Southampton PICU Drug Infusion Guide 2018 (clonidine and heparin updated 2023)

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 General Hospital only.
- 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.

Post-op cardiac patients should initially be continued at theatre concentrations in PICU.
If infusion rates are so high that there is concern over volume overload, then infusions may be changed to stronger concentrations after discussion with the PICU consultant.

Calculation examples

A. Weight based mg/kg dilution

e.g. Dopamine for a 10kg child
Use 15mg/kg in 50ml,
i.e. 15 x 10 = 150mg in 50ml.
so, 1ml/hr = 5micrograms/kg/min.

With this method you are adjusting the concentration of the infusion for the childs weight.

B. "Fixed" concentration

e.g. Esmolol for a 10kg child
Always use 500mg in 50ml (= 10mg/ml)
so, 0.3ml/kg/hr = 50micrograms/kg/min
i.e. 3ml/hr = 50micrograms/kg/min for a 10kg child.

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

Drug & ampoule sizes	**Use**	**Prescription and administration guide** (NS=sodium chloride 0.9%, G=glucose 5% or 10%)	
Acetylcysteine 2g in 10ml	**PICU (peripheral or central)** Paracetamol overdose	**Under 40kg:** **1st infusion:** Prepare a 50mg/ml solution by diluting 2g acetylcysteine to 40ml with glucose 5% (or NS). Dose to give is 150mg/kg = 3ml/kg over 1 hr (at 3ml/kg/hr) **2nd infusion:** Prepare a 6.25mg/ml solution: first remove 190ml from a 500ml bag of glucose 5% (or NS), then add 2g acetylcysteine to this bag to give a total volume of 320ml. Dose to give is 50mg/kg acetylcysteine= 8ml/kg over 4 hr (at 2ml/kg/hr) **3rd infusion:** Use a 6.25mg/ml solution (prepared as above). Dose to give is 100mg/kg = 16ml/kg over 16hr (at 1ml/kg/hr) Doses may be dose-banded as Toxbase table	**Over 40kg:** **1st infusion:** 150mg/kg added to 200ml glucose 5% over 1hr **2nd infusion:** 50mg/kg added to 500ml glucose 5% over 4hrs **3rd infusion:** 50mg/kg added to 500ml glucose 5% over 8hrs **4th infusion:** 50mg/kg added to 500ml glucose 5% over 8hrs Doses may be dose-banded as Toxbase table
	PICU (peripheral or central) Antioxidant/acute liver failure	**Under 10kg:** Fixed concentration (20mg/ml) 1g in 50ml glucose 5% 1ml/hr = (20÷ wt) mg/kg/hr Usual dose range: 0.2-0.4ml/kg/hr = 4-8mg/kg/hr	**Over 10kg:** Fixed concentration (20mg/ml) 10g in 500ml glucose 5% 1ml/hr = (20÷ wt) mg/kg/hr Usual dose range: 0.2-0.4ml/kg/hr = 4-8mg/kg/hr
Adrenaline 1mg in 1ml (1:1000) 1mg in 10ml (1:10,000)	**PICU/SORT (central)**	**Under 13kg:** mg/kg dilution 0.3mg/kg in 50ml (G or NS) 1ml/hr = 0.1micrograms/kg/min Usual dose range: 0.5-5ml/hr = 0.05-0.5micrograms/kg/min	**Over 13kg**: 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
	Post-op cardiac (central)	**Under 13kg:** mg/kg dilution 0.15mg/kg in 50ml (G or NS) (consider using 1mg in 50ml if over 6kg) 1ml/hr = 0.05micrograms/kg/min Usual dose range: 1-10ml/hr = 0.05-0.5micrograms/kg/min	**Over 13kg:** Fixed concentration (20micrograms/ml) 1mg in 50ml (NS or G) 1ml/hr = (0.3 ÷ wt) micrograms/kg/min Usual dose range: 0.15-1.5ml/kg/hr = 0.05-0.5micrograms/kg/min
	PICU/SORT (peripheral) short-term use only Central access required for continuing infusions	**Under 13kg:** mg/kg dilution 0.03mg/kg in 50ml (G or NS) 1ml/hr = 0.01micrograms/kg/min Usual dose range: 5-50ml/hr = 0.05 -0.5micrograms/kg/min	**Over 13kg:** 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

