Neonatal Drug Dosing Guidelines

January 05, 2024 12:23 PM

acetaminophen - [Tylenol]

November 2022: For printable patient information on managing pediatric pain and fever at home during acetaminophen shortage please click here

Refer to 6 Steps to Success in Pill Swallowing and Tips on Success in Pill Swallowing to support patients during the shortage.

***Intravenous acetaminophen must be ordered by a staff prescriber* with Anesthesia / General Surgery / Hematology/Oncology / Neurosurgery / NICU / PICU**

Injection is restricted to NICU patients who meet one or more of the following indications:

- **Post-operative pain management (when strict NPO and unable to take acetaminophen rectally)**
- **Treatment of PDA**
- **Surgery lasting longer than 6 hours (one dose)**

Maximum number of doses before reassess is described in the order set linked below.

General

10-15 mg/kg/dose PO/PR every 6 to 8 hours PRN
Maximum: 60 mg/kg/24 hours

Post-operative Analgesia

Go to clinical order set IWK NIPO "NICU Post-Operative Orders"

Patent Ductus Arteriosus (PDA) Closure

Go to clinical order set IWK PDA "Patent Ductus Arteriosus (PDA) Pharmacological Treatment in NICU

Supplied: Injection: 10 mg/mL
Solution: 32 mg/mL
Suppository: 30 mg **IWK Compounded**, 60 mg **IWK Compounded**, 120 mg, 325 mg, 650 mg
Suspension: 32 mg/mL
Tablet: 325 mg, 500 mg
Tablet, Chewable: 160 mg

acetaZOLAMIDE

Renal Adjustment

Hypochloremic metabolic alkalosis

5 mg/kg/dose PO every 6 to 8 hours
Supplied: Suspension: 25 mg/mL **IWK Compounded**
Tablet: 250 mg

acetylcysteine - [N-acetylcysteine, NAC]

Renal Adjustment

Meconeum Ileus

All routes of administration for this indication use the 50 mg/mL solution.

Oral/NG (NG route is preferred due to bitter taste)

250-500 mg PO/NG every 6 to 12 hours If NG route, clamp NG tube for 30 minutes after each instillation.

Rectal/Irrigation
Greater than 2 kg

1000 mg PR every 12 hours . May be given up to every 6 hours.

Antidote

Go to Atlantic Canada Poison Centre Antidote Kit for information on antidote dosing. Use SINGLE CONCENTRATION protocol and use PICU drug library pump entries.

Comments

- Enteral (oral or NG) and rectal routes may be used at the same time

Supplied: Injection: 200 mg/mL
Solution: 50 mg/mL **IWK Compounded**

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acyclovir

- Acyclovir may precipitate in kidneys if the patient is dehydrated.
  - Ensure adequate hydration during and for at least 2 hours following administration.
  - Manufacturer suggests 1 litre of fluid/24 hours/gram of acyclovir and recommends a minimum urine output of 500 mL/24 hours/gram of acyclovir

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Various Indications

Go to Firstline

Comments

- Go to Body Surface Area (BSA) Calculator for Suppressive Therapy Following Parenteral Therapy for HSV CNS /Disseminated / SEM Disease
- Premature neonates less than 34 weeks gestational age may require an extended dosing interval. Consult Infectious Disease for guidance.

Supplied: Injection: 50 mg/mL
Suspension: 40 mg/mL
Tablet: 200 mg

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adenosine

Supraventricular Tachycardia (SVT)

Go to Adenosine for Termination of Supraventricular Tachycardia (SVT) Calculator

Comments

- The effects of adenosine may be decreased by methylxanthines (such as caffeine and theophylline) and larger doses may be required.

Supplied: Injection: 3 mg/mL

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alprostadil - [Prostaglandin E1]

Ductus Arteriosus Patency

Ordered as: ____microgram/kg/min

Loading Dose
None

Initial Dosing
0.01 - 0.1 micrograms/kg/min IV continuous

Suggested Titration

0.01 - 0.05 micrograms/kg/min. Once therapeutic response is achieved, reduce rate to lowest effective dose to maintain oxygenation.

Usual Range

0.01 - 0.1 micrograms/kg/min IV continuous

Maximum: 0.4 microgram/kg/min
Supplied: Injection: 500 micrograms/mL

alteplase (CVAD occlusion/parapneumonic effusion) - [Cathflo]

CVAD Occlusion

Go to Medication Management Policy 30.52 (CVAD: Management of Partial and Total Occulsions)

Go to clinical order set IWK CVADUN "Management of Partial or Total CVAD Occulsions with Alteplase (Cathflo*)

Supplied: Injection: 2 mg

amino acids (Primene) - [parenteral nutrition, Primene]

Go to IWK Compatibility Chart for:

- TPN
- SMOF Lipid
- Intralipid

Go to IWK Policy 30.70 "Parenteral Nutrition"

Go to clinical order set IWK NEPANU "PRIMENE (10 kg and less) PARENTERAL NUTRITION (PN) ORDER"

Comments
Calcium/Phosphate Solubility Charts

Note: Calcium = mEq / 100 mL Phosphate = mmol / 100 mL
Charts are guides only. Please contact Pharmacy, Sterile Service @ 470- 8661 for further solubility information.

Amino Acid (Primene®)													
1%		1.5%		2%		2.5%		3%		3.5%		4%	
Calcium	Phosphate	Calcium	Phosphate	Calcium	Phosphate	Calcium	Phosphate	Calcium	Phosphate	Calcium	Phosphate	Calcium	Phosphate
0.5	2.3	0.5	2.6	0.5	4.0	0.5	4.2	0.5	4.5	0.5	5.0	0.5	5.4
1.0	1.7	1.0	2.3	1.0	3.4	1.0	3.6	1.0	3.8	1.0	4.6	1.0	4.6
1.5	1.3	1.5	2.2	1.5	2.6	1.5	3.0	1.5	3.5	1.5	3.5	1.5	4.2
2.0	1.1	2.0	1.8	2.0	2.3	2.0	2.6	2.0	3.3	2.0	3.3	2.0	3.8
3.0	0.85	3.0	1.2	3.0	1.8	3.0	2.2	3.0	2.5	3.0	2.5	3.0	3.2
4.0	0.72	4.0	1.0	4.0	1.25	4.0	1.9	4.0	2.3	4.0	2.3	4.0	2.6
5.1	0.35	5.0	0.75	5.0	1.25	5.0	1.6	5.0	2.1	5.0	2.1	5.0	2.6

Supplied: Injection: 10 %

aminophylline

Renal Adjustment

Diuresis

0.2-0.4 mg/kg/hour IV continuous infusion
Supplied: Injection: 25 mg/mL

amiodarone

Intravenous

Continuous Infusion

Ordered as: ____microgram/kg/min

Loading Dose

5 mg/kg/dose IV once which may be repeated once. Followed by:

Initial Dosing
5 microgram/kg/min

Suggested Titration
1- 2.5 microgram/kg/min

Usual Range
5-10 microgram/kg/min
Maximum: 15 microgram/kg/min

Intermittent
Loading Dose
5 mg/kg/dose IV once which may be repeated once. Followed by:

Maintenance

5 mg/kg/dose IV every 12 to 24 hours

Oral

Loading Dose

5-10 mg/kg/dose PO every 12 hours for 7-10 days or until control is achieved

Maintenance

5-10 mg/kg/dose PO daily
Supplied: Injection: 50 mg/mL
Suspension: 5 mg/mL **IWK Compounded**
Tablet: 200 mg

amoxicillin

Renal Adjustment

General

Go to Firstline

Pneumococcal infection prophylaxis, anatomic or functional asplenia (e.g, sickle cell disease)

10 mg/kg/dose PO BID
Supplied: Capsule: 250 mg, 500 mg
Suspension: 50 mg/mL

amoxicillin|clavulanate - [Clavulin]

- **All doses expressed in terms of amoxicillin component. All orders must be written in terms of amoxicillin component.**
- **Maximum total dose of amoxicillin is 4000 mg regardless of weight.**

- **October 2022: shortage of amoxicillin clavulanate oral suspensions -** Please try to conserve the use of these formulations. Only choose if it is optimal therapy for the syndrome being treated and if tablets or part tablets are not feasible. For alternative therapy, please refer to Firstline for further guidance.
- **The 4:1 (25 mg/mL) oral formulation should be the only product used for neonates.**
- **Using a product with incorrect amoxicillin/clavulanate could result in sub-therapeutic clavulanate concentrations or severe diarrhea. This formulation provides the correct ratio for this age group.**

Renal Adjustment ☑

Various Indications

Go to Firstline

Supplied: Injection: 2000|200 mg
Suspension: 25|6.25 mg/mL, 80|11.4 mg/mL
Tablet: 875 |125 mg, 500|125 mg

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amphotericin B deoxycholate (conventional) - [Fungizone]

- **Medication errors, including deaths, have resulted from confusion between lipid-based forms of amphotericin (Abelcet®, AmBisome®) and amphotericin B deoxycholate (conventional) (Fungizone®) for Injection.**
- **Given the potential for infusion related reactions, prescribers should consider completing order set IWK PRHY DRUG HYPERSENSITIVITY OR TRANSFUSION REACTION TREATMENT or ordering additional medications required for as needed management of rigors.**
- **Amphotericin B deoxycholate (conventional, Fungizone®) is the preparation of choice in neonates.**

Renal Adjustment ☑

Antifungal

Go to Firstline

Supplied: Injection: 50 mg

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amphotericin B liposomal - [AmBisome]

- **Medication errors, including deaths, have resulted from confusion between lipid-based forms of amphotericin (Abelcet®, AmBisome®) and amphotericin B deoxycholate (conventional, Fungizone®) for Injection**
- **Given the potential for infusion related reactions, prescribers should consider completing order set IWK PRHY DRUG HYPERSENSITIVITY OR TRANSFUSION REACTION TREATMENT or ordering additional medications required for as needed management of rigors.**
- **Amphotericin B deoxycholate (conventional, Fungizone®) is the preparation of choice in neonates.** Go to Amphotericin B deoxycholate drug dosing guidelines.

Antifungal

Go to Firstline

Comments
- Monitor renal, hepatic, electrolyte and hematologic status closely.
- Avoid other nephrotoxic drugs. Do not mix with any other drugs

Supplied: Injection: 50 mg

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ampicillin

- May be suitable for IV to PO conversion. Go to Guidelines

Renal Adjustment

Various Indications

Go to Firstline

Supplied: Injection: 250 mg, 1 gram(s)

arginine

Management of hyperammonemia

Urea Cycle Disorder (UCD) Treatment

Go to clinical order set IWK EMMA "Emergency Management of Hyperammonemia"

Supplied: Injection: 250 mg/mL
Powder: 0

atropine

Pre-Intubation

Non-emergent

Go to clinical order set IWK NEINT Non−Emergent Intubation in NICU Pre−Medication Orders

Emergent

Go to Neonatal Resuscitation/Pre-Intubation Medications Calculator

Bradycardia

0.01-0.02 mg/kg/dose IV/IM may be repeated every 10-15 minutes PRN
Maximum: 0.04 mg/kg TOTAL DOSE

End of Life Care

Newborns within the Women's & Newborn Health Programs

Go to Policy 4.45 End of Life Care for Newborns within the Women's & Newborn Health Program Policy

Go to clinical order set IWK ENLICA "End of Life Care for Newborns"

Supplied: Drops, Ophthalmic: 1 %
Injection: 0.2 mg/mL, 0.4 mg/mL, 0.6 mg/mL, 0.1 mg/mL

azithromycin

- **May be suitable for IV to PO conversion. Go to Guidelines**
- **One study suggested that there is 3-8 fold risk of pyloric stenosis with use of azithromycin in neonates. Therefore clinicians need to weigh benefits and risks when considering whether to use azithromycin in young infants.**

