morphine sulphate oral solution 0.1mg in 1 mL</td>
</tr>
<tr>
<td>2. Regular Think about time of oral medication in relation to meals e.g. NSAID with/after feeds Flucloxacillin before feeds/on empty stomach</td>
<td>Primary Care A record of the prescription should be included in the patient’s records. Always specify the number of days treatment or total quantity to be prescribed</td>
<td>Primary Care All prescriptions must be re-written and signed by an authorised prescriber</td>
<td>Primary Care Handwritten alterations should only be made in exceptional circumstances- it is preferable to print out a new prescription</td>
<td>3. Dose (as directed is not acceptable) 4. Quantity in words and figures, either written as: total quantity of the preparation or the number and strength of dose units</td>
</tr>
<tr>
<td>Approved abbreviations are:</td>
<td></td>
<td><em>Phenobarbitone is exempt from the handwriting requirements but phenobarbitone must have a handwritten date / date stamp.</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OM once daily in the morning</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ON once daily at night</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>BD twice a day</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>TDS three times a day</td>
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<td></td>
</tr>
<tr>
<td>QDS four times a day</td>
<td></td>
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</tr>
</tbody>
</table>

Failure to comply with these standards may result in treatment delay or a medication error. Nursing / pharmacy staff should seek clarification of all ambiguous or illegible prescriptions. Adapted from NHS South Yorkshire and original standards designed by Louise Freeman-Parry, Pharmacy Modernisation Manager, Sheffield Teaching Hospitals NHS Foundation Trust. Endorsed by South Yorkshire Patient Safety Coalition. Review Date: 9th Edition February 2008
## Drugs for the Emergency Treatment of Inborn Errors of Metabolism – Jessop Wing

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dose</th>
<th>Administration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arginine Injection 210mg in 1mL</td>
<td>Loading dose 300 mg/kg</td>
<td>Add 5mL of arginine 210 mg in 1 mL to 5.5mL glucose 10% to give a solution of 100 mg in 1mL</td>
</tr>
<tr>
<td></td>
<td>Then continuous infusion</td>
<td>Infuse 3 mL/kg (300 mg/kg) over 90 minutes</td>
</tr>
<tr>