Drug & ampoule sizes	**Use**	**Prescription and administration guide** (NS=sodium chloride 0.9%, G=glucose 5% or 10%)	
Alprostadil (only use if dinoprostone not available) 500microgams in 1ml Please note: 1mg = 1000micrograms 1 microgram = 1000 nanograms	**PICU/SORT/post-op cardiac (central or peripheral)**	**Neonates only:** Fixed concentration (1microgram/ml) 50micrograms in 50ml glucose 5% or 10% 1ml/hr = (16.7 ÷ wt) nanograms/kg/min) Usual dose range: 0.3-3ml/kg/hr = 5-50 nanograms/kg/min *NB. 500micrograms in ampoule – prepare infusion in 2 stages:* *1) Take 1ml of concentrated solution from the ampoule and dilute to 10ml to make a 50microgram/ml solution; then:-* *2) Take 1ml of this 50microgram/ml solution and dilute to 50ml to make a 1microgram/ml solution.*	
Aminophylline 250mg in 10ml	**PICU/SORT (central)**	**Under 20kg:** 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).	**Over 20kg:** 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).
Amiodarone 150mg in 3ml	**PICU/SORT/post-op cardiac (central)**	**All ages:** Fixed concentration (3mg/ml) 150mg in 50ml glucose 5% 1ml/hr = (50 ÷ wt) micrograms/kg/min Usual dose range: 0.1-0.5ml/kg/hr = 5-25micrograms/kg/min. Loading dose may be required.	
	PICU/SORT (peripheral) short-term use only Central access required for continuing infusions	**Under 20kg:** Fixed concentration (1.5mg/ml) 75mg in 50ml glucose 5% 1ml/hr = (25 ÷ wt) micrograms/kg/min Usual dose range: 0.2-1ml/kg/hr = 5-25micrograms/kg/min. Loading dose may be required.	**Over 20kg:** Fixed concentration (1.5mg/ml) 750mg in 500ml glucose 5% 1ml/hr = (25 ÷ wt) micrograms/kg/min Usual dose range: 0.2-1ml/kg/hr = 5-25micrograms/kg/min. Loading dose may be required.
L-Arginine 5g in 10ml (50%) 6g in 10ml (60%)	**PICU (central or peripheral)**	**All ages:** Fixed concentration (50mg/ml) 2g in 40ml glucose 5% or 10% 1ml/hr= (50 ÷ wt) mg/kg/hr Usual loading dose 150mg/kg over 90mins (2ml/kg/hr), followed by 0.25ml/kg/hr = 12.5mg/kg/hr = 300mg/kg/day)	
Calcium gluconate 10% 1g in 10ml (0.225mmol per ml)	**PICU/SORT/post-op cardiac (central)**	**Under 6kg:** Fixed concentration (0.225mmol/ml) 4.5mmol in 20ml or 9mmol in 40ml (undiluted) 1ml/hr = (0.225 ÷ wt) mmol/kg/hr Usual dose range: 0.1-0.2ml/kg/hr = 0.5-1mmol/kg/day	**Over 6kg:** Fixed concentration (0.225mmol/ml) 9mmol in 40ml (undiluted) 1ml/hr = (0.225 ÷ wt) mmol/kg/hr Usual dose range: 0.1-0.2ml/kg/hr = 0.5-1mmol/kg/day (usual max 9mmol/day)