Renal Adjustment

Various Indications

Go to Firstline

Supplied: Injection: 500 mg
Suspension: 40 mg/mL
Tablet: 250 mg

bevacizumab - [Avastin, or biosimilars]

Retinopathy of Prematurity (ROP) Type 1

(Off label)

0.625 mg (0.025 mL) per affected eye intravitreal
Supplied: Injection: 25 mg/mL

bovine lipid extract surfactant - [bLES]

Note: 27 mg phospholipid = 1 mL

Surfactant

5 mL/kg/dose instillation once
Comments
Go to BLES website or more information on the product (e.g. FAQ etc)

Supplied: Endotracheal Instillation: 27 mg/mL

caffeine

- **Doses expressed as mg of caffeine base**

Apnea of Prematurity

Loading dose

10 mg/kg/dose IV/PO once

Maintenance *(to start 24 hours after loading dose)*

2.5-5 mg/kg/dose IV/PO every 24 hours

Go to order set IWK ADOR NICU Admission Orders

Comments
- Consider withholding dose if heart rate is greater than 180 beats/minute
- Signs of toxicity include jitteriness, irritability, vomiting/feeding intolerance, tachycardia or arrhythmias

Supplied: Injection: 10 mg (as base)/mL
Syrup: 10 mg (as base)/mL

calcium (oral)

- **All doses expressed in terms of mg of elemental calcium. All orders must be written in terms of mg of elemental calcium**
- **Equivalencies**
  500 mg calcium carbonate =200 mg elemental calcium = 10 mEq elemental calcium = 5 mmol elemental calcium

Hypocalcemia

8.3-25 mg/kg/dose PO every 4 hours
Maximum: 1000 mg/24h

or

12.5-37.5 mg/kg/dose PO every 6 hours
Maximum: 1000 mg/24h

Supplementation for Preterm Neonates

5-10 mg/kg/dose PO BID to QID
Maximum: 80 mg/kg/24h
Comments

- Separate administration by at least 2 hours from phosphate or iron containing supplements.
- Prescribed amount may not correlate with these recommendations depending on biochemical markers or mineral content of enteral feeds.

Supplied: Liquid (as lactogluconate): 20 mg (as elemental)/mL
Tablet (as carbonate): 500 mg (as elemental)
Tablet, Chewable (as carbonate): 200 mg (as elemental), 400 mg (as elemental)

calcium gluconate

- **Dose expressed in terms of mg of calcium gluconate. All orders must be written in terms of mg of calcium gluconate**
- **Equivalencies**
  100 mg calcium gluconate = 9.3 mg elemental calcium = 0.465 mEq elemental calcium = 0.23 mmol elemental calcium

Renal Adjustment

Symptomatic Hypocalcemia

Acute Treatment

100-200 mg/kg/dose IV

Hypocalcemia

Maintenance

Intermittent

50-200 mg/kg/dose IV every 6 hours

Continuous IV Infusion

8-33 mg/kg/hour IV continuous infusion
Supplied: Injection: 100 mg/mL

captopril

IWK recommends:

- **Monitor blood pressure every 30 minutes x 2 hours with initial dose and with each increase in dose**
- **Contact prescriber for a 20% or greater decrease in systolic blood pressure**

For information on administration of liquid via Dissolve-A-Dose, go to Policy 20.09

Renal Adjustment

Premature Neonates

0.01-0.05 mg/kg/dose PO every 8 to 12 hours titrate dose and interval based on response

Term Neonates

0.05-0.1 mg/kg/dose PO every 8 to 24 hours titrate dose and interval based on response up to:
Maximum: 0.5 mg/kg/dose
Comments
Neonatal Family Resource: Captopril with Dissolve-A-Dose Information Sheet

Supplied: Solution, Dissolve A Dose: 1 mg/mL **IWK Compounded**
Tablet: 12.5 mg, 50 mg

carbomer|sorbitol - [Eye Lubricant Gel]

Current contract brand: Tear-Gel

Ordered as: "Eye lubricant gel"

Gel form is typically reserved for use by ophthalmology as a preferred lubricant with specific eye examinations.

Ophthalmic

Manufacturer recommended

1 drops in affected eye(s) TID to QID PRN
Supplied: Gel, Ophthalmic: 0|0

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caspofungin

Various Indications

Go to Firstline

Supplied: Injection: 50 mg

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ceFAZolin

- **There is a small risk of cross-reactivity in patients with a true penicillin allergy; use caution in patients with previous anaphylactic reactions to penicillins. Go to IWK Beta Lactam Allergy Information**

Renal Adjustment ☑

Various Indications

Go to Firstline

Peritonitis

Intraperitoneally

Go to order set IWKPERPR Peritonitis Protocol Orders

Supplied: Drops, Ophthalmic: 50 mg/mL **IWK Compounded**
Injection: 2 gram(s) (10 mL Prefilled Syringe) **IWK Compounded**, 1 gram(s)

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cefoTAXime

- **There is a small risk of cross-reactivity in patients with a true penicillin allergy; use caution in patients with previous anaphylactic reactions to penicillins. Go to IWK Beta Lactam Allergy Information**

Renal Adjustment ☑

Various Indications

Go to Firstline

Treatment of Neisseriae gonorrhoeae Ophthalmia Neonatorum

100 mg/kg/dose IV/IM once

Peritonitis

Intraperitoneally

Go to 2012 ISPD Consensus Guidelines for the Prevention and Treatment of Catheter-Related Infections an Peritonitis in Pediatrics Receiving PD

Supplied: Injection: 1 gram(s)

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ceFOXitin

- **There is a small risk of cross-reactivity in patients with a true penicillin allergy; use caution in patients with previous anaphylactic reactions to penicillins. Go to IWK Beta Lactam Allergy Information**

Renal Adjustment ☑

Various Indications

Go to Firstline

Supplied: Injection: 1 gram(s)

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ceftAZIDime

- **There is a small risk of cross-reactivity in patients with a true penicillin allergy; use caution in patients with previous anaphylactic reactions to penicillins. Go to IWK Beta Lactam Allergy Information**

Renal Adjustment ☑

Various Indications

Go to Firstline

Peritonitis

Intraperitoneally

Go to order set IWKPERPR Peritonitis Protocol Orders

Supplied: Injection: 1 gram(s)

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cefTRIAXone

- **There is a small risk of cross-reactivity in patients with a true penicillin allergy; use caution in patients with previous anaphylactic reactions to penicillins. Go to IWK Beta Lactam Allergy Information**

Renal Adjustment ☑

Generally other third generation cephalosporins (i.e. cefotaxime) are preferred in neonates due to the risk of bilirubin encephalopathy (kernicterus) and fatal reactions caused by calcium-ceftriaxone precipitates. *(IWK Infectious Disease)* Go to cefoTAXime

Treatment of Neisseriae gonorrhoeae Ophthalmia Neonatorum

Go to order set IWKNEAD "Newborn Admission Orders"

Supplied: Injection: 1 gram(s)

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cephALEXin

- **There is a small risk of cross-reactivity in patients with a true penicillin allergy; use caution in patients with previous anaphylactic reactions to penicillins.** **Go to IWK Beta Lactam Allergy Information**

Renal Adjustment

Various Indications

Go to Firstline

Supplied: Suspension: 50 mg/mL
Tablet: 250 mg

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chloral hydrate

- **Chloral hydrate has sedative properties only and does not provide any analgesia**

Renal Adjustment

Procedural Sedation

25-50 mg/kg/dose PO/PR 30-60 minutes prior to procedure.
Maximum: 100 mg/kg/24h
Comments

- Limited data available, however diluted oral liquid has been administered rectally. Use rectal route only if oral route not available (irritating to mucous membranes).
- Minimize unpleasant taste and gastric irritation by administering with water or infant formula.
- Repeated dosing can lead to drug and metabolite accumulation.

Supplied: Syrup: 100 mg/mL

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cholecalciferol - [Vitamin D]

Doses MUST be rounded when ordered, to accommodate the available strengths (shown below)

Supplementation

Breastfed neonates

Supplementation should continue for ALL infants until they are consuming 1000 mL/24 hours or more of vitamin D fortified infant formula or whole milk

400 unit(s) PO daily
Comments
Neonatal Family Resource: Vitamin D Drops Information Sheet

Supplied: Drops, Oral: 400 units/drop
Tablet: 400 units, 1000 units, 10000 units

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ciprofloxacin

- **Ciprofloxacin suspension should NOT be given via an enteral feeding tube (e.g. g-tube) route.** Crushed whole or portioned ciprofloxacin (regular) tablets can be given via tube, but should not be administered concurrently with enteral feedings. Discontinue feed for 1 to 2 hours prior to and after ciprofloxacin administration. Doses may be need to be adjusted to allow for the use of tablets (e.g. 1/4 of 250 mg tab = 62.5 mg)

Renal Adjustment

Various Indications

Go to Firstline

Peritonitis

Intraperitoneally

Go to 2012 ISPD Consensus Guidelines for the Prevention and Treatment of Catheter-Related Infections an Peritonitis in Pediatrics Receiving PD

Supplied: Injection: 2 mg/mL
Suspension: 100 mg/mL
Tablet: 250 mg, 750 mg

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cisatracurium

IV Continuous

Ordered as: ____microgram/kg/min

Loading Dose
100 microgram/kg/dose x 1

Initial Dosing
2 microgram/kg/min

Suggested Titration
0.5 microgram/kg/min every 30 minutes

Usual Range
1-2 microgram/kg/min

Maximum
10 microgram/kg/min (not well established)

Supplied: Injection: 2 mg/mL

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clindamycin

- **February 2023:** shortage of all forms of parenteral clindamycin
- **Use is reserved to treatment of necrotizing fasciitis and STSS (Streptococcal Toxic Shock Syndrome)**
- Refer to IWK Firstline for guidance on most appropriate - clindamycin is not first line therapy for most infectious syndromes
- If clindamycin is being ordered due to allergy, ensure allergy has been thoroughly assessed. Refer to IWK Firstline - De-labelling Penicillin Allergy

Renal Adjustment

Various Indications

Go to Firstline

Peritonitis

Intraperitoneally

Go to 2012 ISPD Consensus Guidelines for the Prevention and Treatment of Catheter-Related Infections an Peritonitis in Pediatrics Receiving PD

Supplied: Capsule: 150 mg
Injection: 18 mg/mL, 150 mg/mL
Solution: 15 mg/mL

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cloNIDine

Renal Adjustment

Adjunct Treatment of Neonatal Abstinence Syndrome

1 microgram/kg/dose PO every 3 to 6 hours . Wean as per guidelines below.

Withdrawal Management for Opioids and Sedatives

1-2 microgram/kg/dose PO every 6 hours until opioid is stopped. Then wean as per guidelines below.