<td>1. Diagnosis unknown</td>
<td>2. OTC/CPS</td>
<td>Use same solution or a 1:1 dilution in glucose 10% for continuous infusion</td>
</tr>
<tr>
<td>2. Citrullinaemia/ASA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biotin injection 5 mg in 1mL</td>
<td>10 mg loading dose.</td>
<td>IV bolus over 5 minutes</td>
</tr>
<tr>
<td></td>
<td>Discuss maintenance dose</td>
<td></td>
</tr>
<tr>
<td></td>
<td>with metabolic team</td>
<td></td>
</tr>
<tr>
<td>Carnitine Injection 200 mg in 1mL</td>
<td>Loading dose 100 mg/kg</td>
<td>Add 5 mL of carnitine 200 mg in 1 mL to 5 mL glucose 5% to give a solution of 100 mg in 1 mL</td>
</tr>
<tr>
<td></td>
<td>Then Continuous infusion</td>
<td>Infuse 1 mL/kg (100 mg/kg) over 10 minutes</td>
</tr>
<tr>
<td></td>
<td>4 mg/kg/hour</td>
<td>Take 0.5 mL of 200mg in 1mL solution and add to 9.5 mL of Glucose 5% to make a solution of 10 mg in 1 mL Use this solution for the continuing infusion</td>
</tr>
<tr>
<td>Hydroxocobalamin 1 mg in 1mL</td>
<td>1 mg loading dose</td>
<td>IM injection</td>
</tr>
<tr>
<td></td>
<td>Discuss maintenance dose</td>
<td></td>
</tr>
<tr>
<td></td>
<td>with metabolic team</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sodium benzoate injection</td>
<td>Loading dose 250 mg/kg</td>
<td>Add 5mL of sodium benzoate 200 mg in 1 mL to 15 mL glucose 10% to give a solution of 50 mg in 1mL</td>
</tr>
<tr>
<td>200 mg in 1 mL</td>
<td>Then Continuous infusion</td>
<td>Infuse 5 mL/kg (250 mg/kg) over 90 minutes</td>
</tr>
<tr>
<td></td>
<td>250 to 500 mg/kg/day</td>
<td>Use same solution or a 1:1 dilution in glucose 10% for continuous infusion</td>
</tr>
<tr>
<td>Sodium phenylbutyrate injection</td>
<td>Loading dose 250 mg/kg</td>
<td>Add 5 mL of sodium phenylbutyrate 200 mg in 1 mL to 15 mL glucose 10% to give a solution of 50 mg in 1mL</td>
</tr>
<tr>
<td>200 mg in 1 mL</td>
<td>Then Continuous infusion</td>
<td>Infuse 5 mL/kg (250 mg/kg) over 90 minutes</td>
</tr>
<tr>
<td></td>
<td>250 to 500 mg/kg/day</td>
<td>Use same solution or a 1:1 dilution in glucose 10% for continuous infusion</td>
</tr>
<tr>
<td>Carglumic acid Dispersible</td>
<td>70 mg/kg to 200mg/kg</td>
<td>Tables may be halved and quartered, or dissolved in 10ml of water and required volume given</td>
</tr>
<tr>
<td>tablets 200mg</td>
<td>Seek specialist advice for</td>
<td></td>
</tr>
<tr>
<td></td>
<td>indication and for further</td>
<td></td>
</tr>
<tr>
<td></td>
<td>daily doses</td>
<td></td>
</tr>
</tbody>
</table>

