

## BCCH Critical Care Intermittant IV Dilution Guidelines 2015

Drug, Usual Single Dose	Reconstitution of Vial			Minimum Dilution			Usual Dilution			Comments: [See parenteral manual for details]
	Vial size	Diluent added	Resulting Conc	Infusion Diluent	Max Conc	Max Rate	Infusion Diluent	Usual Conc	Recommended Rate	
<b>ACETAZOLAMIDE</b> 5 mg/kg	500 mg	5 ml SWI	100 mg/ml	undiluted	100 mg/ml	not >500 mg/min	D5W/NS	50 mg/ml	30 minutes	Solution has alkaline pH:9.2. Limited compatibility info. Avoid giving IM.
<b>ACYCLOVIR</b> 10-20 mg/kg	500 mg	10 ml SWI	50 mg/ml	D5W/NS	PVL: 7 mg/ml CVL: 10mg/ml	60 minutes	D5W/NS	7 mg/ml	60 minutes	Phlebitis with conc > 10 mg/ml. Avoid rapid infusions < 60 minutes
<b>ADENOSINE</b> 0.1 mg/kg	6 mg/2 ml	na	3 mg/ml	undiluted	3 mg/ml	1-2 second rapid injection	na	na	na	Follow dose with a flush of 0.9% NaCl. Flushing, dyspnea, headache, AV block
<b>AMIKACIN</b> 7.5 mg/kg	500 mg/2 ml	na	250 mg/ml	D5W/NS	10 mg/ml	30 minutes	D5W/NS	5-10 mg/ml	30 minutes	
<b>AMIODARONE</b> Loading Dose 5 mg/kg	150 mg/3 ml	na	50 mg/ml	D5W/NS	PVL: 2mg/ml CVL: 6 mg/ml	30 minutes (max 30 mg/min)	D5W/NS	PVL:<2 mg/ml	30 minutes	Syringe and syringe pump and in-line 0.22 micron filter required
<b>AMPICILLIN</b> 25-50 mg/kg	250 mg	2.4 ml SWI	100 mg/ml	undiluted	100 mg/ml	3-5 min (max 10 mg/kg/min)	D5W/NS	30mg/ml	30 minutes	Mix and give immediately. Short expiry once reconstituted. Pain at injection site. Give into a large vein if possible. Not within 1 hour of aminoglycoside.
	500 mg	4.8 ml SWI	100 mg/ml							
	1000 mg	9.5 ml SWI	100 mg/ml							
	2000 mg	19 ml SWI	100 mg/ml							
<b>ATROPINE</b> 0.02 mg/kg	0.6 mg/ml	na	0.6 mg/ml	undiluted	0.6 mg/ml	1 minute	na	na	na	Direct injection over a minimum of 1 minute. Bradycardia with slow injection
<b>CALCIUM CHLORIDE</b> 20 mg/kg 0.5 mmol/kg	1000 mg/10 ml (10%) PFS	na	100 mg/ml	undiluted	CVL: 100 mg/mL	100 mg/min	D5W/NS	20 mg/ml	30 minutes	Extravasation causes tissue sloughing. Bradycardia/dysrhythmias with rapid administration.