Drug & ampoule sizes	**Use**	**Prescription and administration guide** (NS=sodium chloride 0.9%, G=glucose 5% or 10%)		
L-Carnitine 1g in 5ml ampoules	**PICU (central or peripheral)**	**All ages:** Fixed concentration (50mg/ml) 2g in 40ml glucose 5% or 10% 1ml/hr= (50 ÷ wt) mg/kg/hr Usual loading dose 100mg/kg over 30mins (4ml/kg/hr), followed by 0.08ml/kg/hr = 4mg/kg/hr = approx 100mg/kg/day)		
Clonidine (2023 new update) 150micrograms in 1ml	**PICU (central or peripheral)** **Sedation or withdrawal dose**	**Under 5kg:** Fixed concentration (7.5microg/ml) 375microg in 50ml (NS or G) 1ml/hr = (7.5 ÷ wt) micrograms/kg/hr Usual dose range: 0.033-0.27ml/kg/hr = 0.25-2microg/kg/hr	**5-20kg:** Fixed concentration (15microg/ml) 750microg in 50ml (NS or G) 1ml/hr = (15 ÷ wt) micrograms/kg/hr Usual dose range: 0.017-0.13ml/kg/hr = 0.25-2microg/kg/hr	**Over 20kg:** Fixed concentration (40microg/ml) 2000micrograms in 50ml (G or NS) 1ml/hr= (40 ÷ wt) micrograms/kg/hr Usual dose range: 0.006-0.05ml/kg/hr = 0.25-2 micrograms/kg/hr
	PICU (central or peripheral) **High dose for dystonia**	**All ages:** Fixed concentration (40micrograms/ml) 2000micrograms in 50ml (G or NS) 1ml/hr= (40 ÷ wt) micrograms/kg/hr Usual dose range: 0.05-0.225ml/kg/hr = 2-9 micrograms/kg/hr		
Dexmedetomidine 0.2mg in 2ml 0.4mg in 4ml 1mg in 10ml	**PICU (central or peripheral)**	**Under 20kg:** Fixed concentration (4micrograms/ml) 0.2mg in 50ml (NS or G) 1ml/hr= (4 ÷ wt) micrograms/kg/hr Usual dose range: 0.05-0.35ml/kg/hr = 0.2-1.4micrograms/kg/hr)	**Over 20kg:** Fixed concentration (8micrograms/ml) 0.4mg in 50ml (NS or G) 1ml/hr= (8 ÷ wt) micrograms/kg/hr Usual dose range: 0.025-0.175ml/kg/hr = 0.2-1.4micrograms/kg/hr)	
	PICU (central or peripheral) Fluid restricted	**Under 20kg:** Fixed concentration (8micrograms/ml) 0.4mg in 50ml (NS or G) 1ml/hr= (8 ÷ wt) micrograms/kg/hr Usual dose range: 0.025-0.175ml/kg/hr = 0.2-1.4micrograms/kg/hr)	**Over 20kg:** Fixed concentration (20micrograms/ml) 1mg in 50ml (NS or G) 1ml/hr= (20 ÷ wt) micrograms/kg/hr Usual dose range: 0.01-0.07ml/kg/hr = 0.2-1.4micrograms/kg/hr)	
Dinoprostone 0.75mg in 0.75ml Please note: 1mg = 1000micrograms 1 microgram = 1000 nanograms	**PICU/SORT/post-op cardiac (central or peripheral)**	**Neonates only:** Fixed concentration (1microgram/ml) 50micrograms in 50ml glucose 5% or 10% 1ml/hr = (16.7 ÷ wt) nanograms/kg/min) Usual dose range: 0.3-3ml/kg/hr = 5-50 nanograms/kg/min *CAUTION : 750 micrograms in ampoule – prepare infusion in 2 stages:* *1) Take 0.5ml (500micrograms) of concentrated solution from the ampoule and dilute to 10ml to make a 50microgram/ml solution;* *2) Take 1ml of this 50microgram/ml solution and dilute to 50ml to make a 1microgram/ml solution.*		

