

# Southampton PICU Intravenous Drug Infusion Guide 2018 (SORT)

## Please read the following points before using the guide:

- ▶ Renew infusions every 24 hours unless otherwise stated.
- ▶ To avoid unnecessary waste, aim to prescribe/prepare infusion quantities to last for a 24-hour period.
- ▶ Remember – not all infusions are prescribed in 50ml.
- ▶ Infusion concentrations may need to be adapted according to the patients' fluid requirements, particularly in neonates.
- ▶ Dose ranges are included as a guide only and may not apply in all situations. Neonatal dose ranges may be lower for some drugs.
- ▶ Many of the drugs are either completely unlicensed in children, or by the method described. Responsibility for “off-label” prescribing lies with the prescriber.
- ▶ This guide is intended for use on the Paediatric Intensive Care Unit, Southampton Children’s Hospital or in conjunction with the Southampton Oxford Retrieval team.
- ▶ It is the responsibility of the individual using the guide to ensure the information applies to their clinical situation.
- ▶ **CAUTION:** Certain drugs or dose ranges are unsuitable for use outside an Intensive Care Unit, or without adequate monitoring, resuscitation and ventilation facilities.
- ▶ Only use following discussion with SORT consultant.

## Calculation examples

### A. Weight based mg/kg dilution

e.g. Dopamine for a 10kg child  
Use 15mg/kg in 50ml  
i.e.  $15 \times 10 = 150\text{mg}$  in 50ml  
 $1\text{ml/hr} = 5 \text{ micrograms/kg/min}$   
 $0.4 - 2\text{ml/hr} = 2 - 10 \text{ micrograms/kg/min}$

*With this method you are adjusting the concentration of the infusion for the child's weight.*

### B. “Fixed” concentration

e.g. Dopamine for a 30kg child  
Use 200mg in 50ml  
 $1\text{ml/hr} = (66.7 \div \text{wt}) \text{ micrograms/kg/min}$   
 $1\text{ml/hr} = 2.2 \text{ micrograms/kg/min}$   
 $0.03-0.15\text{ml/kg/hr} = 2-10 \text{ micrograms/kg/min}$   
 $0.9 - 4.5 \text{ ml/hr} = 2 - 10 \text{ micrograms/kg/min}$

*With this method the infusion concentration remains the same, and you are adjusting the volume administered according to weight.*

Drug and route	Prescription and administration guideline (NS=sodium chloride 0.9%; G=glucose 5% or 10%)	
<b>Adrenaline (peripheral)</b> <b>Short-term use only</b> Central access required for continuing infusions	<b>Under 13kg:</b> mg/kg dilution 0.03mg/kg in 50ml (NS or G) 1ml/hr = 0.01micrograms/kg/min Usual dose range: 5-50ml/hr = 0.05 -0.5micrograms/kg/min	<b>Over 13kg:</b> Fixed concentration (8micrograms/ml) 0.4mg in 50ml (NS or G) (or 4mg in 500ml) 1ml/hr = (0.13 ÷ wt) micrograms/kg/min Usual dose range: 0.375-3.75ml/kg/hr = 0.05 -0.5micrograms/kg/min
<b>Adrenaline (central)</b>  Ampoules available: 1mg in 1ml (1:1000) 1mg in 10ml (1:10,000)	<b>Under 13kg:</b> mg/kg dilution 0.3mg/kg in 50ml (NS or G) 1ml/hr = 0.1micrograms/kg/min Usual dose range: 0.5-5ml/hr = 0.05-0.5micrograms/kg/min	<b>Over 13kg:</b> Fixed concentration (80micrograms/ml) 4mg in 50ml (NS or G) 1ml/hr = (1.3 ÷ wt) micrograms/kg/min Usual dose range: 0.0375-0.375ml/kg/hr = 0.05-0.5micrograms/kg/min
<b>Aminophylline (central or peripheral)</b>  Ampoules available: 250mg in 10ml	<b>Under 20kg:</b> Fixed concentration (1mg/ml) 250mg in 250ml (NS or G) 1ml/hr = (1 ÷ wt) mg/kg/hr Usual dose range 0.5-1ml/kg/hr = 0.5-1mg/kg/hr Following loading dose, maintenance dose depends on age (see BNF-C). Not usually used in neonates	<b>Over 20kg:</b> Fixed concentration (1mg/ml) 500mg in 500ml (NS or G) 1ml/hr = (1 ÷ wt) mg/kg/hr Usual dose range 0.5-1ml/kg/hr = 0.5-1mg/kg/hr Following loading dose, initial maintenance dose depends on age (see BNF-C).
<b>Amiodarone (peripheral)</b> <b>Short-term use only</b> Central access required for continuing infusions	<b>All ages:</b> Fixed concentration (1.5mg/ml) 75mg in 50ml glucose 5% (or 750mg in 500ml glucose 5%) 1ml/hr = (25 ÷ wt) micrograms/kg/min Usual dose range: 0.2-0.8ml/kg/hr = 5-20micrograms/kg/min. Loading dose may be required.	
<b>Amiodarone (central)</b>  Ampoules available: 150mg in 3ml	<b>All ages:</b> Fixed concentration (3mg/ml) 150mg in 50ml glucose 5% 1ml/hr = (50 ÷ wt) micrograms/kg/min Usual dose range: 0.1-0.4ml/kg/hr = 5-20micrograms/kg/min. Loading dose may be required.	
<b>Calcium gluconate 10%</b>  Ampoules available: 1g in 10ml (0.225mmol per ml)	<b>All ages:</b> Fixed concentration (0.225mmol/ml) 4.5mmol in 20ml 1ml/hr = (0.225 ÷ wt) mmol/kg/hr Usual dose range: 0.1-0.2ml/kg/hr = 0.5-1mmol/kg/day	