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<b>DIAZEPAM</b> 0.1- 0.3 mg/kg	10 mg/2 ml	na	5 mg/ml	undiluted	5 mg/ml	3 minutes (max 5 mg/min)	na	na	na	Inject slowly into a large vein over 3 minutes as close to the insertion site as possible
<b>DIAZEPAM EMULSION</b> 0.1-0.3 mg/kg	10 mg/2 ml	na	5 mg/ml	undiluted	5 mg/ml	3 minutes (max 5 mg/min)	na	na	na	Diazepam is incompatible with most IV solutions. Contains propylene glycol
<b>DIGOXIN</b> Check dose	0.25 mg/mL	na	0.25 mg/mL	D5W/NS	PVL: 0.025 mg/ml CVL: 0.05 mg/ml	5 minutes	D5W/NS	0.025 mg/ml	5 minutes	Avoid rapid injection as systemic and coronary vasoconstriction can occur.
<b>DIMENHYDRINATE</b> 1 mg/kg	50 mg/5 ml	na	10 mg/ml	D5W/NS	5 mg/ml	2 minutes	D5W/NS	1-5 mg/ml	15 minutes	Pain at injection site. Changes in blood pressure and ECG
<b>DIPHENHYDRAMINE</b> 1 mg/kg	50 mg/1 ml	na	50 mg/ml	undiluted	50 mg/ml	5 minutes	D5W/NS	1-5 mg/ml	15 minutes	Pain at Injection site. Watch for changes in blood pressure
<b>EPINEPHRINE</b> 0.01 mg/kg	1 mg / 10 ml, 1:10,000 PFS	na	0.1 mg/ml	undiluted	0.1 mg/ml	seconds	na	na	na	Central Line or intraosseous preferred.
<b>ERYTHROMYCIN</b> 10 mg/kg	500 mg	10 ml SWI	50 mg/ml	D5W/NS	10 mg/ml	20 minutes	D5W/NS	2.5-5 mg/ml	30-60 minutes	Thrombophlebitis, Mix and administer immediately
<b>ETHACRYNIC ACID</b> 1 mg/kg	50 mg	25 ml D5W	2 mg/ml	undiluted	2 mg/ml	5-10 minutes (max 10mg/min)	D5W/NS	1 mg/ml	20-30 minutes	Reversible or permanent deafness, tinnitus with rapid administration
<b>FENTANYL</b> 1-2 mcg/kg	0.1 mg/2 ml	na	0.05 mg/ml	undiluted	0.05 mg/ml	1-3 min	D5W/NS	In a convenient volume	1-3 minutes	Administer undiluted/ diluted. Apnea/ chest wall rigidity may occur with rapid injection
<b>FLUCONAZOLE</b> 3-6 mg/kg	200 mg/100 ml	na	2 mg/ml	na	na	na	undiluted	2 mg/ml	2 hrs	Commercial premix to be administered undiluted
<b>FLUMAZENIL</b> 0.01 mg/kg	0.5 mg/5 ml	na	0.1 mg/ml	undiluted	0.1 mg/ml	15-30 seconds	na	na	na	Benzodiazepine antagonist. May precipitate agitation

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<b>FUROSEMIDE</b> 0.5-2 mg/kg	20 mg/2ml	na	10 mg/ml	undiluted	10 mg/ml	over 1-2 min	D5W/NS	2 mg/ml	10 minutes	Max rate 0.5 mg/kg/min and/or max 4 mg/min. Risk ototoxicity
<b>GENTAMICIN</b> 2.5 mg/kg	80 mg/2 ml	na	40 mg/ml	undiluted	40 mg/ml	30 min	D5W/NS	2-4 mg/ml	30 minutes	10 mg/ml conc may be used in neonates to facilitate measurement of small doses.
<b>HALOPERIDOL</b> 0.1 mg/kg	5 mg/1 ml	na	5 mg/ml	undiluted	5 mg/ml	Slow IV push	D5W	Dilute to 1-5 mg/ml	no information	Hypotension, dystonia, QT prolongation. Dermatitis
<b>HEPARIN</b> Load Dose: 75 units/kg	10,000 units/ 10 ml	na	1000 units/ml: *NB: Strength	undiluted	1000 units/ml: *NB: Strength	10-15 min	na	na	na	*NB: Use 1000 unit / ml strength for loading dose. 50 unit/ml bag for IV infusion
<b>HYDROCORTISONE</b> various doses	100 mg	1.8 ml SWI	50 mg/ml	undiluted	50 mg/ml	> 30 seconds	D5W/NS	1 mg/ml	10-30 minutes	Use dilutions of 1-25 mg/ml within 4 hours
<b>HYDROMORPHONE</b> 0.015 mg/kg	2 mg/ml	na	2 mg/ml	undiluted	2 mg/ml	2-3 minutes	D5W/NS	1 mg/ml	2-3 minutes	Respiratory depression with rapid IV injection. 5X potency of morphine
<b>INSULIN regular (Humulin R or Novolin)</b>	1000 Unit/10 ml (F)	na	100 units/ml	undiluted	100 Units/ml	rapid push	na	na	na	
<b>Ketamine</b> 0.5-2 mg/kg	200 mg/20 ml, 500 mg/10 ml	na	10 or 50 mg/ml	undiluted	10 or 50 mg/ml	> 1 minute	D5W/NS	2 mg/ml	> 1 minute	Apnea or enhanced pressor response with rapid injection (max rate: 0.5 mg/kg/min)
<b>KETOROLAC</b> 0.5 mg/kg	30 mg/ml	na	30 mg/ml	undiluted	30 mg/ml	1-5 minutes	D5W/NS	0.3-0.6 mg/ml	15-20 minutes	NSAID. Usual single adult dose is 30 mg. Maximum daily dose 120 mg/day x 5 d
<b>LABETALOL</b> 0.2 mg/kg loading dose	100 mg/20 ml	na	5 mg/ml	undiluted	5 mg/ml	2-3 minutes (max 2 mg/min)	na	na	na	Beta blocker. Monitor HR, BP, ECG.