Comments

Weaning Guidelines

- Decrease dose to 1 microgram/kg/dose, then as tolerated decrease frequency to:
  - every 8 to 12 hours for 24 hours, then as tolerated decrease frequency to:
  - every 24 hours for 24 hours, then discontinue.
- Monitor blood pressure every 12 hours

Supplied: Suspension: 10 micrograms/mL **IWK Compounded**
Tablet: 100 microgram(s), 25 microgram(s)

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clotrimazole - [Canesten]

Antifungal

Topical

Manufacturer recommended

Topically to affected area BID
Supplied: Cream, Topical: 1 %
Cream, Vaginal: 1 %

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cloxacillin

- **Oral cloxacillin is not usually recommended as absorption is poor**

Various Indications

Go to Firstline

Supplied: Injection: 2 gram(s)

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cosyntropin

ACTH Stimulation Test

Low Dose

1 microgram(s) IV once

Standard Dose

15 microgram/kg/dose IV/IM once
Supplied: Injection: 250 microgram(s)

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cyclopentolate|phenyLEPHrine - [Cyclomydril]

Eye Dilation

Go to Clinical Order Set IWK_EYDI "EYE DILATION ORDER NICU"

Supplied: Drops, Ophthalmic: 0.2|1 %

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dexamethasone

Go to IWK Chemotherapy Administration Standards document

Airway Edema or Extubation

0.25 mg/kg/dose IV 4 hours prior to extubation and then q8h for 3 doses total
Maximum: 1.5 mg/kg/24h

Chronic Lung Disease of Prematurity (CLD)

"DART" Protocol -use 0.05 mg/mL oral solution for PO doses less than 0.1 mg

Step 1

0.075 mg/kg/dose IV/PO every 12 hours for 6 doses

Step 2

0.05 mg/kg/dose IV/PO every 12 hours for 6 doses

Step 3

0.025 mg/kg/dose IV/PO every 12 hours for 4 doses

Step 4

0.01 mg/kg/dose IV/PO every 12 hours for 4 doses
Comments

- Refer to Comparative Dosage Table: Corticosteroids Properties and Potencies

Supplied: Injection: 10 mg/mL
Ointment, Ophthalmic: 0.1 %
Solution: 0.05 mg/mL **IWK Compounded**
Suspension: 1 mg/mL **IWK Compounded**
Suspension, Ophthalmic: 0.1 %
Tablet: 0.5 mg, 4 mg

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dexmedetomidine

Analgesia/Sedation

IV Continuous
Ordered as: ___microgram/kg/hour

Loading Dose
Not usually required
0.5 – 1 microgram/kg/dose x 1

Initial Dosing
0.1 – 0.3 microgram/kg/hour IV continuous

Suggested Titration
0.1 microgram/kg/hour every 1 to 2 hours PRN

Usual Range
0.2 – 0.7 microgram/kg/hour IV continuous

Maximum: 1 microgram/kg/hour
Comments
Weaning Guidelines

- Wean infusion by 0.1 microgram/kg/hour every 12 to 24 hours as tolerated
- Once at 0.5 micrograms/kg/hour or less, consider starting clonidine. Discontinue dexmedetomidine infusion 12 to 24 hours after starting clonidine.

Supplied: Injection: 4 micrograms/mL, 100 micrograms/mL

dextran 70|hydroxypropyl methylcellulose - [Eye Lubricant Drop]

- *Current contract brand: Tears Naturale Free (preservative free) minims*

Order as: "Eye lubricant drop"

Ophthalmic

Manufacturer recommended

0 to 2 drops in affected eye(s) as needed
Supplied: Drops, Ophthalmic: 0.1|0.3 %

dextrose - [Glucose]

The term glucose and dextrose are often used interchangeably.

Note: Each 31 gram tube of InstaGlucose* contains 10 grams of dextrose equivalent to 24 grams of carbohydrate

Available dextrose containing IV solutions at IWK Supply and Distribution

Refractory Hypoglycemia

Note: In order set below the dosing for oral route is on Page 1 & parenteral is on page 2

Go to clinical order set IWKORGL "Oral Glucose Liquid for Treatment of Neonatal Hypoglycemia"

Supplied: Gel: 40 % (31 G Tube) , 40 % (2.5 mL Syringe)
Injection: 0.1 gram/mL, 0.125 gram/mL (250 mL Bag) **IWK Compounded**, 0.15 gram/mL (250 mL Bag) **IWK Compounded**, 0.2 gram/mL (250 mL Bag) **IWK Compounded**, 0.5 gram/mL (50 mL Prefilled Syringe) , 0.5 gram/mL (50 mL Vial)
Tablet: 4 gram(s)

diazoxide

Renal Adjustment

Hyperinsulinemic Hypoglycemia

3.3 mg/kg/dose PO every 8 hours titrated to effect with a usual range of 8-15 mg/kg/24h divided q8-12h
Comments

- ***IWK Endocrinology-recommended in hospital blood glucose monitoring guidelines for patients receiving diazoxide:***

  Note:

  1) Endocrinology to order patient-specific monitoring parameters (using the chart below as guidance)

  2) No changes to the frequency of blood glucose monitoring (beyond chart below) should be made without the involvement of Endocrinology

Scenario	Point of Care Blood Glucose Monitoring
Upon initiation of diazoxide **OR** **With any diazoxide dose change**	**Four times daily**
On a stable diazoxide dose	**Twice Daily**
Any low blood glucose for patient receiving diazoxide	**Repeat blood glucose within 30 minutes of hypoglycemia treatment (hypoglycemia treatment per Endocrinology orders)**

Supplied: Suspension: 10 mg/mL **IWK Compounded**

digoxin

Renal Adjustment

"Digitalizing"/Loading Dose

Premature Neonate

Oral

10-15 microgram/kg/dose PO once followed by 5-7.5 microgram/kg/dose PO every 8 hours for 2 doses

Intravenous

7.5-12.5 microgram/kg/dose IV once followed by 3.75-6.25 microgram/kg/dose IV every 8 hours for 2 doses

Full Term Neonate

Oral

12.5-17.5 microgram/kg/dose PO once followed by 6.25-8.75 microgram/kg/dose PO every 8 hours for 2 doses

Intravenous

10-15 microgram/kg/dose IV once followed by 5-7.5 microgram/kg/dose IV every 8 hours for 2 doses

Maintenance

Premature Neonate

Oral

2.5-3.75 microgram/kg/dose PO every 12 hours

Intravenous

2-3 microgram/kg/dose IV every 12 hours

Full Term Neonate

Oral

3-5 microgram/kg/dose PO every 12 hours

Intravenous

2.5-4 microgram/kg/dose IV every 12 hours

Supplied: Injection: 250 micrograms/mL **HIGH ALERT**
Solution: 50 micrograms/mL
Tablet: 125 microgram(s)

digoxin immune fab (ovine)

Antidote

Go to Atlantic Canada Poison Centre Antidote Kit for information on antidote dosing and administration.

Supplied: Injection: 40 mg

DOBUTamine

- For administration guidelines outside of PICU or NICU, go to Policy 25.40 Inotrope Infusions on Cardiology Inpatient Unit

IV Continuous

Ordered as: ___microgram/kg/minute

Loading Dose

None

Initial Dosing

5 -10 microgram/kg/min

Suggested Titration

2.5 - 5 microgram/kg/min every 15 to 30 minutes; may titrate faster if clinically indicated

Usual Range
2.5 - 15 microgram/kg/min

Maximum: 20 microgram/kg/min
Supplied: Injection: 12.5 mg/mL

dolutegravir

Antiretroviral Agent

Consult Infectious Diseases for dosing

Supplied: Tablet: 50 mg
Tablet, Dispersible: 5 mg

domperidone

- Go to Health Canada warning (2015) Domperidone- Association with Serious Abnormal Heart Rhythms and Sudden Death (Cardiac Arrest)
- **Recommend ECG pre initiation and repeat 3-5 days post initiation of domperidone in all neonatal patients**

Renal Adjustment

GI motility

0.1-0.3 mg/kg/dose PO every 6 to 8 hours . Give 15-30 minutes before feeds/meals/bedtime (as applicable)
Comments
- Give 15-30 minutes before feeds

Supplied: Suspension: 1 mg/mL **IWK Compounded**
Tablet: 10 mg

DOPamine

IV Continuous

Ordered as: ___microgram/kg/minute

Loading Dose
None

Initial Dosing
5 -10 microgram/kg/min

Suggested Titration
2.5 - 5 microgram/kg/min every 15 to 30 minutes; may titrate faster if clinically indicated

Usual Range
2.5 - 15 microgram/kg/min

Maximum: 20 microgram/kg/min
Comments
Low dose (1 - 5 microgram/kg/min): dopaminergic receptor agonism
Intermediate dose (5 - 10 microgram/kg/min): beta-1 adrenergic receptor agonism
High dose (10 - 20 microgram/kg/min): alpha-1 adrenergic receptor agonism

Supplied: Injection: 1600 micrograms/mL, 3200 micrograms/mL

enalaprilat

Renal Adjustment

Hypertension

0.005-0.01 mg/kg/dose IV every 8 to 24 hours

Comments

- Premature infants may require extended dosing interval due to decreased renal function. The decreased elimination and extended duration of action, increases the risk of prolonged hypotension and acute renal failure

Supplied: Injection: 1.25 mg/mL

---

enoxaparin

- *June 2023 - Current product provided by IWK Pharmacy: Redesca®*

Dose Rounding Guidelines:

Note: these are guidelines only, and variations from this guidance may be warranted as is clinically appropriate.

Doses greater than 5 mg--> round to the nearest whole milligram.

Doses less than 5 mg--> round to the 0.5 mg increments as follows:

Total Calculated Dose (mg)	Dose to order (mg)
1 - 1.25	1
1.26 -1.74	1.5
1.75 - 2.25	2
2.26 - 2.74	2.5
2.75 - 3.25	3
3.26 - 3.74	3.5
3.75 - 4.25	4
4.26 - 4.74	4.5
4.75 - 5	5

Renal Adjustment

Venous Thromboembolism

Prophylaxis

Go to order set IWKPREN "Enoxaparin Prophylactic Orders"

Therapeutic

Initial Dosing

Go to order set IWKTHEN "Enoxaparin Therapeutic Orders"

Subsequent Dosing

Refer to page 2 of IWKTHEN (above) for information on monitoring and subsequent dosing

Supplied: Injection: 30 mg/0.3 mL (Prefilled Syringe), 40 mg/0.4 mL (Prefilled Syringe), 60 mg/0.6 mL (Prefilled Syringe), 80 mg/0.8 mL (Prefilled Syringe), 100 mg/mL (Prefilled Syringe), 100 mg/mL (3 mL Vial)

EPINEPHrine

Neonatal Resuscitation

Go to Neonatal Resuscitation Calculator

Severe bradycardia and hypotension

Intravenous

Intermittent

0.01-0.03 mg/kg/dose IV every 3 to 5 minutes

Continuous Infusion

Ordered as: ___microgram/kg/minute

Loading Dose

None

Initial Dosing

0.05 microgram/kg/min

Suggested Titration

0.01 microgram/kg/min every 15 to 30 minutes; may titrate faster if clinically indicated

Usual Range

0.05 - 0.5 microgram/kg/min

Maximum: 1 microgram/kg/min

ETT

0.1 mg/kg/dose ETT every 3 to 5 minutes
Maximum: 0.3 mg/dose

Inhalation ***Use 1 mg/mL ampoules***

0.5 mg/kg/dose inhalation every hour PRN Mix dose (as needed) with 0.9% sodium chloride to provide a total volume of 2.5 mL for nebulization
Maximum: 2.5 mg/dose
Supplied: Injection: 1 mg/mL (1 mL Ampoule) , 0.1 mg/mL (10 mL Prefilled Syringe) , 0.5 mg/mL (0.3 mL Auto-Injector) , 1 mg/mL (0.3 mL Auto-Injector) , 1 mg/mL (30 mL Vial)
Solution, Topical: 1 mg/mL

EPINEPHrine, Racemic - [Racemic EPINEPHrine]

- **Racemic EPINEPHrine is currently short from the manufacturer.**
  - **Go to IWK Drug Shortages page for more information on alternatives**
  - **See EPINEPHrine for information on dosing via inhalation:**
    - **Go to Neonatal**
    - **Go to Pediatrics**
    - **For information on the use of nebulized medications and COVID, click here**

Supplied: Inhalation, Nebule: 22.5 mg/mL

---

epoprostenol - [prostacyclin]

- **NOTE: 1 NANOgram = 0.001 microgram**

IV Continuous

Ordered as: ____NANOgram/kg/min

Loading Dose
None

Initial Dosing
1 NANOgram/kg/min

Suggested Titration
1-2 NANOgram/kg/min every 15-30 minutes

Usual Range
20-40 NANOgram/kg/min

Maximum
80 NANOgram/kg/min

Comments
Do not withdraw treatment abruptly. Decrease dose by 2 NANOgrams/kg/minute every 15 minutes

Supplied: Injection: 0.5 mg

erythromycin

- Go to Policy 10.35 Medical Directive for the Administration of Phytonadione (Vitamin K1) Intramuscular and Erythromycin Ophthalmic Ointment by Nurses at the IWK working in the Birth Unit and Neonatal Intensive Care Unit

Renal Adjustment

Ophthalmia neonatorum prophylaxis

Go to order set IWKADOR "NICU Admission Orders"

Go to order set IWKNEAD "Newborn Admission Orders"

Supplied: Injection: 1 gram(s)
Ointment, Ophthalmic: 0.5 %

esmolol

Supraventricular Tachycardia/Hypertension

IV Continuous

Ordered as: ____microgram/kg/min

Loading Dose
Not usually required

Initial Dosing
50-100 microgram/kg/min

Suggested Titration
25-50 microgram/kg/min every 5-20 minutes

Usual Range
300-500 microgram/kg/min

Maximum
1000 microgram/kg/min

Supplied: Injection: 10 mg/mL (10 mL Vial) , 10 mg/mL (250 mL Bag)

famotidine

Famotidine is associated with QT interval prolongation, caution with other drugs or conditions associated with QT interval prolongation.