Drug & ampoule sizes	**Use**	**Prescription and administration guide** (NS=sodium chloride 0.9%, G=glucose 5% or 10%)	
Dobutamine 250mg in 20ml	**PICU (central)**	**Under 13kg:** mg/kg dilution 15mg/kg in 50ml (G or NS) 1ml/hr = 5micrograms/kg/min Usual dose range: 0.4-2ml/hr = 2-10 micrograms/kg/min	**Over 13kg:** Fixed concentration (5mg/ml) 250mg in 50ml (NS or G) 1ml/hr = (83.3 ÷ wt) micrograms/kg/min Usual dose range: 0.024-0.12ml/kg/hr = 2-10 micrograms/kg/min
Dopamine 200mg in 5ml	**PICU/SORT/post-op cardiac (central)** Single strength	**Single strength (<13kg):** mg/kg dilution 15mg/kg in 50ml (G or NS) 1ml/hr = 5micrograms/kg/min Usual dose range: 0.4-2ml/hr = 2-10 micrograms/kg/min	**Single strength (>13kg):** Fixed concentration (4mg/ml) 200mg in 50ml (NS or G) 1ml/hr = (66.7 ÷ wt) micrograms/kg/min Usual dose range: 0.03-0.15ml/kg/hr = 2-10 micrograms/kg/min
	PICU (central) Double strength	**Double strength (<13kg):** mg/kg dilution 30mg/kg in 50ml (G or NS) 1ml/hr = 10micrograms/kg/min Usual dose range: 0.2-1ml/hr = 2-10 micrograms/kg/min	**Double strength (>13kg):** Fixed concentration (8mg/ml) 400mg in 50ml (NS or G) 1ml/hr = (133 ÷ wt) micrograms/kg/min Usual dose range: 0.015-0.075ml/kg/hr = 2-10 micrograms/kg/min
	PICU/SORT (peripheral) short-term use only Central access required for continuing infusions	**Peripheral (<13kg):** mg/kg dilution 1.5mg/kg in 50ml (G or NS) 1ml/hr = 0.5micrograms/kg/min Usual dose range: 4-20ml/hr = 2-10 micrograms/kg/min	**Peripheral (>13kg):** Fixed concentration (0.4mg/ml) 20mg in 50ml (NS or G) 1ml/hr = (6.7 ÷ wt) micrograms/kg/min Usual dose range: 0.3-1.5ml/kg/hr = 2-10 micrograms/kg/min
Esmolol 100mg in 10ml 2.5g in 250ml	**PICU (central)**	**All ages:** Fixed concentration (10mg/ml) 2.5g in 250ml 1ml/hr= (167 ÷ wt) micrograms/kg/min Usual dose range: 0.15-1.2ml/kg/hr = 25-200micrograms/kg/min Loading dose may be required.	
Fentanyl 100micrograms in 2ml 500micrograms in 10ml	**PICU/SORT (central or peripheral)**	**Under 10kg:** Fixed concentration (20 microgram/ml) 500micrograms in 25ml (G or NS) (or 1000micrograms in 50ml depending on rate of infusion) 1ml/hr= (20 ÷ wt) micrograms/kg/hr Usual dose range: 0.05-0.3ml/kg/hr = 1-6micrograms/kg/hr	**Over 10kg:** Fixed concentration (50 microgram/ml) 1000micrograms in 20ml (neat) (or 2000micrograms in 40ml depending on rate of infusion) 1ml/hr= (50 ÷ wt) micrograms/kg/hr Usual dose range: 0.02-0.12ml/kg/hr = 1-6micrograms/kg/hr

Drug & ampoule sizes	**Use**	**Prescription and administration guide** (NS=sodium chloride 0.9%, G=glucose 5% or 10%)		
Furosemide 20mg in 2ml 50mg in 5ml 250mg in 25ml	**PICU (central or peripheral)**	**Under 5kg:** Fixed concentration (2mg/ml) 50mg in 25ml NS 1ml/hr = (2 ÷ wt) mg/kg/hr Usual dose range: 0.05-0.5ml/kg/hr = 0.1-1mg/kg/hr	**5-20kg:** Fixed concentration (5mg/ml) 250mg in 50ml NS 1ml/hr = (5 ÷ wt) mg/kg/hr Usual dose range: 0.02-0.2ml/kg/hr = 0.1-1mg/kg/hr	**Over 20kg:** Fixed concentration (10mg/ml) 250mg in 25ml (neat) 1ml/hr= (10 ÷ wt) mg/kg/hr Usual dose range: 0.01-0.1ml/kg/hr = 0.1-1mg/kg/hr
Heparin (2022 new update) 1000units in 1ml 5000units in 1ml 20,000units in 20ml *(Caution: Do not use 25,000units in 1ml amps)*	**PICU (central or peripheral)** See Child Health guidelines	**Under 5kg:** Fixed concentration (75units/ml) 1500units in 20ml (NS or G) 1ml/hr = (75 ÷ wt) units/kg/hr Usual dose range: 0.13-0.53ml/kg/hr = 10-40units/kg/hr	**5-20kg:** Fixed concentration (200units/ml) 10,000units in 50ml (NS or G) 1ml/hr = (200 ÷ wt) units/kg/hr Usual dose range: 0.05-0.2ml/kg/hr = 10-40units/kg/hr	**Over 20kg:** Fixed concentration (1000units/ml) 50,000units in 50ml (NS or G) 1ml/hr = (1000 ÷ wt) units/kg/hr Usual dose range: 0.01-0.04ml/kg/hr = 10-40units/kg/hr
Hydralazine 20mg in 1ml	**PICU (central or peripheral)**	**All ages:** Fixed concentration (250micrograms/ml) 10mg in 40ml NS 1ml/hr = (250÷ wt) microgram/kg/hr Usual dose range: 0.05-0.2ml/kg/hr = 12.5-50micrograms/kg/hr		
Immunoglobulin	See Child Health Guidelines	Updated administration guidelines to be inserted		