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<b>LEVO-CARNITINE</b> 50-300 mg/kg/day	1000 mg/5 ml	na	200 mg/ml	undiluted	200 mg/ml	2-3 minutes	NS	0.5-8 mg/ml	20-30 minutes	
<b>LIDOCAINE</b> 1 mg/kg	100 mg/5 ml	na	20 mg/ml	undiluted	20 mg/ml	1-3 minutes (max 50mg/min)	na	na	na	Myocardial depression, hypotension, heart block.seizures,dysphoria. 50 mg/min max
<b>LORAZEPAM</b> 0.05 mg/kg	4 mg/ml (F)	na	4 mg/ml	undiluted or dilute 1:1	2-4 mg/ml	over 2-5 minutes (max 2 mg/min)	na	na	na	Contains benzyl alcohol and propylene glycol. Not > 2mg/min
<b>MAGNESIUM SULFATE</b> 25-50 mg/kg	5000 mg/10 ml	na	500 mg/ml	D5W/NS	200 mg/ml	10-20 mins for resuscitation	D5W/NS	60 mg/ml	2-4 hours	Max 150 mg/min. 500mg/4meq/2mmol/ml Monitor HR, BP, ECG if giving IV push
<b>MANNITOL</b> 0.25 g/kg	20%, 100 g/500 ml	na	200 mg/ml	undiluted	200 mg/ml	3-5 minutes	undiluted	200 mg/ml	15-30 minutes	0.22 micron inline filter. Stored in warmer. hypotension, hyperosmolality
<b>MEROPENEM</b> 20-40 mg/kg	500 mg	NS 10 ml	50 mg/ml	undiluted	50 mg/ml	3-5 minutes	NS	20-40 mg/ml	15-30 minutes	Administer immediately after reconstitution. Vein irritation
	1000 mg	NS 20 ml	50 mg/ml	undiluted	50 mg/ml	3-5 minutes	NS	20-40 mg/ml	15-30 minutes	
<b>METHYLPREDNISOLONE</b> 0.5-1 mg/kg	125 mg	2 ml SWI	62.5 mg/ml	undiluted	62.5 mg/ml	> 1 min	D5W/NS	2.5 mg/ml	Large doses 30-60 minutes	Mix and use immediately. Pulse rx: 30 mg/kg over 30-60 minutes
	1000 mg	15.6 ml SWI	62.5 mg/ml	undiluted	62.5 mg/ml	> 1 min	D5W/NS	2.5 mg/ml	Large doses 30-60 minutes	
<b>METOCLOPRAMIDE</b> 0.1 mg/kg	10 mg/2 ml	na	5 mg/ml	undiluted	5 mg/ml	3-5 minutes	D5W/NS	0.2 mg/ml	15 minutes	Doses > 10 mg in 100 ml over 15-30 min. Acute dystonic reactions occur in children
<b>MIDAZOLAM</b> 0.1 mg/kg	50 mg/10 ml	na	5 mg/ml	undiluted	5 mg/ml	2-3 minutes	na	na	na	Respiratory and CVS depression. In neonates give over 5 minutes
<b>MORPHINE</b> 0.1 mg/kg	10 mg/ml	na	10 mg/ml	D5W/NS	5 mg/ml	5 minutes	D5W/NS	1 mg/ml	20 minutes	Respiratory depression will occur with rapid IV injection.