<p><b>Dinoprostone (central or peripheral)</b></p> <p>Ampoules available: 0.75mg in 0.75ml</p> <p>Please note: 1mg = 1000micrograms 1 microgram = 1000 nanograms</p>	<p><b>Neonates only:</b> Fixed concentration (1microgram/ml)</p> <p>50micrograms in 50ml glucose 5% or 10%</p> <p>1ml/hr = (16.7 ÷ wt) nanograms/kg/min</p> <p>Usual dose range: 0.3-3ml/kg/hr = 5-50 nanograms/kg/min</p> <p><i>CAUTION : 750 micrograms in ampoule – prepare infusion in 2 stages:</i></p> <ol style="list-style-type: none"> <li>1) Take 0.5ml (500micrograms) of concentrated solution from the ampoule and dilute to 10ml to make a 50microgram/ml solution;</li> <li>2) Take 1ml of this 50microgram/ml solution and dilute to 50ml to make a 1microgram/ml solution.</li> </ol>	
<p><b>Dopamine (peripheral)</b></p> <p><b>Short-term use only</b></p> <p>Central access required for continuing infusions</p>	<p><b>Under 13kg:</b> mg/kg dilution</p> <p>1.5mg/kg in 50ml (NS or G)</p> <p>1ml/hr = 0.5micrograms/kg/min</p> <p>Usual dose range: 4-20ml/hr = 2-10 micrograms/kg/min</p>	<p><b>Over 13kg:</b> Fixed concentration (0.4mg/ml)</p> <p>20mg in 50ml (NS or G)</p> <p>1ml/hr = (6.7 ÷ wt) micrograms/kg/min</p> <p>Usual dose range: 0.3-1.5ml/kg/hr = 2-10 micrograms/kg/min</p>
<p><b>Dopamine (central)</b></p> <p>Ampoules available: 200mg in 5ml</p>	<p><b>Under 13kg:</b> mg/kg dilution</p> <p>15mg/kg in 50ml (NS or G)</p> <p>1ml/hr = 5micrograms/kg/min</p> <p>Usual dose range: 0.4-2ml/hr = 2-10 micrograms/kg/min</p>	<p><b>Over 13kg:</b> Fixed concentration (4mg/ml)</p> <p>200mg in 50ml (NS or G)</p> <p>1ml/hr = (66.7 ÷ wt) micrograms/kg/min</p> <p>Usual dose range: 0.03-0.15ml/kg/hr = 2-10 micrograms/kg/min</p>
<p><b>Fentanyl (peripheral or central)</b></p> <p>Ampoules available: 100micrograms in 2ml 500micrograms in 10ml</p>	<p><b>Under 10kg:</b> Fixed concentration (20 microgram/ml)</p> <p>1000micrograms in 50ml</p> <p>1ml/hr = (20 ÷ wt) micrograms/kg/hr</p> <p>Usual dose range: 1-6micrograms/kg/hr</p>	<p><b>Over 10kg:</b> Fixed concentration (50 microgram/ml)</p> <p>1000micrograms in 20ml (or 2500micrograms in 50ml depending on rate of infusion)</p> <p>1ml/hr = (50 ÷ wt) micrograms/kg/hr</p> <p>Usual dose range: 1-6micrograms/kg/hr</p>

