DRUG: ADRENALINE

USE: Acute hypotension

DOSE: Via a CENTRAL venous line

Initially 100-300 nanograms/kg/minute
0.1-0.3 microgram/kg/minute adjusted
according to response up to a maximum of 1.5
micrograms/kg/minute. Increase dose
gradually. To withdraw gradually reduce dose
over 12-24 hours.

PREPARATIONS:
Adrenaline 1mg in 1ml (1:1000)
Adrenaline 100micrograms in 1ml (1:10,000)

DILUTION:
Make up the infusion using 1:1000 (1mg/ml)
Protect infusion from light. Do not use if
solution is brown in colour.

Standard Strength:
Weight in Kg x 3 = mg of adrenaline made up
to 50ml with chosen diluents eg 10% dextrose
0.1ml /hour = 100nanogram/kg/minute
(0.1 microgram/kg/minute)

Double strength:
Weight in kg x 6 = mg adrenaline made up to
50 mls with chosen diluent. Rate 0.1ml/hr =
200nanograms/kg/min (0.2microgram/kg/min)

Quadruple Strength:
Weight in kg x 12 = mg adrenaline made up to
50 mls with chosen diluent. Rate 0.1mls/hr
=400 nanograms/kg/min (0.4
micrograms/kg/min)

DILUENTS:
Dextrose 5%,Dextrose 10%, Sodium Chloride
0.9%

KNOWN COMPATIBILITY:
Calcium salts, Dopamine, Dobutamine, Fentanyl,
Frusemide, Heparin, Midazolam,
Morphine, Noradrenaline,
Pancuronium, Potassium Chloride, Ranitidine,
TPN, Vecuronium

KNOWN INCOMPATIBILITIES:
Lipid, Sodium bicarbonate and alkaline solutions

Adverse Effects
Hypertension, cardiac arrhythmias
Renal vascular ischemia with doses more than
2microgram/kg/min. Extravasation can cause
tissue necrosis
**DRUG:** Sodium Bicarbonate

**USE:** To prevent metabolic acidosis in very premature babies with large renal bicarbonate losses

**Route** Via a Umbilical arterial/ peripheral arterial line

<table>
<thead>
<tr>
<th>PREPARATIONS:</th>
<th>3mls of 4.2% sodium bicarbonate + 16 ml of water for infusion + 1 ml of Heparin (10 units/ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total volume of infusion =20 ml</td>
</tr>
<tr>
<td></td>
<td>Final concentration of heparin in the infusion is 0.5 units/ml</td>
</tr>
</tbody>
</table>

**Dose** 0.3 ml – 0.6ml /hour

**Special Precaution** Will need a separate 50 ml syringe (45ml of 0.45% saline + 5 ml of heparin 10 units/ml ) for flushing after sampling.
DRUG: Calcium Gluconate

USE: Correct Hypocalcaemia
Normal range 2.1 - 2.7 mmol/L

DOSE: 

Emergency Correction
Give 0.5 to 2 mls/kg calcium gluconate 10% undiluted intravenously over 5-10 mins (ecg monitoring)

Maintenance
0.5 - 1.5 mmol/kg/day calcium by IV infusion over 24 hours
= 
2.2ml-6.8ml/kg/24hours of Calcium gluconate 10%

PREPARATIONS: Calcium Gluconate 10% ; 10 ml ampoules

0.22mmol calcium in 1ml = 8.4 mg Calcium/ml

DILUTION: For continuous infusion - dilute dose required 5-10 fold.
Final concentration should not be more than 0.045mmol/ml

DILUENTS: Dextrose 5%, Dextrose 10%, Sodium Chloride 0.9% or 0.45%

KNOWN COMPATIBILITY: Adrenaline, Heparin, Furosemide, Hydrocortisone, Magnesium sulphate, Midazolam, Potassium Chloride, Vancomycin

KNOWN INCOMPATIBILITIES: Amphotericin, Dobutamine, Fluconazole, Indomethacin, Phosphates, Sodium Bicarbonate, hydrocortisone