**NOT IN BOX – available from Children’s Hospital – stored in fridge and not returnable – (£263 for 5 tablets)**

Arginine, carnitine, sodium benzoate and sodium phenylbutyrate should be infused at the same time. All may be infused through the same iv line but it may be easier to infuse sodium benzoate and sodium phenylbutyrate together at one site and arginine and carnitine at another

(ref. MFC2003, NF 4, 2003)

**This guideline is intended as a guide for treating patients with metabolic disease. Always seek specialist advice**

Reference - Sheffield Children’s Hospital (July 2006)
### Data Set Report

**Hospital:** Sheffield Jessop  
**Data Set Name:** Sheffield Jessop NICU  
**Version:** 11  
**Status:** Released  
**Date:** 25/10/2007  
**Asena Syringe Pump Models Enabled:** CC

#### Master Drug List

<table>
<thead>
<tr>
<th>Drug Name</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADREnaline 60mcg/ml</td>
<td>1200 µg/20 ml (60 µg/ml)</td>
</tr>
<tr>
<td>ADREnaline200mcg/ml</td>
<td>4000 µg/20 ml (200 µg/ml)</td>
</tr>
<tr>
<td>ALprostad 1000ng/ml</td>
<td>50 µg/50 ml (1 µg/ml)</td>
</tr>
<tr>
<td>ALprostad 4000ng/ml</td>
<td>200 µg/50 ml (4 µg/ml)</td>
</tr>
<tr>
<td>AminoPHYline 1mg/ml</td>
<td>50 mg/50 ml (1 mg/ml)</td>
</tr>
<tr>
<td>ATRacurium 1mg/ml</td>
<td>20 mg/20 ml (1 mg/ml)</td>
</tr>
<tr>
<td>Clonaz 100mcg/ml</td>
<td>1000 µg/10 ml (100 µg/ml)</td>
</tr>
<tr>
<td>DoBUTam 1200mcg/ml</td>
<td>60 mg/50 ml (1.2 mg/ml)</td>
</tr>
<tr>
<td>DoBUTam 2400mcg/ml</td>
<td>120 mg/50 ml (2.4 mg/ml)</td>
</tr>
<tr>
<td>DOPamine 1200mcg/ml</td>
<td>60 mg/50 ml (1.2 mg/ml)</td>
</tr>
<tr>
<td>DOPamine 2400mcg/ml</td>
<td>120 mg/50 ml (2.4 mg/ml)</td>
</tr>
<tr>
<td>FENTanyl 2.5mcg/ml</td>
<td>20 µg/8 ml (2.5 µg/ml)</td>
</tr>
<tr>
<td>FLEcainide200mcg/ml</td>
<td>10 mg/50 ml (0.2 mg/ml)</td>
</tr>
<tr>
<td>Glucose 10%</td>
<td>-- ml/-- ml</td>
</tr>
<tr>
<td>Glucose 5%</td>
<td>-- ml/-- ml</td>
</tr>
<tr>
<td>HepSal PERIPHERAL</td>
<td>50 U/50 ml (1 U/ml)</td>
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<tr>
<td>HepSal UAC</td>
<td>50 U/50 ml (1 U/ml)</td>
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<tr>
<td>HYdralazin 20mcg/ml</td>
<td>1000 µg/50 ml (20 µg/ml)</td>
</tr>
<tr>
<td>Insulin 0.1 Unit/ml</td>
<td>5 U/50 ml (0.1 U/ml)</td>
</tr>
<tr>
<td>Insulin 0.2 Unit/ml</td>
<td>10 U/50 ml (0.2 U/ml)</td>
</tr>
<tr>
<td></td>
<td>Concentration</td>
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<tr>
<td>------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>ISOpren 12000ng/ml</td>
<td>120 µg/10 ml (12 µg/ml)</td>
</tr>
<tr>
<td>LIDOcain 2000mcg/ml</td>
<td>20 mg/10 ml (2 mg/ml)</td>
</tr>
<tr>
<td>LiPID</td>
<td>-- ml/-- ml</td>
</tr>
<tr>
<td>Midazolam 100mcg/ml</td>
<td>2 mg/20 ml (0.1 mg/ml)</td>
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<tr>
<td>MORphine 100mcg/ml</td>
<td>3 mg/30 ml (0.1 mg/ml)</td>
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<tr>
<td>MORphine 50mcg/ml</td>
<td>1.5 mg/30 ml (0.05 mg/ml)</td>
</tr>
<tr>
<td>Octreotide 5mcg/ml</td>
<td>50 µg/10 ml (5 µg/ml)</td>
</tr>
<tr>
<td>Potas Chlor 15mg/ml</td>
<td>150 mg/10 ml (15 mg/ml)</td>
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</table>

Enabled Syringe List

<table>
<thead>
<tr>
<th>Make</th>
<th>Enabled Models</th>
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</thead>
<tbody>
<tr>
<td>BD Plastipak</td>
<td>5ml, 10ml, 20ml, 50ml</td>
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</tbody>
</table>
### Drug Library: < 1Kg