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NALOXONE 0.01-0.1 mg/kg	0.4 mg/ml	na	0.4 mg/ml	undiluted	0.4 mg/ml	< 30 seconds	na	na	na	Dose may be divided and small portions given until reversal is evident
ONDANSETRON 0.15 mg/kg	4 mg/2 ml	na	2 mg/ml	undiluted	2 mg/ml	2-5 minutes	D5W/NS	1 mg/ml	15 minutes	
PANCURONIUM 0.1 mg/kg	2 mg/ml (F)	na	2 mg/ml	undiluted	2 mg/ml	rapidly over 2-3 seconds	na	na	na	
PENICILLIN G Sodium 25,000 - 100,000 Units/kg	1 MU	1.8 ml SWI	500,000 units/ml	PVL: SWI CVL: undiluted	PVL:146,000 U/ml CVL: 500,000 U/ml	15-30 minutes	SWI	100,000 U/ml	15-30 minutes	Irritating to veins. Can Be further diluted to 25-50,000 units/ml
	10 MU	16.2 ml SWI	500,000 units/ml			15-30 minutes	SWI	100,000 U/ml	15-30 minutes	Not within 1 hour of aminoglycoside
PHENOBARBITAL 2.5-5 mg/kg	30 and 120 mg/ml	na	30 mg/ml and 120 mg/ml	undiluted	120 mg/ml	3-5 minutes	D5W/NS	15 mg/ml	15 minutes	Do not exceed 1 mg/kg/min or 30 mg/min. Loading dose over 60 minutes
PHENOXYBENZAMINE 0.25 mg/kg	10 mg/0.2 ml (F)	4.8 ml NS	2 mg/ml	undiluted	2 mg/ml	20 minutes	na	na	na	First dose by physician. Special Access drug. Hypotension.
PHENYTOIN 2.5 mg/kg	100 mg/2ml	na	50 mg/ml	undiluted	50 mg/ml	1 mg/kg/min (max 50mg/min)	NS only	5 mg/ml	20-30 min (max 1mg/kg/min)	hypotension, arrhythmias. Adults not faster than 50 mg/min.Vein and tissue irritation
PHYTONADIONE 1-2 mg (not per kg)	10 mg/ml	na	10 mg/ml	undiluted	10 mg/ml	max 1 mg/min	D5W/NS	0.2 mg/ml	20 minutes	Hypersensitivity reactions can occur with IV route.
PIPERACILLIN 50-75 mg/kg	2 g	9 ml SWI	200 mg/ml	undiluted	200 mg/ml	3-5 minutes	D5W/NS	10-40 mg/ml	30-60 minutes	Thrombophlebitis. Hypersensitivity reactions.
	3 g	13.5 ml SWI	200 mg/ml	undiluted	200 mg/ml	3-5 minutes	D5W/NS	10-40 mg/ml	30-60 minutes	Not within 1 hour of aminoglycoside
	4 g	18 ml SWI	200 mg/ml	undiluted	200 mg/ml	3-5 minutes	D5W/NS	10-40 mg/ml	30-60 minutes	