GERD

Intravenous

0.25-0.5 mg/kg/dose IV every 24 hours
Supplied: Injection: 10 mg/mL
Suspension: 8 mg/mL **IWK Compounded**
Tablet: 20 mg

---

fat emulsion (Intralipid) - [Intralipid]

Go to IWK Compatibility Chart for:

- TPN
- SMOF Lipid
- Intralipid

Go to IWK Policy 30.70 "Parenteral Nutrition"

Do not use in patients with a history of severe egg, peanut or legume (soy bean) allergy

Go to Atlantic Canada Poison Centre Antidote Kit for information on antidote administration

---

Parenteral Nutrition

Go to Clinical Order Set IWK FALI "Fat/Lipid Emulsion Order"

Supplied: Injection: 0.2 gram/mL

---

fat emulsion (SMOF) - [SMOF]

Go to IWK Compatibility Chart for:

- TPN
- SMOF Lipid
- Intralipid

Go to IWK Policy 30.70 "Parenteral Nutrition"

Do not use in patients with a history of severe egg, peanut or legume (soy bean) or fish allergy

---

Parenteral Nutrition

Go to Clinical Order Set IWKFALI "Fat / Lipid Emulsion Orders"

Supplied: Injection: 0.2 gram/mL

---

fentaNYL

- **These dosing guidelines are intended for opioid-naive, acute pain situations.**
- **Practitioners should consider whether the patient is opioid naive and other underlying medical conditions when choosing an initial dose.**
- **The Children's Health Program is supported by an Acute Pain Service which is available for medical consultation in complex dosing situations.**
- **Patients already receiving regular opioids or with cancer or chronic pain may require significantly higher or more frequent doses.**

Renal Adjustment ☑

Analgesia/Sedation- Continuous Infusion

Ordered as: ___microgram/kg/hour

Loading Dose
1-2 microgram/kg IV x 1 PRN

Initial Dosing
1-2 microgram/kg/hour IV continuous

Suggested Titration
0.5-1 microgram/kg/hour every 1 to 4 hours PRN (titrated to effect)

Usual Range
1-4 microgram/kg/hour IV continuous

Maximum: 5 microgram/kg/hour

Sedation - Continuous Infusion in Congenital Diaphragmatic Hernia (CDH)

Ordered as: ___microgram/kg/hour

Initial Dosing
2 microgram/kg/hour IV continuous

Suggested Titration
0.5-1 microgram/kg/hour every 1 to 4 hours PRN (titrated to effect).
If inadequate sedation at 4 micrograms/kg/hour, add midazolam as second line agent.

Analgesia/Sedation- Intermittent

Ordered as : micrograms

0.5-3 microgram/kg/dose IV every 2 to 4 hours PRN . Note: Usually equal either to 1) the hourly rate or 2) half of the hourly rate if on continuous infusion

Pre-Intubation

Non-emergent

Go to clinical order set IWK NEINT Non-Emergent Intubation in NICU Pre-Medication Orders

Emergent

Go to Neonatal Resuscitation/Pre-Intubation Medications Calculator

Comments
Weaning Guidelines
Neonates treated with continuous infusion for 5 days or longer are more likely to develop narcotic withdrawal symptoms. Wean as below if on fentaNYL for:

- *5 days or less:* wean by 30-50% every 12 to 24 hours
- *6 to 10 days:* wean by 20% every 12 to 24 hours
- *Greater than 10 days*: wean by 10% every 24 hours

Guidelines for conversion of IV fentaNYL to oral morphine in neonates
Go to calculator for conversion of IV fentaNYL to oral morphine in neonates
Note: this provides a rough estimate for converting IV FentaNYL to PO morphine. There is significant individual response to various opioids as well as unpredictable or incomplete tolerance between opioids; clinical judgement must always be used when converting opioids. Neonates can be more susceptible to adverse effects of opioids therefore consider starting at a lower dose than what the conversion suggests.

- Calculate total micrograms/day of IV fentaNYL

- Divide by 1000 (converts micrograms to mg) *This is the mg/day of IV fentaNYL*
- Multiply by 50 (converts IV fentaNYL to PO morphine AND incorporates drug cross tolerance) *This is the mg/day of PO morphine*
- Divide mg/day of PO morphine by:
  - 8 for q3h dosing *This is the mg/dose at q3h dosing*
  - 6 for q4h dosing *This is the mg/dose at q4h dosing*
- Divide the mg/dose by the patient's weight (to obtain mg/kg/dose), then consider:
  - Does the dose make sense? How does it compare to the Neonatal and/or Pediatric morphine drug dosing guideline?
  - If concerned about treating pain in addition to withdrawal, a higher dose is usually required. If withdrawal is the only concern, consider starting at a lower dose.
- Consider ordering a PO morphine breakthrough dose (one half of the calculated maintenance dose)

Supplied: Injection: 50 micrograms/mL, 10 micrograms/mL **IWK Compounded**, 2 micrograms/mL **IWK Compounded**
Transdermal Patch: 25 micrograms/hour, 50 micrograms/hour, 75 micrograms/hour, 100 micrograms/hour

filgrastim - [G-CSF, Grastofil, Neupogen]

Current product selection: Nivestym (a biosimilar to Neupogen)

Go to IWK Chemotherapy Administration Standards document

Doses must be rounded as follows to allow for measurable doses

- less than 15 micrograms --> ordered in 1.5 micrograms increments (e.g 12 micrograms, 13.5 micrograms)
- greater than or equal to 15 micrograms---> ordered in 3 microgram increments (e.g. 18 micrograms, 21 micrograms)

Neutropenia with Sepsis

10 microgram/kg/dose IV/Subcutaneous daily for 3 days

Neutropenia, congential

5 microgram/kg/dose subcutaneous daily may increase to 10 micrograms/kg/dose once daily, if inadequate response
Supplied: Injection: 300 micrograms/mL, 600 micrograms/mL

fish oil emulsion - [Omegaven]

Parenteral Nutrition

Go to Clinical Order Set IWK FALI "Fat / Lipid Emulsion Orders"

Supplied: Injection: 0.1 gram/mL

flecainide

Antiarrhythmic

Go to Body Surface Area (BSA) Calculator

Initial: 16.7 mg/m^2/dose PO every 8 hours
Maximum: 200 mg/m*2/24h

or

Initial: 25 mg/m^2/dose PO every 12 hours
Maximum: 200 mg/m*2/24h
Comments

- Daily ECG for 3 days on initiation and then ECG with change of dose.
- In infants receiving milk or formula, avoid concurrent administration with feedings, milk may inhibit absorption.
- Target drug levels can be used to monitor flecainide for efficacy and toxicity although it is processed off site and turnaround time is 1 to 2 weeks
- Flecainide may increase serum drug levels of digoxin, when used in combination monitor closely.

Supplied: Suspension: 20 mg/mL **IWK Compounded**
Tablet: 50 mg, 100 mg

fluconazole

Renal Adjustment

Various Indications

Go to Firstline

Peritonitis

Intraperitoneally

Go to 2012 ISPD Consensus Guidelines for the Prevention and Treatment of Catheter-Related Infections an Peritonitis in Pediatrics Receiving PD

Comments

- Oral suspension may be administered with or without feedings.

Supplied: Injection: 2 mg/mL
Suspension: 10 mg/mL
Tablet: 50 mg, 100 mg

flumazenil

Antidote

Go to Atlantic Canada Poison Centre Antidote Kit for information on antidote dosing and administration.

Supplied: Injection: 0.1 mg/mL

furosemide

Diuretic

Intermittent

1 mg/kg/dose IV every 12 to 24 hours

1-2 mg/kg/dose PO every 12 to 24 hours

Continuous Infusion

Ordered as: ___mg/kg/hour

Loading Dose

None

Initial Dosing

0.1 mg/kg/hour

Suggested Titration

0.1 mg/kg/hour every 12 to 24 hours

Usual Range

0.1 - 0.4 mg/kg/hour

Maximum: 0.4 mg/kg/hour

Comments

Neonatal Family Resource: Furosemide Information Sheet

- Use cautiously in jaundiced newborn.
- May cause persistent PDA if given in first week of life.
- Prolonged use in premature infants may result in nephrocalcinosis. Consider alternate day therapy for long term use

- Oral absorption can be erratic and incomplete.

Supplied: Injection: 10 mg/mL
Solution: 10 mg/mL
Tablet: 20 mg

---

fusidic acid - [Fucidin]

Topical (cream or ointment)

Manufacturer recommended

Topically to affected area three to four times daily
Supplied: Cream, Topical: 2 %
Ointment, Topical: 2 %

---

ganciclovir

- Only use IV therapy until oral treatment with valGANciclovir is possible. Go to Valganciclovir

Renal Adjustment

Congenital Cytomegalovirus, Treatment

6 mg/kg/dose IV every 12 hours
Comments

- Monitor
  - CBC with differential. May require dose reduction or discontinuation
  - liver function tests and bilirubin

Supplied: Injection: 500 mg

---

gentamicin

Renal Adjustment

Extended Interval Dosing

Initial

*Preferred dosing in the the context of normal renal function for treatment of gram negative infections. Do **NOT** use extended interval dosing for synergy in gram positive infections.*

Go to Firstline

Subsequent Dosing/Monitoring

Check gentamicin level at 22 hours post start of infusion, regardless of the dosing interval that the patient is started on for all patients with an anticipated gentamicin treatment greater than 48 hours.
For patients less than or equal to 7 days of age in whom anticipated gentamicin treatment duration is less than or equal to 48 hours (i.e. clinical suspicion for early-onset sepsis is low), only order 22 hour gentamicin level if any or the following criteria apply:

- **urine output less than 1 mL/kg/h or a serum creatinine greater than or equal to 120 umol/L**
- **hypoxic ischemic encephalopathy**
- **concurrent ibuprofen/indomethacin administration**
- **concurrent furosemide, vancomycin, vasopressor, or inotrope administration**
- **severe cardiac anomalies**
- **less than or equal to 29 weeks gestation or less than 1.5 kg birth weight**

Adjust dosing interval based on the 22-hour level drawn with the first dose by referring to the information below or in discussion with the pharmacist.

- **If 22 h level is: 1.2 microgram/mL or less: give dose every 24h**
- **1.3 to 2.6 microgram/mL: give dose every 36h**

- **2.7 to 3.5 microgram/mL: give dose every 48h**
- **3.6 microgram/mL or more: Hold next dose, repeat gent renal* level in 24 hours and consult pharmacy for guidance. *Gentamicin may be given once the level is less than 2 mcg/mL. Base the dosing interval on the time to achieve a level less than 2 mcg/mL. To ensure the dosing interval is appropriate, a 22 hour level may be repeated post second dose. For additional dosing assistance, consult pharmacy for guidance.**

If levels are within target range continue current dosing regimen. Repeat 22 hour level every 7 days or sooner if clinically necessary.
Peak levels are not routinely measured but may be ordered if severe gram negative infection or concern about clinical progress.