Adverse Effects Tissue necrosis on extravasation, bradycardia.
Do not use small veins.
DRUG: Clonazepam

USE: Anticonvulsant for Refractory seizures. Use only if no safer alternative. Intravenous infusion potentially hazardous (especially if prolonged)

DOSE: 
- **IV Bolus**
  - Neonate: 100microgram/kg/day over at least 2 min. Repeat after 24 hours if necessary
  - > 1 month: 50 microgram/kg over at least 2 min, repeated if necessary

- **IV Infusion**
  - Initially 50microgram/kg THEN
  - 10microgram/kg/hour adjusted according to response
  - (Max 60microgram/kg/hour)

PREPARATIONS: Clonazepam 1mg in 1ml supplied with a further 1ml ampoule water for injection. Mix immediately before use to give 1mg/2ml

DILUTION: Add 1 ml of diluent to clonazepam ampoule and then make up to 10 mls with 5% dextrose or 0.9% sodium chloride to give 100 micrograms per ml

- **IV Infusion**
  - (Weight in grams x0.5)=micrograms of clonazepam made up to 50ml with dextrose 5%
  - 1ml/hr=10micrograms/kg/hour
  - Administer in NON PVC containers
  - Expiry 12 hours after dilution

DILUENTS: Dextrose 5% . Sodium Chloride 0.9%

KNOWN INCOMPATIBILITIES: Do not mix with any other drug or infusion

Adverse Effects: Respiratory depression, salivary and bronchial hypersecretions
- Reduce dose in renal impairment
- Avoid in liver impairment as can precipitate coma
**DRUG:** Dobutamine

**USE:** Inotrope; It is a β agonist which improves myocardial contractility and increases cardiac output. At high doses its β2 effects can decrease rather than increase systemic vascular resistance.

**DOSE:** 2-20 micrograms/kg/minute by continuous infusion; generally start with 5 microgram/kg/min.

**PREPARATIONS:** Dobutamine 250mg in 20ml (12.5mg in 1ml) NB other strengths are available

**DILUTION:**
- **SINGLE STRENGTH**
  - (Weight in Kg x 30) = mg dobutamine made up to 50ml with diluent
  - 0.2-2ml/hour = 2-20 microgram/kg/minute
- **DOUBLE STRENGTH**
  - (Weight in Kg x 60) = mg dobutamine made up to 50ml with diluent
  - 0.1-1ml/hour = 2-20 microgram/kg/minute
- **QUADRUPLE STRENGTH**
  - (Weight in Kg x 120) = mg dobutamine made up to 50ml with diluent
  - 0.1-0.5ml/hour = 4-20 microgram/kg/minute
  - Discard solution if a brown colour develops

**DILUENTS:** Dextrose 5%, Dextrose 10%, Sodium Chloride 0.9%

**KNOWN COMPATIBILITIES**
- Adrenaline, amiodarone, dopamine, fentanyl, lignocaine, morphine, noradrenaline, pancuronium, potassium, calcium gluconate, Ranitidine, magnesium sulphate, milrinone, TPN

**KNOWN INCOMPATIBILITIES:**
- Aciclovir, Amphotericin, Penicillin, frusemide, indomethacin, phenytoin, sodium bicarbonate, Tazocin, heparin

**SPECIAL PRECAUTIONS**
- Dose > 10 microgram/kg/min may produce peripheral vasoconstriction; give via central line.
- Correct hypovolemia first.
DRUG: Dopamine

USE: Inotrope

DOSE: 2-20 micrograms/kg/minute by continuous infusion; generally start with 5 microgram/kg/min.