Drug & ampoule sizes	**Use**	**Prescription and administration guide** (NS=sodium chloride 0.9%, G=glucose 5% or 10%)	
Insulin 100units in 1ml	**PICU (central or peripheral)**	**Under 10kg:** mg/kg dilution 5units/kg in 50ml NS 1ml/hr= 0.1units/kg/hr 0.1-1ml/hr = 0.01-0.1units/kg/hr Flush giving set with at least 20ml of the solution prior to administration.	**Over 10kg:** Fixed concentration (1unit/ml) 50units in 50ml (pre-filled syringe) 1ml/hr= (1÷ wt) unit/kg/hr 0.01-0.1ml/kg/hr = 0.01-0.1units/kg/hr Flush giving set with at least 20ml of the solution prior to administration.
Isoprenaline	**PICU/SORT (central or peripheral)**	**Under 6kg:** 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)	**Over 6kg:** Fixed concentration (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)
Ketamine 200mg in 20ml 500mg in 10ml 500mg in 5ml	**PICU (central or peripheral)** Peripheral max10mg/ml Central max 50mg/ml	**Under 16kg:** mg/kg dilution 30mg/kg in 50ml (NS or G) 1ml/hr = 10micrograms/kg/min Usual dose range: 0.2-4ml/kg = 2-40 micrograms/kg/min	**Over 16kg:** Fixed concentration (10mg/ml) 500mg in 50ml (NS or G) 1ml/hr= (167÷ wt) micrograms/kg/min Usual dose range: 0.012-0.24ml/kg/hr = 2-40 micrograms/kg/min
	Ward strength (see Child Health protocol)	**Ward strength (>10kg):** mg/kg dilution 3mg/kg in 50ml NS 1ml/hr = 1micrograms/kg/min Usual dose range: 0.5-6ml/hr = 0.5-6mcg/kg/min	
Labetalol 100mg in 20ml	**PICU (central or peripheral)**	**Under 6kg:** Fixed concentration (5mg/ml) 200mg in 40ml (neat) 1ml/hr= (5 ÷ wt) mg/kg/hr Usual dose range: 0.2-0.6ml/kg/hr = 1-3mg/kg/hr	**Over 6kg:** Fixed concentration (5mg/ml) 300mg in 60ml (neat) 1ml/hr= (5 ÷ wt) mg/kg/hr Usual dose range: 0.2-0.6ml/kg/hr = 1-3mg/kg/hr