<table>
<thead>
<tr>
<th>Drug Name</th>
<th>Concentration</th>
<th>Occ. Alarm Pressure (CC)</th>
<th>Soft Alert Min</th>
<th>Soft Alert Max</th>
<th>Continuous Dose Rate</th>
<th>Default</th>
<th>Mode</th>
<th>Dose Soft Alert Min</th>
<th>Dose Soft Alert Max</th>
<th>Dose Hard Limit Max</th>
<th>Dose Default</th>
<th>Rate Default</th>
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<tbody>
<tr>
<td>ADREnaline 60mcg/ml</td>
<td>60 60</td>
<td>25 mmHg</td>
<td>0.2 µg/kg/min</td>
<td>1 µg/kg/min</td>
<td>1.5 µg/kg/min</td>
<td>0.2 µg/kg/min</td>
<td>Disabled</td>
<td>---</td>
<td>---</td>
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<td>1200 µg/20 ml (60 µg/ml)</td>
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</tr>
<tr>
<td>ADREnaline200mcg/ml</td>
<td>200 200</td>
<td>25 mmHg</td>
<td>1 µg/kg/min</td>
<td>2 µg/kg/min</td>
<td>3 µg/kg/min</td>
<td>1 µg/kg/min</td>
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<td>4000 µg/20 ml (200 µg/ml)</td>
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<tr>
<td>ALprostad 1000ng/ml</td>
<td>1 1</td>
<td>25 mmHg</td>
<td>5 ng/kg/min</td>
<td>20 ng/kg/min</td>
<td>50 ng/kg/min</td>
<td>10 ng/kg/min</td>
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<td>ALprostad 4000ng/ml</td>
<td>4 4</td>
<td>25 mmHg</td>
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<tr>
<td>AminoPHYline 1mg/ml</td>
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<td>25 mmHg</td>
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</tr>
<tr>
<td>ATRacurium 1mg/ml</td>
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<td>25 mmHg</td>
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<td>25 mmHg</td>
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<td>Clonaz 100mcg/ml</td>
<td>1.2 1.2</td>
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<td>10 µg/kg/min</td>
<td>5 µg/kg/min</td>
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</tr>
<tr>
<td>DoBUTam 1200mcg/ml</td>
<td>2.4 2.4</td>
<td>25 mmHg</td>
<td>5 µg/kg/min</td>
<td>20 µg/kg/min</td>
<td>30 µg/kg/min</td>
<td>10 µg/kg/min</td>
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<tr>
<td>60 mg/50 ml (1.2 mg/ml)</td>
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<tr>
<td>DoBUTam 2400mcg/ml</td>
<td>2.4 2.4</td>
<td>25 mmHg</td>
<td>5 µg/kg/min</td>
<td>20 µg/kg/min</td>
<td>30 µg/kg/min</td>
<td>10 µg/kg/min</td>
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<tr>
<td>DOPamine 1200mcg/ml</td>
<td>2.4 2.4</td>
<td>25 mmHg</td>
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<td>20 µg/kg/min</td>
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<td>DOPamine 2400mcg/ml</td>
<td>2.4 2.4</td>
<td>25 mmHg</td>
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<td>FENtanyl 2.5mcg/ml</td>
<td>2.5 2.5</td>
<td>25 mmHg</td>
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<td>3 µg/kg/h</td>
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<tr>
<td>20 µg/8 ml (2.5 µg/ml)</td>
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</tr>
<tr>
<td>FLEcainide200mcg/ml</td>
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<td>25 mmHg</td>
<td>100 µg/kg/h</td>
<td>250 µg/kg/h</td>
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<td>100 µg/kg/h</td>
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<tr>
<td>10 mg/50 ml (0.2 mg/ml)</td>
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<td>Glucose 10%</td>
<td>1 1</td>
<td>25 mmHg</td>
<td>0.1 ml/h</td>
<td>5 ml/h</td>
<td>6 ml/h</td>
<td>0.1 ml/h</td>
<td>Hands On and Hands Free</td>
<td>0.1 ml</td>
<td>2 ml</td>
<td>2.5 ml</td>
<td>0.5 ml</td>
<td>10 ml/h</td>
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<tr>
<td>Drug Name</td>
<td>Concentration</td>
<td>Occ. Alarm Pressure (CC)</td>
<td>Continuous Dose Rate</td>
<td>Bolus</td>
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<td>Max</td>
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<td>Soft Alert Max</td>
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### Profile: > 2.5 Kg

**Drug Library - > 2.5 Kg**

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<th>Continuous Dose Rate</th>
<th>Bolus</th>
<th>Dose Soft Alert</th>
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## Configuration Parameters - > 2.5 Kg

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## Drug Library - 1 - 2.5 Kg

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<th>Dose Rate</th>
<th>Hard Limit</th>
<th>Default</th>
<th>Bolus Mode</th>
<th>Dose Soft Alert</th>
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<th>Dose Hard Limit</th>
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<td>Potas Chlor 15mg/ml 150 mg/10 ml (15 mg/ml)</td>
<td>15 15</td>
<td>25 mmHg</td>
<td>4.5 mg/kg/h 15 mg/kg/h 22.5 mg/kg/h 7.5 mg/kg/h</td>
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## Configuration Parameters - 1 - 2.5 Kg

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