Peritonitis

Intraperitoneally

Go to 2012 ISPD Consensus Guidelines for the Prevention and Treatment of Catheter-Related Infections an Peritonitis in Pediatrics Receiving PD

Supplied: Injection: 1 mg/mL, 40 mg/mL

glucagon

NOTE: 1000 micrograms = 1 mg = 1 unit

Hypoglycemia

20-30 microgram/kg/dose IV/IM/Subcutaneous May repeat in 15 minutes PRN

Endogenous Hyperinsulinism or Refractory Hypoglycemia

IV Continuous

Ordered as: ____microgram/kg/hour

Loading Dose
None

Initial Dosing
10 microgram/kg/hour

Suggested Titration
1 microgram/kg/hour every 1-2 hours

Usual Range
10-15 microgram/kg/hour

Maximum
20 microgram/kg/hour **OR**
1500 micrograms/24 hours

Supplied: Injection: 1 mg

glycerin

Tip of adult suppository PR daily PRN
Supplied: Suppository: 1.8 gram/suppository, 2.34 gram/suppository

glycopyrrolate

Note: 1 microgram = 0.001 mg

Renal Adjustment

Reduction of respiratory and salivary secretions

Parenteral

2-4 microgram/kg/dose IV every 6 to 8 hours . Titrate to desired clinical effect up to 10 micrograms/kg/dose every 8 hours

Oral

20-40 microgram/kg/dose PO every 8 to 12 hours . Titrate to desired clinical effect up to 100 micrograms/kg/dose every 8 hours

Comments

- There is limited evidence supporting use in this age group
- Injection may be given orally

Supplied: Injection: 0.2 mg/mL, 200 micrograms/mL
Suspension: 0.5 mg/mL **IWK Compounded**

---

heparin

CVAD Patency

Go to Policy 735 "Central Venous Access Device (CVAD) Care & Maintenance" for more information

Go to Clinical Order Set IWK_HELO "CVAD Heparin Locking Pediatric and Neonatal"

Systemic Anticoagulant, Therapeutic

Go to clinical order set IWK THUN "Therapeutic Unfractionated Heparin Infusion Orders Neonatal & Pediatric High Alert"

Supplied: Injection: 10000 units/mL, 50 units/mL in D5W, 2 units/mL, 10 units/mL, 100 units/mL, 1000 units/mL

---

hepatitis B vaccine - [Recombivax]

Go to IWK_Policy 80.28 "Newborn Hepatitis B Immune Globulin & Vaccine Prophylaxis Schedule" for more information

Go to clinical order set IWK HEIM "HEPATITIS B (HB) IMMUNIZATION ORDERS"

Go to Health Canada "Canadian Immunization Guidelines"

Supplied: Injection: 20 micrograms/mL

---

hyaluronidase

Management of Extravasation

Most effective if used within 1 hour of injury; may be used up to 12 hours after injury. Duration of action is 24-48 hours

Go to Medication Management Policy 30.60 "Management of Extravasation" for more information *policy under review*
5 x 30 unit (0.2 mL) subcutaneous injections around the circumference of infiltrate (one injection may be given via interstitial cannula if remains in situ)
Supplied: Injection: 150 units

---

hydrALAZINE

Renal Adjustment

Hypertension

Oral

0.25-1 mg/kg/dose PO every 6 to 8 hours
Maximum: 7.5 mg/kg/24h

Intravenous

0.1-0.5 mg/kg/dose IV every 6 to 8 hours - Dose may be titrated up to:
Maximum: 2 mg/kg/dose
Comments

- Give oral suspension with feeds to enhance absorption.

Supplied: Injection: 20 mg/mL **HIGH ALERT**
Suspension: 1 mg/mL **IWK Compounded**
Tablet: 10 mg, 25 mg

hydrochlorothiazide

Renal Adjustment

Diuretic

1-2 mg/kg/dose PO BID
Comments
Neonatal Family Resource: Hydrochlorothiazide Information Sheet

Supplied: Suspension: 5 mg/mL **IWK Compounded**
Tablet: 25 mg

hydrocortisone

Congenital Adrenal Hyperplasia

Go Body Surface Area Calculator
3.3-5 mg/m^2/dose PO every 8 hours

Physiologic Replacement

Go to Body Surface Area Calculator
3-5 mg/m^2/dose PO BID

or

2-3.3 mg/m^2/dose PO TID

Moderate Stress Dosing

Go to Body Surface Area Calculator
10 mg/m^2/dose PO TID Reassess after 3 days

Severe Stress Dosing or Surgery

Go to Body Surface Area Calculator
100 mg/m^2/dose IV once followed by 16.6-33.3 mg/m2/dose every 8 hours for 1-2 days then reassess

Hypoglycemia
(Refractory to glucose infusion of more than 12-15 mg/kg/minute)

2.5 mg/kg/dose IV/PO every 12 hours

or

1.7 mg/kg/dose IV/PO every 8 hours

Vasopressor Resistant Hypotension

1 mg/kg/dose IV every 8 hours . May increase to every 6 hours if inadequate response. In consultation with neonatologist, dose may increase to
Maximum: 2 mg/kg/dose

Prevention of Bronchopulmonary Dysplasia in Extremely Low Birth Weight Infants

Gestational age less than 28 weeks AND less than or equal to 48 hours old

0.5 mg/kg/dose IV every 12 hours for 7 days, then 0.5 mg/kg/dose IV once daily for 3 days

Comments

- Concurrent use of ibuprofen or other NSAIDs may increase risk of GI side effects including GI perforation and should be avoided
- Therapy of more than a few days should be decreased gradually
- Refer to Comparative Dosage Table: Corticosteroids Properties and Potencies

Supplied: Cream, Topical: 0.5 %, 1 %
Injection: 100 mg, 250 mg, 500 mg
Ointment, Topical: 0.5 %, 1 %
Suspension: 1 mg/mL **IWK Compounded**
Tablet: 10 mg

HYDROmorphone

- **These dosing guidelines for HYDROmorphone are intended for opioid-naive, acute pain situations.**
- **Practitioners should consider whether the patient is opioid-naive and other underlying medical conditions when choosing an initial dose.**
- **The Children's Health Program is supported by an Acute Pain Service which is available for medical consultation in complex dosing situations.**
- **Patients already receiving regular opioids or with cancer or chronic pain may require significantly higher or more frequent doses.**

***NEW concentration February 14,2023:** ALL pediatric care areas will now stock **HYDROmorphone 1 mg/mL vials** for intermittent use

Renal Adjustment ☑

IV Continuous

Limited data in neonates. Usually only ordered for patients transferred from PICU to NICU or in clinical scenarios where other opioids are ineffective. Consult NICU or PICU Pharmacist for further guidance on dosing if needed.

Comments
Weaning Guidelines
Neonates treated with continuous infusion for 5 days or longer are more likely to develop narcotic withdrawal symptoms. Suggested wean as follows for HYDROmorphone duration of:

- 5 days or less: Wean by 30-50% every 12 to 24 hours
- 6 to 10 days: Wean by 20% every 12 to 24 hours
- Greater than 10 days: Wean by 10% every 24 hours

Supplied: Capsule, Controlled Release: 3 mg
Injection: 1 mg/mL, 2 mg/mL, 10 mg/mL, 0.2 mg/mL (50 mL Prefilled Syringe) **IWK Compounded**, 0.2 mg/mL (100 mL Bag) **IWK Compounded**, 0.05 mg/mL (25 mL Syringe) **IWK Compounded**
Liquid: 1 mg/mL
Tablet: 1 mg, 2 mg, 4 mg

ibuprofen - [Advil, Motrin, NeoProfen]

November 2022: For printable patient information on managing pediatric pain and fever at home during ibuprofen shortage please click here

Refer to 6 Steps to Succuss in Pill Swallowing and Tips on Success in Pill Swallowing to support patients during the shortage.

- **Selection of oral route to be discussed with neonatalogist prior to treatment- using the oral route may have advantages compared to IV route (efficacy and NEC prevention).**
- **Encourage discussion regarding preferred route.**
- **The dosing guidelines below are based on the use of ibuprofen lysine (NeoProfen)**

Renal Adjustment ☑

Patent Ductus Arteriosus (PDA) Closure

Go to clinical order set IWK PDA "Patent Ductus Arteriosus (PDA) Pharmacological Treatment in NICU"

Comments

- A second course of 3 doses may be considered if PDA does not close 48 hours after the last dose or if it re-opens.
- May displace bilirubin from albumin binding sites, increasing the risk of bilirubin encephalopathy in premature neonates. Use with caution in neonates with hyperbilirubinemia
- Contact physician if urinary output is less than 0.6 mL/kg/**hr**

Supplied: Injection: 10 mg/mL **Special Access**
Suspension: 20 mg/mL
Tablet: 200 mg

indomethacin

Renal Adjustment

Prevention of Intraventricular Hemorrhage

Start 6 to 12 hours after birth

0.1 mg/kg/dose IV every 24 hours for 3 doses

Patent Ductus Arteriosis (PDA) Closure

Post natal age less than 2 days

1st Dose

0.2 mg/kg/dose IV every 12 to 24 hours see comment section below for interval determination criteria

2nd and 3rd Dose (begin 12-24 hours after 1st dose)

0.1 mg/kg/dose IV every 12 to 24 hours see comment section below for interval determination criteria

Post natal age 2 to 7 days

1st, 2nd and 3rd Doses

0.2 mg/kg/dose IV every 12 to 24 hours see comment section below for interval determination criteria

Post natal age greater than 7 days

1st Dose

0.2 mg/kg/dose IV every 12 to 24 hours see comment section below for interval determination criteria

2nd and 3rd Dose (begin 12-24 hours after 1st dose)

0.25 mg/kg/dose IV every 12 to 24 hours see comment section below for interval determination criteria

Comments

- **Patent Ductus Arteriosis (PDA) Closure criteria:**
  - Doses given IV at 12-24 h intervals
    12 hour interval: Urine output greater than 1 mL/kg/**hour** after previous dose.
    24 hour interval: Urine output less than 1 mL/kg/**hour** after previous dose.
  - HOLD the next dose if urine output less than 0.6 mL/kg/**hour** or anuria.
  - Usually 3 doses/course. Maximum 2 courses

Supplied: Capsule: 25 mg
Injection: 1 mg **Special Access**
Suppository: 100 mg
Suspension: 5 mg/mL **IWK Compounded**

insulin, human regular - [Humulin R]

Renal Adjustment

Go to IWK Insulin Equivalencies

Current IWK product selection:

- Humulin R (100 unit/mL)

Go to Insulin Products Available in Canada

Info on various insulins including availability, administration, mixing information, onset/duration etc

Hyperglycemia

Go to clinical order set IWK HYINIV "Insulin Intravenous Infusion for Hyperglycemia in NICU Patients"

Hyperkalemia

0.1-0.2 unit(s)/kg/hour IV continuous infusion

For hyperkalemia, Dextrose 5% (D5W) or other dextrose containing solution must also be ordered separately and run concomitantly at 0.5 grams/kg/h (or 8.3 mg/kg/min) as continuous IV infusion. Titrate insulin and dextrose based on serum glucose and potassium.

Supplied: Injection: 100 units/mL (3 mL Vial) , 100 units/mL (3 mL Prefilled Disposable Pen)

iron (oral) - [ferrous salts]

- **All doses expressed in terms of elemental iron. All orders must be written in terms of elemental iron.**
- **Doses are a reflection of the total daily intake – consider iron content of oral feeds if receiving**

- Separate administration by at least 2 hours from phosphate or calcium containing supplements.