PREPARATIONS: Dopamine 40mg/ml. NB other strengths are available

DILUTION: SINGLE STRENGTH
(Weight in Kg x 30) = mg dopamine made up to 50ml with diluent
0.1-2ml/hour = 1-20 microgram/kg/minute

DOUBLE STRENGTH
(Weight in Kg x 60) = mg dopamine made up to 50ml with diluent
0.1-1ml/hour = 2-20 microgram/kg/minute

QUADRUPLE STRENGTH
(Weight in Kg x 120) = mg dopamine made up to 50ml with diluent
0.1-0.5ml/hour = 4-20 microgram/kg/minute

Discard solution if a brown colour develops

DILUENTS: Dextrose 5%, Dextrose 10%, Sodium Chloride 0.9%

KNOWN COMPATIBILITIES: Amiodarone, dobutamine, fentanyl, heparin, midazolam, morphine, noradrenaline, pancuronium, potassium chloride, ranitidine, vecuronium, milrinone

KNOWN INCOMPATIBILITIES: Alkaline solutions, aciclovir, amphotericin, ampicillin, benzylpenicillin, indomethacin, insulin, metronidazole, sodium bicarbonate, tolazoline, TPN

SPECIAL PRECAUTIONS: Dose > 10 microgram/kg/min may produce peripheral vasoconstriction; give via central line
**DRUG:** Midazolam

**USE:** Sedative, Anticonvulsant

**DOSE:**

For sedation
- Less than 32 weeks gestation
  - 30 micrograms/kg/hour continuous infusion
- More than 32 weeks gestation
  - 60 micrograms/kg/hour continuous infusion

For Anticonvulsant effect
- Initial dose of 150-200 microgram/kg over 2 minutes
- Followed by continuous infusion of
  - 60 microgram/kg/hour; increase by
  - 60 microgram/kg/hour every 15 minutes till seizure control
- Max dose 300 microgram/kg/hour

**PREPARATIONS:**
- 2ml ampoule containing 10mg/2ml. NB other strengths are available

**DILUTION:**
- 15 mg/kg midazolam diluted to 50ml with diluent
- Infuse at 0.1 ml/hour to give 30 microgram/kg/hour

**DILUENTS:** Dextrose 5%, Dextrose 10%, Sodium Chloride 0.9%

**KNOWN COMPATIBILITIES**
- Adrenaline, Calcium gluconate, Dopamine, Dobutamine, Fentanyl, Heparin, Morphine, Noradrenaline, Pancuronium, Potassium chloride, Vecuronium, Vancomycin, fentanyl, milrinone, ranitidine

**KNOWN INCOMPATIBILITIES:** Frusemide, Sodium bicarbonate.

**SPECIAL PRECAUTIONS**
- Monitor BP and respiratory status
- Flumazenil is the specific antidote
- Withdraw slowly after prolonged use
DRUG: Milrinone

USE: Improving cardiac output

DOSE: Loading dose 50 - 75 microgram/kg over 30-60 minutes (reduce/omit this dose if risk of hypotension)
Maintenance dose Continuous infusion of 30-45 microgram/kg/hour for 2-3 days
Reduce dose by 25 to 50 % in renal impairment

PREPARATIONS: Milrinone 1mg/ml; 10ml ampoules

DILUTION: 1.5 mg/kg of Milrinone; dilute to 50 ml with diluents.
1ml/hour= 30microgram/kg/hour
(Concentrations of 400 microgram/ml have been used when fluid restriction is necessary)

DILUENTS: Dextrose 5%, Sodium chloride 0.45%
Sodium Chloride 0.9%

KNOWN COMPATIBILITIES: Adrenaline, Calcium gluconate, Magnesium sulphate, Dopamine, Dobutamine, Heparin, Fentanyl, Insulin, Morphine, Midazolam, Noradrenaline, pancuronium, veruronium

KNOWN INCOMPATIBILITIES: Furosemide, Intralipid

SPECIAL PRECAUTIONS: Ectopic beats, ventricular arrhythmias, hypotension, hypokalemia, thrombocytopenia, tremor, rarely bronchospasm
DRUG: Morphine

USE: Sedative and analgesic,

DOSE: Loading dose 50 microgram/kg as a slow bolus

Maintenance dose 5-25 microgram/kg/hour continuous infusion

PREPARATIONS: 1 ml ampoule containing 10mg/ml
1 ml ampoule containing 1mg/ml

DILUTION: Some units use a standard infusion premade in pharmacy containing 1 mg morphine made up to 20 mls with 5% dextrose: Or 500 micrograms morphine made up to 10 mls with 5% dextrose to make 50 micrograms morphine per ml.