Drug & ampoule sizes	**Use**	**Prescription and administration guide** (NS=sodium chloride 0.9%, G=glucose 5% or 10%)	
Midazolam 10mg in 2ml 10mg in 5ml	**PICU/SORT/post-op cardiac (central or peripheral)** Single strength	**Single strength (SORT may use this for >50kg):** 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 **Over 50kg:** consider changing to fixed concentration	**Single strength (>50kg):** Fixed concentration (1mg/ml) 50mg in 50ml (NS or G) 1ml/hr = (1000 ÷ wt) micrograms/kg/hr Usual dose range: 0.01-0.1ml/kg/hr =10-100micrograms/kg/hr
	PICU/SORT (central or peripheral Double strength	**Double strength:** mg/kg dilution 2mg/kg in 50ml (NS or G) 1ml/hr = 40micrograms/kg/hr Usual dose range: 0.2-2.5ml/hr =10-100micrograms/kg/hr **Over 25kg:** consider changing to fixed concentration	**Double strength (25-50kg):** Fixed concentration (1mg/ml) 50mg in 50ml (NS or G) 1ml/hr = (1000 ÷ wt) micrograms/kg/hr Usual dose range: 0.01-0.1ml/kg/hr =10-100micrograms/kg/hr **Double strength (>50kg):** Fixed concentration (2mg/ml) 100mg in 50ml (NS or G) 1ml/hr = (2000 ÷ wt) micrograms/kg/hr Usual dose range: 0.005-0.05ml/kg/hr =10-100micrograms/kg/hr
	PICU (central or peripheral Quad strength	**Quad strength:** mg/kg dilution 4mg/kg in 50ml (NS or G) 1ml/hr = 80micrograms/kg/hr Usual dose range: 0.1-1.25ml/hr =10-100micrograms/kg/hr **Over 12.5kg:** consider changing to fixed concentration	**Quad strength (12.5-25kg):** Fixed concentration (1mg/ml) 50mg in 50ml (NS or G) 1ml/hr = (1000 ÷ wt) micrograms/kg/hr Usual dose range: 0.01-0.1ml/kg/hr =10-100micrograms/kg/hr **Quad strength (25-50kg):** Fixed concentration (2mg/ml) 100mg in 50ml (NS or G) 1ml/hr = (2000 ÷ wt) micrograms/kg/hr Usual dose range: 0.005-0.05ml/kg/hr =10-100micrograms/kg/hr **Quad strength (>50kg):** Fixed concentration (4mg/ml) 200mg in 50ml (NS or G) 1ml/hr = (4000 ÷ wt) micrograms/kg/hr Usual dose range: 0.0025-0.025ml/kg/hr =10-100micrograms/kg/hr

Drug & ampoule sizes	**Use**	**Prescription and administration guide** (NS=sodium chloride 0.9%, G=glucose 5% or 10%)	
Milrinone 10mg in 10ml	**PICU/SORT/post-op cardiac (central or peripheral)**	**All ages:** 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	
Morphine 10mg in 1ml 30mg in 1ml	**PICU/SORT/post-op cardiac (central or peripheral)** Single strength	**Single strength (SORT may use this for >50kg):** 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 **Over 50kg:** consider changing to fixed concentration	**Over 50kg:** Fixed concentration (1mg/ml) 50mg in 50ml (NS or G) 1ml/hr = (1000 ÷ wt) micrograms/kg/hr Usual dose range: 0.01-0.1ml/kg/hr =10-100micrograms/kg/hr
	PICU/SORT (central or peripheral Double strength	**Double strength:** mg/kg dilution 2mg/kg in 50ml (NS or G) 1ml/hr = 40micrograms/kg/hr Usual dose range: 0.2-2.5ml/hr =10-100micrograms/kg/hr **Over 25kg:** consider changing to fixed concentration	**25-50kg:** Fixed concentration (1mg/ml) 50mg in 50ml (NS or G) 1ml/hr = (1000 ÷ wt) micrograms/kg/hr Usual dose range: 0.01-0.1ml/kg/hr =10-100micrograms/kg/hr **Over 50kg:** Fixed concentration (2mg/ml) 100mg in 50ml (NS or G) 1ml/hr = (2000 ÷ wt) micrograms/kg/hr Usual dose range: 0.005-0.05ml/kg/hr =10-100micrograms/kg/hr
	Ward strength (see Child Health protocol)	**Ward strength (>5kg):** mg/kg dilution 0.5mg/kg in 50ml (NS or G) 1ml/hr = 10micrograms/kg/hr Usual dose range: 0.5-3ml/hr = 5-30mcg/kg/hr	