Prophylaxis

Indicated for infants born less than 37 weeks. Start when older than 14 days, or when close to full feeds and continue until 12 months corrected gestational age

Fed with human milk

Birth weight less than or equal to 1 kg

3-4 mg/kg/dose PO daily
Maximum: 15 mg/dose

Birth weight 1.01 to 1.5 kg

2-3 mg/kg/dose PO daily
Maximum: 15 mg/dose

Birth weight greater than 1.5 kg

2 mg/kg/dose PO daily
Maximum: 15 mg/dose

Fed with formula

Birth weight less than or equal to 1 kg

2 mg/kg/dose PO daily
Maximum: 15 mg/dose

Birth weight 1.01 to 1.5 kg

1 mg/kg/dose PO daily
Maximum: 15 mg/dose

Iron Deficiency Anemia

Treatment

2-3 mg/kg/dose PO BID

or

4-6 mg/kg/dose PO daily

If on Erythropoeitin Treatment

3 mg/kg/dose PO BID
Maximum: 12 mg/kg/24h

or

6 mg/kg/dose PO daily
Maximum: 12 mg/kg/24h
Comments
Neonatal Family Resource: Iron/Ferrous Sulfate Information Sheet

Supplied: Drops (as ferrous sulfate): 15 mg (as elemental)/mL
Tablet (as ferrous gluconate): 35 mg (as elemental)
Tablet (as ferrous sulfate): 60 mg (as elemental)

ivabradine

Although weight based dosing is provided below:

- **Calculated doses less than 1.25 mg must be rounded to increments of 0.15 mg (e.g. 0.15, 0.3, 0.45 mg, etc.)**
- **Calculated doses greater than 1.25 mg must be rounded to increments of 1.25 mg (e.g. 1.25, 2.5, 3.75 mg, etc.)**

Junctional Ectopic Tachycardia

Initial

0.025-0.05 mg/kg/dose PO BID
Maximum: 5 mg/INITIAL dose

Subsequent
Doses can be titrated to a maximum of 0.2 mg/kg/dose

Supplied: Powder papers: 0.15 mg **IWK Compounded**
Tablet: 5 mg

ketamine

Consult Pain Team for use in Neonates

Supplied: Injection: 10 mg/mL, 50 mg/mL

lamiVUDine

Go to Perinatal HIV Transmission Prophylaxis Clinical Practice Guideline 80.26

Perinatal HIV Transmission Prophylaxis

Go to order set IWK HIVINF "HIV Infant Orders"

Comments
Neonatal Family Resource: Lamivudine Information Sheet

Supplied: Solution: 10 mg/mL

lansoprazole

0.5-1.66 mg/kg/dose PO daily

or

0.25-0.83 mg/kg/dose PO BID

Comments

Prevacid FasTab® **cannot** be split: tablets are not scored and dose is not distributed evenly through the tablet.

Neonatal Family Resource: Lansoprazole Information Sheet

Supplied: Capsule, Delayed Release: 15 mg, 30 mg
Suspension: 3 mg/mL **IWK Compounded**
Tablet, Disintegrating Delayed Release (FasTab): 15 mg, 30 mg

---

levetiracetam - [Keppra]

When switching between oral and IV formulations, the total daily dose should be the same.

Renal Adjustment

Refractory Status Epilepticus

Loading Dose

Consider lower dose if already receiving oral levetiracetam as to not exceed the maximum daily dose (below).

60 mg/kg/dose IV once

Anticonvulsant

Maintenance

Initial

10 mg/kg/dose PO/IV BID

Titrated as needed to a usual range of:

10-30 mg/kg/dose PO/IV BID
Maximum: 60 mg/kg/24 hours
Supplied: Injection: 100 mg/mL
Solution: 100 mg/mL
Tablet: 250 mg, 500 mg

---

levocarnitine

Renal Adjustment

*Carnitine Deficiency**

Oral

6.25-12.5 mg/kg/dose PO every 3 hours
Maximum: 400 mg/kg/24h

Intravenous

6.25-12.5 mg/kg/dose IV every 3 hours

Parenteral Nutrition Supplement

Initial

2-5 mg/kg/24h **divided** IV - Dose may be titrated up to:
Maximum: 20 mg/kg/24h
Comments

- **For Carnitine Deficiency*** - may adjust frequency to every 4-6 hours based on feeds and/or in preparation for discharge. Discuss frequency of administration with the endocrine team.

Supplied: Injection: 200 mg/mL
Solution: 100 mg/mL
Tablet: 330 mg

levothyroxine

- **Round dose upward to the nearest tablet or portion of tablet.**
- **For oral administration, use tablet or part tablet and dissolve with a small amount of sterile water, breast milk or non-soy formula. Use immediately**

10-15 microgram/kg/dose PO daily
Comments

- Iron, calcium and soybean based formulas can decrease absorption
- For oral administration, use tablet or part tablet and dissolve with a small amount of sterile water, breast milk or non-soy formula. Use immediately.

Supplied: Injection: 40 micrograms/mL
Tablet: 25 microgram(s), 75 microgram(s), 88 microgram(s), 100 microgram(s), 112 microgram(s)

lidocaine|prilocaine - [EMLA]

Go to Medication Management Policy 20.77 - Application of Topical Anesthetics

Less than 28 weeks corrected gestational age

A dime sized area over the injection site for up to an hour prior to procedure
Maximum: 1 application/24 hours **AND** 1 hour application time 1

28 to 32 weeks corrected gestational age

A nickel sized area over the injection site for up to an hour prior to procedure
Maximum: 1 application/24 hours **AND** 1 hour application time 1

32 to 36 weeks corrected gestational age

A quarter to loonie sized area over the injection site for up to an hour prior to procedure
Maximum: 1 application/24 hours **AND** 1 hour application time 1

Greater than 37 weeks to 3 months OR Less than 5 kg

No more than 1 gram (marble sized amount spread to size of loonie) over the injection site for up to an hour prior to procedure
Maximum: 1 application/24 hours **AND** 1 hour application time 1
Comments
Family Resource: Numbing Cream: Topical Anesthetic

Supplied: Cream, Topical: 2.5|2.5 %

LORazepam

Intramuscular OLANZapine and any benzodiazepine should not be given concurrently due to severe drug interactions however if deemed absolutely clinically necessary. **Space intramuscular OLANZapine and intramuscular LORazepam by at least 2 hours.**

Renal Adjustment

Anticonvulsant

Intravenous

0.05-0.1 mg/kg/dose IV once and may repeat 0.05 mg/kg/dose in 10 to 15 minutes as needed.
Supplied: Injection: 4 mg/mL
Tablet, Sublingual: 0.5 mg, 1 mg

magnesium sulfate

- **All doses expressed in terms of mg of magnesium sulfate. All orders must be written in terms of mg of magnesium sulfate**
- **1 gram magesium sulfate = 8.12 mEq elemental magnesium = 98.6 mg elemental magnesium.**

Renal Adjustment ☑

Hypomagnesemia

25-50 mg/kg/dose IV every 8 to 12 hours

Severe Hypomagnesemia

50-100 mg/kg/dose IV once May repeat in 6 to 12 hours PRN

Persistent Pulmonary Hypertension of the Newborn (limited evidence):

Loading Dose

200 mg/kg/dose IV once

Maintenance

Continuous Infusion

20-75 mg/kg/hour IV continuous infusion

Supplied: Injection: 40 mg/mL (100 mL Bag) **IWK Compounded**, 40 mg/mL (500 mL Bag) **IWK Compounded**, 200 mg/mL

---

meropenem

Renal Adjustment ☑

Various Indications

Go to Firstline

Supplied: Injection: 1 gram(s)

---

methylene blue

Antidote

Go to Atlantic Canada Poison Centre Antidote Kit for information on antidote dosing and administration.

Supplied: Injection: 10 mg/mL

---

metroNIDAZOLE - [Flagyl]

Renal Adjustment ☑

Various Indications

Go to Firstline

Supplied: Cream, Vaginal: 10 %
Injection: 5 mg/mL
Suspension: 50 mg/mL **IWK Compounded**
Tablet: 250 mg

---

midazolam

Renal Adjustment ☑

Procedural Sedation*

Oral or intranasal midazolam in neonates is restricted to NICU, PICU, ED, OR. Use outside these settings must be in consultation with pediatric anesthesia. Go to IWK Policy 50002 "Sedation Outside of the Pediatric Operating Room, excluding PICU, NICU and the Emergency" for more information

Oral

0.25 mg/kg/dose PO once

Intranasal

Go to IWK Policy 20.11 "Administration of Intranasal Medications via a Mucosal Atomization Device (MAD)" for more information
0.2-0.3 mg/kg/dose intranasal once
Maximum: 5 mg/dose **AND** 2.5 mg/nostril 2.5

Sedation/Mechanical Ventilation

Intermittent

0.05-0.15 mg/kg/dose IV/IM every 2 to 4 hours PRN

Continuous IV Infusion

Ordered as: ___mg/kg/hour

Loading Dose
None

Initial Dosing
Less than or equal to 32 weeks: 0.06 mg/kg/hour for 24 hours, then decrease to 0.03 mg/kg/hour

Greater than 32 weeks: 0.06 mg/kg/hour

Suggested Titration
0.01-0.02 mg/kg/hour every 30 to 60 minutes

Usual Range
0.03-0.4 mg/kg/hour

Maximum: 1.4 mg/kg/hour

Refractory Status Epilepticus

Continuous IV Infusion

Ordered as: __mg/kg/hour

Loading Dose
0.15 mg/kg/dose

Initial Dosing
0.06 mg/kg/hour

Suggested Titration
0.03-0.06 mg/kg/hour every 10 minutes

Usual Range
0.06-0.4 mg/kg/hour

Maximum: 1.4 mg/kg/hour

Buccal

0.3 mg/kg/dose

End of Life Care

Newborns within the Women's & Newborn Health Programs

Go to Policy 4.45 End of Life Care for Newborns within the Women's & Newborn Health Program Policy

Go to clinical order set IWK ENLICA "End of Life Care for Newborns"

Comments

Weaning Guidelines

- IV infusion for 5 days or less, wean by 30-50% every 12 to 24 hours
- IV infusion for 6 to 10 days, wean by 20% every 12 to 24 hours
- IV infusion greater than 10 days, wean by 10% every 24 hours

***Onset of effects**

Route	*Time to Onset*
IV	2 to 3 minutes
PO	15 to 30 minutes
Intranasal	10 minutes

Usual duration of sedation after a single dose: 30 to 60 minutes

Supplied: Injection: 1 mg/mL (10 mL Vial) , 5 mg/mL (restricted to oral, buccal and intranasal routes of admin), 1 mg/mL (100 mL Bag) , 1 mg/mL (2 mL Vial)

milrinone

- For administration guidelines outside of PICU or NICU, go to Policy 25.40 Inotrope Infusions on Cardiology Inpatient Unit

Limited Evidence, optimal dosing not established

Renal Adjustment

IV Continuous

Ordered as: ___microgram/kg/minute

Loading Dose

Optional, usually not required
50 - 75 microgram/kg/dose x 1

Initial Dosing

0.25 microgram/kg/min

Suggested Titration

0.25 microgram/kg/min as required

Usual Range

0.25 - 0.75 microgram/kg/min

Maximum: 1 microgram/kg/min
Supplied: Injection: 1 mg/mL

morphine

- **These dosing guidelines are intended for opioid-naive, acute pain situations.**
- **Practitioners should consider whether the patient is opioid naive and other underlying medical conditions when choosing an initial dose.**
- **The Children's Health Program is supported by an Acute Pain Service which is available for medical consultation in complex dosing situations.**
- **Patients already receiving regular opioids or with cancer or chronic pain may require significantly higher or more frequent doses.**

- **Converting from ORAL dose to IV dose: divide oral dose by 3**
  Converting from IV dose to ORAL dose: multiply IV dose by 3

Renal Adjustment

Neonatal Abstinence Syndrome - Eat, Sleep, Console

Initial and titration

Go to clinical order set IWK MANAS "Management of Neonatal Abstinence Syndrome"

