Paediatric Critical Care Intravenous Infusion Chart – Vasoactive and other commonly used medications

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*See example of calculations for Standard Concentration Infusions and Individualised Weight-based Concentration Infusions on final page

For Standard Concentration Infusions:

Actual Rate (mL/hour) = Actual Dose X Default Rate (mL/hour) / Default Dose

Drug	Patient Group/ Wt range	Dilution Instructions	Compatible Diluents	Flow Rate Calculation: Standard Concentration Infusion (Default rate (mL/hour) = Default dose (dose/kg/time) *(Wt always in kg)*)	Flow Rate Calculation: Individualised Weight-based Concentration Infusion	Typical Dosage Range Special considerations
Adrenaline (Central Line)	<20kg	0.3mg/kg diluted to 50mL final volume	NaCl 0.9%w/v Glucose 5%w/v	⇨	1mL/hour = 0.1microgram/kg/min	0 -0.1microgram/kg/min Max dose:1.5 microgram/kg/min[2]
	>20kg	6mg diluted to 50mL final volume (1mL contains 120 microgram)		(0.025 x Wt)mL/hour = 0.05 microgram/kg/min	n/a	
amIODARONe (Central Line)	<40kg	15mg/kg diluted to 50mL final volume	Glucose 5%w/v	⇨	1mL/hour = 5microgram/kg/min	Step 1 – Load: 5mg/kg (Max 300mg) load over 60 minutes (Concentration must not be less than 0.6mg/mL) Step 2 – Maintenance: 5-15 microgram/kg/min continuous IV infusion[5]. Max dose:1200mg/24hours
	>40kg	600mg diluted to 50mL final volume(1mL contains 12mg)		(0.025 x Wt)mL/hour = 5microgram/kg/min	n/a	
amIODARONe (Peripheral Line)	All patient groups	300mg diluted to 250mL final volume (1mL contains 1.2mg)	Glucose 5%w/v	(0.25 x Wt)mL/hour = 5microgram/kg/min	n/a	Step 1 – Load: 5mg/kg (max 300mg) over 60 minutes Step 2 – Maintenance: 5-15 microgram/kg/min continuous IV infusion[5]. Max dose:1200mg/24hours
amINOPHYLLIne (Central or Peripheral Line)	All patient groups	500mg diluted to 500mL final volume (1mL contains 1mg)	NaCl 0.9%w/v Glucose 5%w/v[1]	(0.5 x Wt)mL/hour = 0.5 mg/kg/hour	n/a	0-1mg/kg/hr[2]

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Actual Rate (mL/hour) = Actual Dose X Default Rate (mL/hour) / Default Dose

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Drug	Patient Group/ Wt range	Dilution Instructions	Compatible Diluents	Flow Rate Calculation: Standard Concentration Infusion (Default rate (mL/hour) = Default dose (dose/kg/time) (Wt always in kg))	Flow Rate Calculation: Individualised Weight-based Concentration Infusion	Typical Dosage Range Special considerations
Atracurium (Central or Peripheral Line)	All patient groups	Use neat (1mL contains 10mg)	n/a	(0.03 x Wt)mL/hour = 300 microgram/kg/hour	n/a	300-1800 microgram/kg/hour (Higher doses are often needed to ensure neuomuscular blockade). [2,3] Ensure adequate ventilation and sedation.
Dinoprostone (Central or Peripheral Line)	≤5kg	50 microgram diluted to 50mL final volume (1mL contains 1microgram) *(see separate guideline for preparation instructions)*	Glucose 5%w/v[1] (preferred)	(0.3 x Wt)mL/hour = 5 nanogram/kg/min	n/a	Dose on advice of consultant cardiologist. 5-10nanogram/kg/min, may be increased up to 20nanogram/kg/min[5]. Doses of 100-180nanogram/kg/min have been used
Dobutamine (Central Line)	< 15kg	15mg/kg diluted to 50mL final volume	NaCl 0.9%w/v Glucose 5%w/v	⇨	1mL/hour = 5microgram/kg/min	2-20microgram/kg/min.[5]
	> 15kg	250mg diluted to 50mL final volume (1mL contains 5mg)		(0.06 x Wt)mL/hour = 5 microgram/kg/min	n/a	
Dobutamine (Peripheral Line)	All patient groups	75mg diluted to 50mL final volume (1mL contains 1.5mg)	NaCl 0.9%w/v Glucose 5%w/v	(0.2 x Wt)mL/hour = 5 microgram/kg/min	n/a	2-20microgram/kg/min.[5]