Drug & ampoule sizes	**Use**	**Prescription and administration guide** (NS=sodium chloride 0.9%, G=glucose 5% or 10%)	
Noradrenaline 4mg in 4ml 20mg in 20ml	**PICU/SORT/post-op cardiac (central)**	**Under 13kg:** mg/kg dilution 0.3mg/kg in 50ml (G or NS) 1ml/hr = 0.1micrograms/kg/min Usual dose range: 0.1-5ml/hr = 0.01 -0.5micrograms/kg/min	**Over 13kg:** Fixed concentration (80micrograms/ml) 4mg in 50ml (NS or G) 1ml/hr = (1.3 ÷ wt) micrograms/kg/min Usual dose range: 0.0075-0.375ml/kg/hr = 0.01 -0.5micrograms/kg/min
Oxycodone 10mg in 1ml 50mg in 1ml	**Ward strength (see Child Health protocol)**	**Over 5years:** mg/kg dilution 0.5mg/kg in 50ml (NS or G) 1ml/hr = 10micrograms/kg/hr Usual dose range: 0.5-3ml/hr = 5-30mcg/kg/hr	
Phenylephrine 10mg in 1ml 1mg in 10ml	**PICU/SORT (peripheral) short-term use only** Central access required for continuing infusions	**All ages:** Fixed concentration (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	
Propofol 200mg in 20ml 500mg in 50ml	**PICU/SORT (central or peripheral)**	**All ages:** Fixed concentration (10mg/ml) 500mg in 50ml (neat) 1ml/hr= (10 ÷ wt) mg/kg/hr Usual dose range: 0.03-0.4ml/kg/hr = 0.3-4mg/kg/hr	
Salbutamol 0.5mg in 1ml 5mg in 5ml	**PICU/SORT (central or peripheral)** maximum peripheral concentration 200micrograms/ml	**All ages:** Fixed concentration (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 . Up to 5mcg/kg/min may be used if tolerated. Loading dose may be required	
	PICU (central)	**All ages:** Fixed concentration (1mg/ml) 50mg in 50ml (neat) 1ml/hr= (16.7÷ wt) micrograms/kg/min Usual dose range: 0.03-0.12ml/kg/hr = 0.5-2micrograms/kg/min . Up to 5mcg/kg/min may be used if tolerated. Loading dose may be required.	

Drug & ampoule sizes	**Use**	**Prescription and administration guide** (NS=sodium chloride 0.9%, G=glucose 5% or 10%)	
Sodium benzoate 1g in 5ml 2g in 10ml	**PICU** **(central or peripheral)**	**All ages:** Fixed concentration (50mg/ml) 2g in 40ml glucose 5% or 10% 1ml/hr= (50 ÷ wt) mg/kg/hr Usual loading dose 250mg/kg over 90mins (3.3ml/kg/hr), followed by 0.2-0.4ml/kg/hr = 10-20mg/kg/hr	
Sodium Nitroprusside 50mg vial (named patient supply)	**PICU** **(central or peripheral)** Protect from light during administration.	**Under 15kg:** mg/kg dilution 3mg/kg in 50ml glucose 5% 1ml/hr = 1microgram/kg/min Usual dose range: 0.5-8ml/hr = 0.5-8micrograms/kg/min Avoid prolonged use (max 4microgram/kg/min if infusion exceeds 24hr)	**Over 15kg:** Fixed concentration (1mg/ml) 50mg in 50ml glucose 5% 1ml/hr= (16.7÷ wt) micrograms/kg/min Usual dose range: 0.03-0.48ml/kg/hr = 0.5-8micrograms/kg/min. Avoid prolonged use (max 4microgram/kg/min if infusion exceeds 24hr)
Sodium phenylbutyrate 1g in 5ml 2g in 10ml	**PICU** **(central or peripheral)**	**All ages:** Fixed concentration (50mg/ml) 2g in 40ml glucose 5% or 10% 1ml/hr= (50 ÷ wt) mg/kg/hr Usual loading dose 250mg/kg over 90mins (3.3ml/kg/hr), followed by 0.2-0.4ml/kg/hr = 10-20mg/kg/hr	
Thiopentone (thiopental) 500mg vial	**PICU** **(central)**	**All ages:** Fixed concentration (25mg/ml) 1500mg in 60ml (neat) 1ml/hr= (25 ÷ wt) mg/kg/hr Usual dose range: 0.04-0.32ml/kg/hr = 1-8mg/kg/hr Loading dose may be required	
Vasopressin (argipressin) 20 units in 1ml	**PICU/SORT/post-op cardiac** **(central)**	**Under 20kg:** mg/kg dilution 1unit/kg in 50ml (G or NS) 1ml/hr = 0.02units/kg/hr Usual dose range: 0.5-6ml/hr = 0.01-0.12units/kg/hr	**Over 20kg:** 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
	PICU **(peripheral or central)** **Diabetes Insipidus**	**All ages:** Fixed concentration 1unit in 500ml NS (increase to 2.5units in 500ml NS if required) Replace previous hours urine output. Titrate to achieve a urine output of 1-3ml/kg/hr	