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Piperacillin-Tazobactam	4.5 g	20 ml SWI	172 mg/ml (piperacillin)	undiluted	172 mg/ml (piperacillin)	30 minutes	D5W/NS	10-40 mg/ml (piperacillin)	30 minutes	Not within 1 hour of aminoglycoside
POTASSIUM CHLORIDE 0.5 mEq/kg	Prediluted 15 mEq/30 ml (F)	na	0.5 mEq / ml	undiluted	PVL: 0.06 mEq/ml CVL: 0.5 mEq/ml	60 min	na	na	na	Administer 0.5 mEq/kg by slow infusion centrally over 1 hour by syringe pump
POTASSIUM Phosphate 0.33 mmol/kg (PO4)	30 mmol PO4/ 10 ml	na	3 mmol PO4 + 4.4 mEq K/ml	D5W/NS	CVL: 0.3 mmol/ml (PO4)	6 hours (0.06 mmol PO4/kg/hr)	D5W/NS	PVL:0.04mmol/L CVL:0.05mmol/ml	6 hours	Consider as a potassium slow infusion, central line, syringe pump.
PROPOFOL 2-3 mg/kg	10 mg/ml in lipid emulsion	na	10 mg/ml	undiluted	10 mg/ml	30 seconds	na	na	na	Hypotension.
PROPRANOLOL 0.01-0.1 mg/kg	1 mg/ml	na	1 mg/ml	undiluted	1 mg/ml	10 minutes (max 1 mg/min)	D5W/NS	No information	10-15 minutes	Monitor ECG and CVP. Hypotension or bradycardia with rapid injection.
RANITIDINE 1.5 mg/kg	50 mg/2 ml	na	25 mg/ml	D5W/NS	2.5 mg/ml	5 minutes (max 10 mg/min)	D5W/NS	0.5-2 mg/ml	15-30 minutes	Rapid injection can cause bradycardia and hypotension. Hypersensitivity reactions.
ROCURONIUM 1 mg/kg	50 mg/5 ml, (F)	na	10 mg/ml	undiluted	10 mg/ml	2-3 seconds	na	na	na	
SODIUM BICARBONATE 1 mEq/kg	8.4%, 50 ml, 1 mEq/ml	na	1 mEq/ml	undiluted	1 mEq/ml	max 1 mEq/kg/min	D5W	0.5 mEq/ml	max 1 mEq/kg/min	Hyperosmolar: > 2 yrs: 8.4%, <2 yrs: 4.2%. *Rapid push reserved for CPR
SODIUM PHOSPHATE 0.33 mmol/kg (PO4)	30 mmol PO4 /10 ml	na	3 mmol PO4 + 4 mEq Na/ml	D5W/NS	CVL: 0.3 mmol/ml (PO4)	6 hours	D5W/NS	PVL: 0.05mmol/ml CVL:0.12 mmol/ml	6 hours	Higher concentrations in PVL may cause thrombophlebitis
SUCCINYLCHOLINE 1-2 mg/kg	200 mg/10 ml (F)	na	20 mg/ml	undiluted	20 mg/ml	10-30 seconds (Flush needle)	na	na	na	Support ventilation. Physician supervision required. Contraindicated in hyperkalemia

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<b>TOBRAMYCIN</b> 2.5 mg/kg	80 mg/2 ml	na	40 mg/ml	undiluted	40 mg/ml	30 minutes	D5W/NS	2-4 mg/ml	30 minutes	Neonates: 10 mg/ml concentration may facilitate measurement of small doses
<b>VANCOMYCIN</b> 15-20 mg/kg	500 mg	10 ml SWI	50 mg/ml	D5W/NS	PVL: 5 mg/ml CVL: 10 mg/ml	60 minutes	D5W/NS	5 mg/ml	60 minutes	May cause hypotension and flushing

**Legend:**

Drug: generic name. Dose: usual single dose. D5W/NS: Compatible with dextrose or saline in various concentrations. SWI: Sterile Water for Injection. F: Refrigerate. R or RT: Room Temperature. P or PVL: Peripheral Venous Administration. C or CVL: Central

Prepared by Pharmacy and ICU Nursing 2004 by John Macready. Revised July 2010, March 2011, and Feb 2015. Contact Roxane Carr, PICU Pharmacist, for concerns.

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