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Actual Rate (mL/hour) = Actual Dose X Default Rate (mL/hour) / Default Dose

Drug	Patient Group/ Wt range	Dilution Instructions	Compatible Diluents	Flow Rate Calculation: Standard Concentration Infusion (Default rate (mL/hour) = Default dose (dose/kg/time) (*Wt always in kg*))	Flow Rate Calculation: *or* Individualised Weight-based Concentration Infusion	Typical Dosage Range Special considerations
Dopamine (Central Line)	< 15kg	15mg/kg diluted to 50mL final volume	NaCl 0.9%w/v Glucose 5%w/v	⇨	1mL/hour = 5microgram/kg/min	2-20microgram/kg/min.[5]
	> 15kg	250mg diluted to 50mL final volume (1mL contains 5mg)		(0.06 x Wt)mL/hour = 5 microgram/kg/min	n/a	
Dopamine (Peripheral Line)	All patient groups	75mg diluted to 50mL final volume (1mL contains 1.5mg)	NaCl 0.9%w/v Glucose 5%w/v	(0.2 x Wt)mL/hour = 5 microgram/kg/min	n/a	2-20microgram/kg/min.[5]
Glyceryl Trinitrate (Central Line)	<15kg	3mg/kg diluted to 50mL final volume	NaCl 0.9%w/v Glucose 5%w/v	⇨	1mL/hour = 1microgram/kg/min	Initially 0.2-0.5 microgram/kg/min dose adjusted according to response; usual dose 1-3 microgram/kg/min; max 10 microgram/kg/min (do not exceed 200microgram/min)[2]
	>15kg	50mg diluted to 50mL final volume (1mL contains 1mg)		(0.06 x Wt)mL/hour = 1 microgram/kg/min	n/a	
Labetalol (Central Line)	All patient groups	Use neat and give via central line – i.e. 250mg in 50mL final volume (1mL contains 5mg)	Glucose 5%w/v NaCl 0.9%w/v [1]	(0.1 x Wt)mL/hour = 0.5 mg/kg/hour	n/a	0.5 mg/kg/hour adjusted at intervals of at least 15 minutes to response; Max dose: Neonates-4mg/kg/hour 1 month-12 years-3mg/kg/hour 12-18 years- 30-120mg/hour (NOTE not mg/kg/hour for 12-18 years) [2]
Labetalol (Peripheral Line)	All patient groups	50mg diluted to 50mL final volume (1mL contains 1mg)		(0.5 x Wt)mL/hour = 0.5 mg/kg/hour	n/a	

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Drug	Patient Group/ Wt range	Dilution Instructions	Compatible Diluents	Flow Rate Calculation		Typical Dosage Range Special considerations
				Standard Concentration Infusion Default rate (mL/hour) = Default dose (dose/kg/time) *(Wt always in kg)*	***or*** **Individualised Weight-based Concentration Infusion**	
Midazolam (Central Line)	All patient groups	3mg/kg diluted to 50mL final volume	NaCl 0.9%w/v Glucose 5%w/v [1]	⇨	1mL/hour = 1microgram/kg/min	Sedation: 0-4microgram/kg/min Status Epilepticus: 0-24microgram/kg/min[6]
Midazolam (Peripheral Line)	<15kg	3mg/kg diluted to 50mL final volume		⇨	1mL/hour = 1microgram/kg/min	
	>15kg	50mg diluted to 50mL final volume (1mL contains 1mg)		(0.06 x Wt)mL/hour = 1 microgram/kg/min	n/a	
Milrinone (Central or Peripheral Line)	<30kg	1.5mg/kg diluted to 50mL final volume	NaCl 0.9%w/v Glucose 5%w/v	⇨	1mL/hour = 0.5microgram/kg/min	0.5-0.75microgram/kg/min [2]
	>30kg	Use neat and give via central line- i.e. 50mg in 50mL final volume (1mL contains 1mg)		(0.03 x Wt)mL/hour = 0.5 microgram/kg/min	n/a	
Morphine (Central or Peripheral Line)	All patient groups	1mg/kg diluted to 50mL final volume. (max conc:1mg/mL)	NaCl 0.9%w/v Glucose 5%w/v	⇨	1mL/hour = 20microgram/kg/hour	5-20microgram/kg/hour[5] Monitor vital signs May cause respiratory Depression
Noradrenaline (Central Line)	<20kg	0.3mg/kg diluted to 50mL final volume	Glucose 5%w/v NaCl 0.9%w/v	⇨	1mL/hour = 0.1microgram/kg/min	0.02-0.1microgram/kg/min. Adjust according to response. Max dose:1microgram/kg/min [2]
	>20kg	6mg diluted to 50mL final volume (1mL contains 120 micrograms)		(0.025 x Wt)mL/hour = 0.05 microgram/kg/min	n/a	