<b>Isoprenaline</b> (central or peripheral)  Ampoules available:	<b>Under 6kg:</b> mg/kg dilution 0.3mg/kg in 50ml (NS or G) 1ml/hr = 0.1microgram/kg/min  Usual dose range: 0.2-5ml/hr = 0.02-0.5micrograms/kg/min (bradycardia); 1-10ml/hr = 0.1-1mcg/kg/min (CHB)	<b>Over 6kg:</b> Fixed conc (40micrograms/ml)  2mg in 50ml (NS or G) 1ml/hr= (0.67+ wt) micrograms/kg/min  Usual dose range: 0.03-0.75ml/kg/hr = 0.02-0.5micrograms/kg/min (bradycardia); 0.15-1.5ml/kg/hr = 0.1-1mcg/kg/min (CHB)
<b>Midazolam</b> (central or peripheral)  Ampoules available: 10mg in 2ml and 10mg in 5ml	<b>Under 3kg:</b> mg/kg dilution 2mg/kg in 50ml (NS or G) 1ml/hr = 40micrograms/kg/hr  Usual dose range: 0.2-1.5ml/hr =10-60micrograms/kg/hr	<b>Over 3kg:</b> mg/kg dilution 1mg/kg in 50ml (NS or G) 1ml/hr = 20micrograms/kg/hr  Usual dose range: 0.5-5ml/hr =10-100micrograms/kg/hr
<b>Milrinone</b> (central or peripheral)  Ampoules available: 10mg in 10ml	<b>All ages:</b> Fixed concentration (200mcg/ml)  10mg in 50ml (NS or G) 1ml/hr= (3.3 + wt) micrograms/kg/min  Usual dose range: 0.11-0.23ml/kg/hr = 0.375-0.75micrograms/kg/min	
<b>Morphine</b> (central or peripheral)  Ampoules available: 10mg in 1ml and 30mg in 1ml	<b>Under 3kg:</b> mg/kg dilution 2mg/kg in 50ml (NS or G) 1ml/hr = 40micrograms/kg/hr  Usual dose range: 0.2-1ml/hr =10-40micrograms/kg/hr	<b>Over 3kg:</b> mg/kg dilution 1mg/kg in 50ml (NS or G) 1ml/hr = 20micrograms/kg/hr  Usual dose range: 0.5-4ml/hr =10-80micrograms/kg/hr
<b>Noradrenaline</b> (central)  Ampoules available:4mg in 4ml	<b>Under 13kg:</b> mg/kg dilution 0.3mg/kg in 50ml (NS or G) 1ml/hr = 0.1micrograms/kg/min  Usual dose range: 0.5-5ml/hr = 0.05 -0.5micrograms/kg/min	<b>Over 13kg:</b> Fixed concentration (80micrograms/ml)  4mg in 50ml (NS or G) 1ml/hr= (1.3 + wt) micrograms/kg/min  Usual dose range: 0.0375-0.375ml/kg/hr = 0.05 -0.5micrograms/kg/min
<b>Phenylephrine</b> (central or peripheral) <b>Short-term use only</b> Central access required for continuing infusions Ampoules:10mg in 1ml and 1mg in 10ml	<b>Fixed concentration</b> (100mcg/ml)  10mg in 100ml (NS or G) 1ml/hr= (1.67 + wt) micrograms/kg/min  Usual dose range: 0.06-0.3ml/kg/hr = 0.1-0.5mcg/kg/min	
<b>Propofol</b> (central or peripheral)  Amp/vial available: 200mg in 20ml and 500mg in 50ml	<b>Fixed concentration</b> (10mg/ml)  500mg in 50ml (NS or G) 1ml/hr= (10 + wt) mg/kg/hr  Usual dose range: 0.1-0.4ml/kg/hr = 1-4mg/kg/hr	
<b>Salbutamol</b> (central or peripheral) Ampoules available: 0.5mg in 1ml 5mg in 5ml	<b>Fixed concentration</b> (0.2mg/ml)  10mg in 50ml (NS or G) 1ml/hr= (3.3 + wt) micrograms/kg/min  Usual dose range: 0.15-0.6ml/kg/hr = 0.5-2micrograms/kg/min . Loading dose may be required	
<b>Vasopressin</b> (argipressin) <b>(central)</b>  Ampoules available: 20units in 1ml	<b>Under 20kg:</b> units/kg dilution 1unit/kg in 50ml (NS or G) 1ml/hr = 0.02units/kg/hr  Usual dose range: 0.5-6ml/hr = 0.01-0.12units/kg/hr	<b>Over 20kg:</b> Fixed concentration (1unit/ml)  20units in 20ml (NS or G) 1ml/hr= (1 + wt) units/kg/hr  Usual dose range: 0.01-0.12ml/kg/hr = 0.01-0.12units/kg/hr