The dose can then be titrated according to the weight of the baby using the table on the next page.

DILUENTS: Dextrose 5%, Dextrose 10%, Sodium chloride 0.45%, Sodium chloride 0.9%

KNOWN COMPATIBILITIES: Adrenaline, cefotaxime, Dopamine, Dobutamine, Gentamicin, Hydrocortisone, Insulin, Meropenem, Midazolam Noradrenaline, Pancuronium, Vecuronium, Vancomycin, Metronidazole, Milrinone, TPN

KNOWN INCOMPATIBILITIES: Frusemide, Amphotericin

SPECIAL PRECAUTIONS: Monitor BP and respiratory status, constipation. Naloxone is the antidote
Morphine Syringes – 50 micrograms per 1ml Dextrose 5%

<table>
<thead>
<tr>
<th>Baby’s Weight</th>
<th>5 mcg/kg/hr</th>
<th>10 mcg/kg/hr</th>
<th>20 mcg/kg/hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5 kg</td>
<td>-</td>
<td>0.1ml/hr</td>
<td>0.2ml/hr</td>
</tr>
<tr>
<td>0.75 kg</td>
<td>0.1 ml/hr</td>
<td>0.15ml/hr</td>
<td>0.3ml/hr</td>
</tr>
<tr>
<td>1.0 kg</td>
<td>0.1ml/hr</td>
<td>0.2ml/hr</td>
<td>0.4ml/hr</td>
</tr>
<tr>
<td>1.25 kg</td>
<td>0.12 ml/hr</td>
<td>0.25ml/hr</td>
<td>0.5ml/hr</td>
</tr>
<tr>
<td>1.5 kg</td>
<td>0.15 ml/hr</td>
<td>0.3ml/hr</td>
<td>0.6ml/hr</td>
</tr>
<tr>
<td>1.75 kg</td>
<td>0.17ml/hr</td>
<td>0.35ml/hr</td>
<td>0.7ml/hr</td>
</tr>
<tr>
<td>2.0 kg</td>
<td>0.2ml/hr</td>
<td>0.4ml/hr</td>
<td>0.8ml/hr</td>
</tr>
<tr>
<td>2.25 kg</td>
<td>0.22ml/hr</td>
<td>0.45ml/hr</td>
<td>0.9ml/hr</td>
</tr>
<tr>
<td>2.5 kg</td>
<td>0.25ml/hr</td>
<td>0.5ml/hr</td>
<td>1.0ml/hr</td>
</tr>
<tr>
<td>2.75 kg</td>
<td>0.27ml/hr</td>
<td>0.55ml/hr</td>
<td>1.1ml/hr</td>
</tr>
<tr>
<td>3.0 kg</td>
<td>0.3ml/hr</td>
<td>0.6ml/hr</td>
<td>1.2ml/hr</td>
</tr>
<tr>
<td>3.25 kg</td>
<td>0.32ml/hr</td>
<td>0.65ml/hr</td>
<td>1.3ml/hr</td>
</tr>
<tr>
<td>3.5 kg</td>
<td>0.35ml/hr</td>
<td>0.7ml/hr</td>
<td>1.4ml/hr</td>
</tr>
<tr>
<td>3.75 kg</td>
<td>0.37ml/hr</td>
<td>0.75ml/hr</td>
<td>1.5ml/hr</td>
</tr>
<tr>
<td>4.0 kg</td>
<td>0.4ml/hr</td>
<td>0.8ml/hr</td>
<td>1.6ml/hr</td>
</tr>
</tbody>
</table>
DRUG: Noradrenaline

USE: Inotrope

VIA CENTRAL LINE ONLY

DOSE: 20-100 nanograms/kg/min Noradrenaline base adjusted according to response.
     Max 1 microgram/kg/minute (1000 nanogram/kg/min)