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For Standard Concentration Infusions:

Actual Rate (mL/hour) = Actual Dose X Default Rate (mL/hour) / Default Dose

Drug	Patient Group/ Wt range	Dilution Instructions	Compatible Diluents	Flow Rate Calculation: Standard Concentration Infusion (Default rate (mL/hour) = Default dose (dose/kg/time) (Wt always in kg))	Flow Rate Calculation: Individualised Weight-based Concentration Infusion	Typical Dosage Range Special considerations
Salbutamol (Central or Peripheral Line)	All patient groups	10mg diluted to 50mL final volume (1mL contains 200 micrograms)	NaCl 0.9%w/v Glucose 5%w/v	(0.3 x Wt)mL/hour = 1microgram/kg/min	n/a	0 – 5 microgram/kg/min[2] caution exceeding adult dosing. Adult dosing 3-20 microgram/min (NOTE not microgram/kg/min)
Sodium Nitroprusside (Central Line)	<15kg	3mg/kg diluted to 50mL final volume	Glucose 5%w/v [1,2]	⇨	1mL/hour = 1microgram/kg/min	0.5 – 8 microgram/kg/min; Max dose:4 microgram/kg/min if for >24hours Protect from light[2]
	>15kg	50mg diluted to 50mL final volume (1mL contains 1mg)		(0.06 x Wt)mL/hour = 1 microgram/kg/min	n/a	
Vasopressin (Central Line)	<15kg	3 units/kg diluted to 50mL final volume	NaCl 0.9%w/v Glucose 5%w/v[1]	⇨	1mL/hour = 1milliunit/kg/min **(NB 1 milliunit = 0.001 units) (1000 milliunits = 1 unit)**	0.3 – 4 milliunits/kg/min[5] (= 0.0003 -0.004 units/kg/min) **(NB 1 milliunit = 0.001 units) (1000 milliunits = 1 unit)**
	>15kg	50 units diluted to 50mL final volume 1mL contains 1000 milliunits (= 1 unit)		(0.03 x Wt)mL/hour = 0.5 milliunits/kg/min	n/a	

References:

1. Medusa Paediatric IV monographs (accessed online 14th August 2017)
2. British National Formulary for Children (BNFc) (accessed online 14th August 2017)
3. Paediatric Injectable Drugs (The Teddy Bear Book) (accessed online 14th August 2017)
4. Handbook of Injectable Drugs (accessed online 14th August 2017)
5. Our Lady's Children's Hospital Crumlin Formulary (Accessed 9/4/18)
6. Sick Kids Toronto Formulary

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Example of rate calculation using Standard Concentration Infusion

A 17kg patient needs a Dopamine infusion (via Peripheral Line)

1. Prepare 75mg / 50mL final volume* NaCl 0.9%w/v as per table (*Final volume = Neat volume + Diluent volume)
   (In this case 1.9mL of Dopamine 40mg/mL + 48.1mL NaCl 0.9%w/v = 50mL final volume)

2. Calculate the "Default rate" for the "Default dose"
   (0.2 x Wt) mL/hour = 5 microgram/kg/min
   (0.2 x 17) mL/hour = 5 microgram/kg/min
   3.4 mL/hour = 5 microgram/kg/min

The infusion is started and titrated to maintain a target MAP.
What flow rate (actual rate) gives a dose of 8 microgram/kg/min (actual dose)?

3. Use the formula to calculate the "Actual Rate"
   – *(colour coding may assist you)*

Actual Rate (mL/hour) = Actual Dose X Default Rate (mL/hour)
Default Dose

$$\text{Actual Rate (mL/hour)} = \frac{8 \times 3.4}{5} = 5.44\text{mL/hour}$$

Example of rate calculation using Individualised Weight-based Concentration Infusion

A 6kg patient needs a Noradrenaline infusion (via Central Line)

1. Calculate the individualised weight-based formula as per table (0.3mg/kg in 50mL)
   0.3 x 6 = 1.8mg

2. Prepare a 1.8mg / 50mL final volume* NaCl 0.9%w/v (*Final volume = Neat volume + Diluent volume)
   (In this case 1.8mL of Noradrenaline 1mg/mL + 48.2mL NaCl 0.9%w/v = 50mL final volume)

3. When run at 1mL/hour this infusion gives a dose of 0.1 microgram/kg/min

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