Weaning

Go to clinical order set IWK WENAS "Weaning Opioids in the Medical Management of Neonatal Abstinence Syndrome"

Analgesia/Sedation

IV Continuous

Ordered as: ___mg/kg/hour

Loading dose

0.05-0.1 mg/kg/dose IV

Initial Dosing

0.01-0.02 mg/kg/hour IV continuous

Suggested Titration

0.01 mg/kg/hour every 2 to 4 hours

Usual Range

0.01-0.02 mg/kg/hour IV continuous

Usual* Maximum:

0.04 mg/kg/hour *May require higher doses for sedation or if switching between opioids (e.g. converting from fentaNYL to morphine)

Intermittent - Parenteral

Usual Initial Dose

0.05 mg/kg/dose IV/IM/Subcutaneous every 4 to 6 hours PRN

Usual Range

0.05-0.1 mg/kg/dose IV/IM/Subcutaneous every 4 to 6 hours PRN

Usual Maximum: 0.2 mg/kg/dose

Intermittent - Oral

Usual Initial Dose

0.08 mg/kg/dose PO every 3 to 4 hours PRN

Usual Range

0.08-0.2 mg/kg/dose PO every 3 to 4 hours PRN

Usual* Maximum: 0.3 mg/kg/dose

*May require higher doses if switching between from IV to PO opioids (i.e. converting from IV fentanyl to PO morphine)

End of Life Care

Newborns within the Women's & Newborn Health Programs

Go to Policy 4.45 End of Life Care for Newborns within the Women's & Newborn Health Program Policy

Go to clinical order set IWK ENLICA "End of Life Care for Newborns"

Comments

Weaning Guidelines

Neonates treated with continuous infusion for 5 days or longer are more likely to develop opioid withdrawal symptoms. Suggested wean as follows for morphine duration of:

- 5 days or less: Wean by 30-50% every 12 to 24 hours
- 6 to 10 days: Wean by 20% every 12 to 24 hours
- Greater than 10 days: Wean by 10 % every 24 hours

Guidelines for conversion to oral morphine from IV Fentanyl in neonates

Go to calculator for conversion of IV fentaNYL to oral morphine in neonates

Note: this provides a rough estimate for converting IV FentaNYL to PO morphine. There is significant individual response to various opioids as well as unpredictable or incomplete tolerance between opioids; clinical judgement must always be used when converting opioids. Neonates can be more susceptible to adverse effects of opioids therefore consider starting at a lower dose than what the conversion suggests.

For detailed, step by step instructions on converting to oral morphine from IV fentaNYL, please see the fentaNYL drug dosing guideline.

Supplied: Capsule, Extended Release: 10 mg, 15 mg, 30 mg
Injection: 1 mg/mL (50 mL Prefilled Syringe) **IWK Compounded**, 1 mg/mL (100 mL Bag) , 2 mg/mL, 10 mg/mL, 0.5 mg/mL
Syrup: 1 mg/mL
Tablet: 5 mg

moxifloxacin

Manufacturer recommended

1 drops in affected eye(s) TID to QID
Supplied: Drops, Ophthalmic: 0.5 %

naloxone

The duration of action of some opioids may exceed that of naloxone, therefore repeat doses may be required. Monitor patient closely.

Antidote

Go to Atlantic Canada Poison Centre Antidote Kit for information on antidote dosing.

Opioid Intoxication

0.1 mg/kg/dose IV/IM every 2-3 minutes as needed
Comments

- Abrupt reversal of opioid depression may result in symptoms of withdrawal in neonates of opioid-dependant mothers

Supplied: Injection: 0.4 mg/mL

neostigmine

Renal Adjustment

Reversal of Neuromuscular Blockade

0.03-0.07 mg/kg/dose IV
Maximum: 0.07 mg/kg TOTAL DOSE **OR** 5 mg TOTAL DOSE 5
Comments

- Atropine or glycopyrrolate should be given prior to or with neostigmine.

Supplied: Injection: 0.5 mg/mL, 1 mg/mL

nevirapine

Go to Perinatal HIV Transmission Prophylaxis Clinical Practice Guideline 80.26

Perinatal HIV Transmission Prophylaxis

Go to order set IWK HIVINF "HIV Infant / Newborn Orders For infants born to a person living with HIV or unknown HIV status with risk factors"

Comments
Neonatal Family Resource: Nevirapine Information Sheet

Supplied: Suspension: 10 mg/mL **Special Access**
Tablet: 200 mg

---

nitroprusside

IV Continuous
Ordered as: ____microgram/kg/min

Loading Dose
None

Initial Dosing
0.2 microgram/kg/min

Suggested Titration
0.1-0.2 microgram/kg/min every 10 minutes

Usual Range
0.5-2 microgram/kg/min

Maximum
10 microgram/kg/min

Comments
- **Maximum:** 4 micrograms/kg/minute if use exceeds 24 hours.
- Infusion should be discontinued if blood pressure not adequately controlled within 10 minutes at a maximum dose of 10 microgram/kg/min

Supplied: Injection: 25 mg/mL

---

norepinephrine

- **All doses expressed in terms of norepinephrine base**

Continuous Infusion

Ordered as: ____microgram/kg/minute

Loading Dose
None

Initial Dosing
0.05 microgram/kg/min

Suggested Titration
0.01 microgram/kg/min every 10 to 30 minutes

Usual Range
0.1 - 0.5 microgram/kg/min

Maximum: 2 microgram/kg/min
Supplied: Injection: 1 mg/mL

nystatin

January 2020- Nystatin in cream and ointment form are no longer on IWK Formulary (click here for memo or click here for alternatives)

Oral candidiasis

Prophylaxis in VLBW infants (less than 1 kg)

Start on day 3 of life

100,000 unit(s) by mouth swab and NG/OG every 8 hours until 6 weeks of age

Treatment

Preterm

100,000 unit(s) PO every 6 hours for 7-10 days or until control is achieved

Term

200,000 unit(s) PO every 6 hours for 7-10 days or until control is achieved

Comments

- Divide dose and administer to each side of mouth. Avoid feeding for 5 minutes or administer after feeds
- Continue treatment for 3 days after symptoms have resolved

Supplied: Suspension: 100000 units/mL

octreotide

- **Due to high incidence of NEC when used in premature neonates and questionable benefit, should not be used as initial management and if possible, avoid use completely.**

Renal Adjustment

Chylothorax

IV continuous

Ordered as: ____microgram/kg/hour

Loading Dose

None

Initial Dosing

0.5 – 1 microgram/kg/hour

Suggested Titration

0.5 – 1 microgram/kg/hour every 24 hours

Usual Range

0.5 – 4 microgram/kg/hour

Maximum

10 microgram/kg/hour **OR**

50 microgram/hour

Hyperinsulinemia Hypoglycemia (not 1st line)

1 microgram/kg/dose IV every 6 hours titrate to desired clinical effect
Maximum: 10 microgram/kg/dose
Comments

- Decrease infusion gradually over 2-7 days

Supplied: Injection: 100 micrograms/mL, 500 micrograms/mL

oseltamivir - [Tamiflu]

Renal Adjustment

Influenza

Treatment/Prophylaxis

Go to Firstline

Supplied: Capsule: 75 mg, 45 mg, 30 mg
Suspension: 6 mg/mL

---

palivizumab - [Synagis]

Go to IWK Policy 10.37 "Care Directive for the Administration of Palivizumab (Synagis®) Intramuscular by Registered Nurses at the IWK Working in the RSV Prevention Clinic"

Go to IWK External Website "About Palivizumab" for more information

Go to NACI Statement "Recommended use of Palivizumab to Reduce Complications of RSV Infection in Infants"

RSV Prophylaxis

First dose should be administered just prior to the start of RSV season where possible

Remaining doses should be administered monthly thereafter for up to 5 doses total.

Go to clinical order set IWK PALIV "Palivizumab for RSV Prophylaxis NICU"

Supplied: Injection: 50 mg, 100 mg

---

pantoprazole

- IV therapy should be discontinued as soon as patient tolerates oral therapy.
- **Limited data available as increased risk for infections, necrotizing enterocolitis**
- **In neonates may consider using for diagnosis including: ENT anomalies, congenital lung anomalies, congenital heart disease, congenital diaphragmatic hernia, gastroschiesis**

Renal Adjustment

1.2 mg/kg/dose IV daily
Maximum: 2.5 mg/dose
Supplied: Injection: 40 mg

---

penicillin G

- 0.1 million units= 0.1 MU (note : displayed in infusion pumps as MU)= 100,000 units/mL

Renal Adjustment

Various Indications

Go to Firstline

Supplied: Injection: 1 million units (MU), 5 million units (MU)

PHENobarbital

Renal Adjustment

Anticonvulsant

Loading Dose

15-20 mg/kg/dose IV . May give additions dose(s) of 5 mg/kg/dose every 15-30 minutes until seizures cease or maximum total loading dose is reached
Maximum: 40 mg/kg TOTAL DOSE

Maintenance

Start 12-24 hours after loading dose

3-5 mg/kg/dose IV/PO every 24 hours

or

1.5-2.5 mg/kg/dose IV/PO every 12 hours

Neonatal Abstinence Syndrome (NAS)

Loading Dose

10 mg/kg/dose PO every 12 hours for 2 doses

Maintenance Dose

5 mg/kg/dose PO at bedtime or if excessive sedation: 2.5 mg/kg/dose PO q12h

Wean

Once morphine has been weaned to 0.04 mg/kg/dose, maintain morphine dose.
Discontinue PHENobarbital and monitor for 48 hours.
Continue morphine weaning guidelines if Finnegan scores remain stable

OR

With long term PHENobarbital use:
Once morphine dose has been weaned to 50% of the highest dose, decrease PHENobarbital to 2.5 mg/kg/24h
Continue to wean morphine as per guideline for 3 more weaning steps, then discontinue PHENobarbital
Continue morphine weaning as per guidelines

HIDA Scan

2.5 mg/kg/dose PO BID for 5 days prior to scan
Comments

- **For NAS**: No need to adjust dose based on weight. No levels are required unless toxicity is suspected

Supplied: Elixir: 5 mg/mL
Injection: 30 mg/mL, 120 mg/mL
Tablet: 15 mg

phentolamine - [Rogitine]

Management of Extravasation

Most effective if given within 1 hour of injury but may be used up to 12 hours after.

Go to Medication Management Policy 30.60 "Management of Extravasation" for more information *policy under review*

5 x 0.1 mg (0.2 mL) subcutaneous injections around the circumference of infiltrate (one injection may be given via interstitial cannula if remains in situ). Total dose required depends on the size of extravasation. Dose may be repeated if required.
Maximum: 2.5 mg TOTAL DOSE
Supplied: Injection: 5 mg/mL

phenyTOIN

- **If suspension must be administered through a tube, first dilute 2 to 3-fold with a compatible diluent (e.g. sterile water).**
- **Hold tube feeds for 1-2 hours prior to and 1-2 hours after phenyTOIN administration**

Renal Adjustment ☑

Anticonvulsant

Loading Dose

15-20 mg/kg/dose IV

Maintenance Dose

Start 12 hours after loading dose

2-2.5 mg/kg/dose IV/PO every 12 hours titrate to desired clinical effect
Maximum: 8 mg/kg/24h
Comments

- Some patients may require dosing q8h

Supplied: Capsule: 100 mg
Injection: 50 mg/mL
Suspension: 25 mg/mL
Tablet, Chewable: 50 mg

---

phosphorus (Oral) - [Phosphate]

- **All doses expressed in terms of elemental phosphorus.**
- **All orders must be written in terms of mmol of elemental phosphorus.**
- **1 mmol phosphorus = 1 mmol phosphate**
- Solution (Phoslax®) contains: 4 mmol phosphate and 4.8 mmol sodium/mL
  Each Tablet, Effervescent contains: 500 mg phosphorus = 16.1 mmol of phosphorus

Renal Adjustment ☑

Supplementation for Preterm Neonates

0.16-0.32 mmol/kg/dose PO every 12 hours
Maximum: 1.61 mmol/kg/24h
Comments

- Separate oral administration by at least 2 hours from calcium, iron, aluminum or magnesium containing supplements
- Prescribed amount may not correlate with these recommendations depending on biochemical markers or mineral content of enteral feeds.