PREPARATIONS: Noradrenaline acid tartrate 2mg in 1ml equivalent to Noradrenaline BASE 1mg in 1ml

DILUTION: Weight in kg x 3 = mg noradrenaline base made up to 50ml with diluent
     0.1ml/hour=100nanogram/kg/minute
     Protect infusion from light
     Discard solution if brown colour develops

DILUENTS: Dextrose 5%, Dextrose 10%, Sodium chloride 0.9%

KNOWN COMPATIBILITIES Adrenaline, calcium gluconate, dobutamine dopamine, fentanyl, heparin, magnesium sulphate, midazolam, morphine, potassium chloride, Frusemide, meropenem, milrinone, vecuronium

KNOWN INCOMPATIBILITIES: Insulin, lignocaine, sodium bicarbonate.

SPECIAL PRECAUTIONS Monitor limb perfusion, urine output. Should be used in conjunction with Dopamine to sustain renal blood flow
     Decrease dose gradually over 12 -24 hours.
**DRUG:** Prostaglandin E2 (DINOPROSTONE)

**USE:** Maintain patency of duct

**DOSE:** 5-20 nanograms/kg/minute

Usual dose 10 nanograms/kg/minute up to a maximum of 40 nanogram/kg/minute

**PREPARATIONS:** 0.75ml ampoule of Prostaglandin E2 containing 1mg in 1ml

**DILUTION:** Add 0.5ml (500 microgram) to 500ml of 10% glucose to give a solution of 1 microgram in 1ml. Take 50 mls of this solution into a syringe for infusion. Infuse at 0.6ml/kg/hour =10 nanogram/kg/min.

**DILUENTS:** Dextrose 5%, Dextrose 10%, 0.9% saline

**KNOWN INCOMPATIBILITIES:** Very unstable, DO NOT infuse with any other drug.

**SPECIAL PRECAUTIONS** Watch for apnoea, bradycardia, transient pyrexia, seizures, hypotension. DO NOT stop the infusion.
DRUG: Vecuronium

USE: Muscle paralysis during assisted ventilation

DOSE: IV bolus Injection:
Initially 80-100 microgram/kg then

Either a) Doses of 30-50 microgram/kg repeated according to response
Usually every 2-4 hours

Or b) Continuous IV Infusion:
50-80 microgram/kg/hour adjusted according to response

PREPARATIONS: Vial of Vecuronium 10 mg with 5 ml water for reconstitution

DILUTION: IV Injection – Reconstitute 10 mg vial with 5 ml water for injection to give a solution containing 2 mg/ml
Dilute 1 ml of this solution with 1 ml of diluent, to give a final concentration of 100 microgram in 0.1 ml

IV Infusion – Reconstitute 10 mg vial with 5 mls water for injections to give a solution containing 2 mg vecuronium per ml. Then follow instructions below for single/double/quadruple strength solutions

Single strength solution:
(Weight in Kg × 5) mg of vecuronium made up to 50 ml with diluent
0.5 ml - 1 ml/hr = 50-100 micrograms/kg/hr

Double strength solution:
(Weight in Kg × 10) mg of vecuronium made up to 50 ml with diluent
0.25 - 0.5 mls/hr = 50-100 micrograms/Kg/hr

Quadruple strength solution:
(Weight in Kg × 20) mg of vecuronium made up to 50 ml with diluent
0.125 - 0.25 mls/hr = 50-100 micrograms/Kg/hr.

DILUENTS: Dextrose 5%, 0.9% saline

KNOWN COMPATIBILITIES Adrenaline, Dobutamine, Dopamine, Morphine,
Fentanyl, Midazolam, Noradrenaline, Gentamicin, Heparin, Vancomycin, Milrinone

KNOWN INCOMPATIBILITIES:
Furosemide, Sodium bicarbonate, Amphotericin

SPECIAL PRECAUTIONS
Flushing, erythema, hypotension, bronchospasm
Prolonged effect seen in renal failure, may need a dose reduction
Enhanced effect with aminoglycosides, diuretics.