Supplied: Solution: 4 mmol/mL
Tablet, Effervescent: 16.1 mmol

---

phytonadione - [Vitamin K]

- Dosing recommendations may vary. The following is based upon the 2018 Position Statement issued by the Canadian Pediatric Society
- Go to Policy 10.35 Medical Directive for the Administration of Phytonadione (Vitamin K1) Intramuscular and Erythromycin Ophthalmic Ointment by Nurses at the IWK working in the Birth Unit and Neonatal Intensive Care Unit
- Go to Policy 50020 The Perinatal Management of Hemophilia A (Factor VIII) and B (Factor IX) Carriers and their Newborns

Vitamin K Deficient Bleeding (Hemorrhagic Disease of the Newborn)

Prophylaxis

Intramuscular

Go to order set IWKNEAD "Newborn Admission Orders"

Go to IWKADOR "NICU Admission Orders"

Oral (If refusal of IM route or if IM administration is contraindicated (e.g. coagulopathy or severe bleeding disorder)
For oral administration, use the 1 mg/0.5 mL injection orally with or without feeds.

2 mg PO once at the first feeding then repeat 2 mg PO at 2-4 weeks and 6-8 weeks of age

Treatment

1-2 mg IV/IM/Subcutaneous once

Comments

- Do not administer IM if coagulopathy present

Supplied: Injection: 2 mg/mL, 10 mg/mL
Tablet: 5 mg (as elemental) **Special Access**

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piperacillin|tazobactam - [Pip-Taz]

Renal Adjustment

Various Indications

Go to Firstline

Supplied: Injection: 3|0.375 gram(s), 4|0.5 gram(s)

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polymyxin B sulfate|bacitracin zinc - [Polysporin equivalent]

January 2020- Polysporin (equivalent) in cream form is no longer on IWK Formulary. Use ointment form (click here for memo).

Antimicrobial

Topical (Ointment)

Manufacturer recommended

Topically to affected area BID to TID
Supplied: Ointment, Topical: 10000|500 units/g

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polymyxin B sulfate|gramicidin - [Polysporin Eye Drop]

Topical (Ophthalmic)

Manufacturer recommended

1-2 drops in affected eye(s) QID
Supplied: Drops, Ophthalmic: 10000|0.025 units/mg/mL

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potassium chloride

- **All dosage guidelines based on mmol of potassium. 1 mmol potassium= 1 mEq potassium**
- **Note: 10 mmol/litre = 10 mEq/litre = 1 mEq/100 mL = 1 mEq%**
- Starting dose should be determined by considering maintenance, losses and desired replacement

CLICK HERE for additional important information on potassium chloride containing solutions, please refer to September 2019 parenteral monograph (currently being reviewed).

Available potassium chloride containing IV solutions at IWK Supply and Distribution

Information on preparing potassium chloride IV solution after hours

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Hypokalemia

Prophylaxis (with diuretic therapy)

1-2 mmol/kg/dose PO daily

or

0.5-1 mmol/kg/dose PO BID

Treatment

1-2.5 mmol/kg/dose PO BID

or

0.67- 1.67 mmol/kg/dose PO TID

Continuous Infusion

Go to clinical order Set IWKKCLHI "Potassium Chloride 1 mEq/mL IV Infusion Orders NICU"

Comments

- Oral solution should be diluted in breast milk or formula prior to administration

Supplied: Capsule, Extended Release: 8 mmol
Injection: 2 mmol/mL **HIGH ALERT**, 0.1 mmol/mL, 1 mmol/mL **HIGH ALERT** **IWK Compounded**
Solution: 1.33 mmol/mL
Tablet, Sustained Release: 20 mmol

procainamide

Renal Adjustment

IV Continuous

Ordered as: ____microgram/kg/min

Loading Dose

7 – 10 mg/kg/dose x 1

Initial Dosing

20 microgram/kg/min

Suggested Titration

10 microgram/kg/min every 30 minutes

Usual Range

20 - 50 microgram/kg/min

Maximum

80 microgram/kg/min

Supplied: Injection: 100 mg/mL

propranolol

Prescribing of propranolol for the indication of infantile hemangioma is reserved/restricted to: Dermatology, ENT, or Plastics

Renal Adjustment

Oral

Initial: 0.25 to 0.5 mg/kg/dose PO every 6 to 8 hours titrated to effect with a usual maximum of 5 mg/kg/24h divided q6-8h

Intravenous

0.01 mg/kg/dose IV every 6 to 8 hours
Maximum: 0.15 mg/kg/dose

Infantile Hemangioma

Prescribing of propranolol for the indication of infantile hemangioma is reserved/restricted to: Dermatology, ENT, or Plastics

May consider TID dosing interval in suspected PHACES syndrome prior to MRI

Week 1

Go to clinical order set IWK_HEINMA "Infantile Hemangioma - Initial Management"

0.5 mg/kg/dose PO BID

Week 2

1 mg/kg/dose PO BID

Week 3 and thereafter

1.5 mg/kg/dose PO BID

Comments

- Monitor heart rate and blood pressure at 1 and 2 hours post initial dose and with any dose changes
- Extremely variable pharmacokinetics and extensive first-pass metabolism makes IV to PO conversion difficult to predict.
- ORAL to IV conversion is approximately 10:1. Use caution when converting and monitor closely.
- A withdrawal syndrome (tachycardia, sweating, hypertension) has been associated with sudden discontinuation of therapy. Taper dose over 1-2 weeks.

Supplied: Injection: 1 mg/mL **HIGH ALERT**
Suspension: 5 mg/mL **IWK Compounded**
Tablet: 10 mg, 40 mg

---

protamine

Please refer to pediatric dosing linked below (same as neonatal)

Supplied: Injection: 10 mg/mL

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pyridoxine - [Vitamin B6]

Pyridoxine-dependent Seizures

Diagnostic

50-100 mg IV/IM once

Maintenance

Oral route preferred

50-100 mg IV/PO daily

Comments

- Higher doses may be required during periods of illness.

Supplied: Injection: 100 mg/mL
Solution: 25 mg/mL **IWK Compounded**
Tablet: 25 mg

---

rifampin

Renal Adjustment

Various Indications

Go to Firstline

Supplied: Capsule: 150 mg, 300 mg
Injection: 600 mg **Special Access**
Suspension: 25 mg/mL **IWK Compounded**

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rocuronium

Intermittent

0.3-0.6 mg/kg/dose IV may be repeated PRN titrate to desired clinical effect. Should not be given more frequently than every 30 minutes.

IV Continuous

Ordered as: ____mg/kg/hour

Loading Dose

Consider 0.5 mg/kg x 1 if patient has not received intermittent dose within the last 2 hours

Initial Dosing

0.5 mg/kg/hour

Suggested Titration

0.1 mg/kg/hour every 30-60 minutes

Usual Range

0.4 – 0.6 mg/kg/hour

Maximum

1 mg/kg/hour

Pre-Intubation

Go to clinical order set IWK NEINT Non−Emergent Intubation in NICU Pre−Medication Orders

Supplied: Injection: 10 mg/mL

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salbutamol

- **For information on Continuous Nebulization in ICU please refer to salbutamol via Aerogen***
- Go to Aerosol Medication Compatibility Guide
- **For information on the use of nebulized medications and COVID, click here**

Bronchodilation

Metered dose Inhaler

100 microgram(s) inhalation every 2 to 6 hours PRN

Nebulization

Salbutamol can be added to 0.9% sodium chloride to provide a total volume of 2-3 mLs

0.1 mg/kg/dose inhalation every 2 to 6 hours PRN
Maximum: 0.5 mg/kg/dose

Hyperkalemia

4 microgram/kg/dose IV once May repeat dose if clinically indicated
Comments

- Consider holding dose if heart rate greater than 180 beats/minute

Supplied: Inhalation, Metered Dose: 100 micrograms/puff
Inhalation, Nebule: 0.5 mg/mL, 2.5 mg/mL, 1 mg/mL
Inhalation, Solution: 5 mg/mL
Injection: 1 mg/mL

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sildenafil

Renal Adjustment

Pulmonary Hypertension

Oral

0.25-0.5 mg/kg/dose PO every 4 to 8 hours May be titrated up to 3 mg/kg/dose PO every 6-12 hours

Continuous Infusion

Ordered as: ____mg/kg/hour

Loading Dose
0.4 mg/kg/dose

Followed By
0.067 mg/kg/hour

Comments

- Hypotension is dose limiting side effect. Monitor blood pressure especially with first or increased dose

Supplied: Injection: 0.8 mg/mL **HIGH ALERT**
Suspension: 2.5 mg/mL **IWK Compounded**
Tablet: 25 mg, 50 mg

sodium bicarbonate

- **1 mmol sodium bicarbonate = 1 mEq sodium bicarbonate**
- 1 mmol sodium bicarbonate ($NaHCO_3$) is equivalent to 84 mg and provides 1 mmol each of sodium AND bicarbonate
- 500 mg tablet contains 6 mmol each of sodium and bicarbonate

Go to Atlantic Canada Poison Centre Antidote Kit for information on antidote administration

***December 1, 2023**: All forms of sodium bicarbonate 4.2% are short. Please refer to parenteral administration section for dilution instructions for sodium bicarbonate 8.4% injection

Renal Adjustment

Antidote

Go to Atlantic Canada Poison Centre Antidote Kit for information on antidote dosing

Correction of Metabolic Acidosis

IV dose (mmol)= 0.3 x weight (kg) x base deficit (mmol/L)
Administer half of calculated dose then assess need for remainder

Usual: 1-2 mmol/kg/dose IV
Maximum: 8 mmol/kg/24h

Occluded feeding tube

Open one capsule of Cotazym and mix contents with one crushed 500 mg tablet of **sodium bicarbonate** (to activate the Cotazym*). Add 5 mL of warm sterile water to the powder. Instill the suspension into the feeding tube and clamp for 5 minutes and then flush with up to 30 mL of sterile water.

Go to AboutKidsHealth "G/GJ tubes: What to do if your child's feeding tube is blocked"

Supplied: Injection: 1 mmol/mL (50 mL Vial) , 1 mmol/mL (50 mL Prefilled Syringe) , 0.5 mmol/mL (5 mL Vial)
Solution: 1 mmol/mL **IWK Compounded**
Tablet: 500 mg

sodium chloride (oral)

- **1 mEq sodium chloride = 1 mmol sodium chloride**

2-5 mmol/kg/24h **divided** PO q2h to q12h (with feeds)
Comments
Preterm infants born 32 weeks or less may require up to 8 mmoL/kg/24 hours for the first 2 weeks of life

Supplied: Capsule: 1 gram(s)
Solution: 2.5 mmol/mL **IWK Compounded**

sodium polystyrene - [Kayexalate]

UNDER REVIEW-JAN 2020

- Oral route generally contraindicated in neonates due to risk of obstruction and intestinal necrosis. May be considered in ***exceptional*** situations
- Contraindicated in neonates with reduced GI motility or obstructive bowel disease
- Use sorbitol-free preparation (powder resin)

Renal Adjustment

Hyperkalemia

1 grams/kg/dose PR every 4 to 6 hours
Supplied: Powder: 1 gram of sodium polystyrene sulfonate/gram of powder
Suspension: 250 mg/mL

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sotalol

Dosing based on mg/m^2 is available in many references but may require an age related dose adjustment in infants and children less than 2 years of age. Refer to Up-to-Date for further information.

Renal Adjustment

Arrhythmias

1 mg/kg/dose PO BID If needed increase dose by 1-2 mg/kg/24 hours. Allow 3 days between dose increments to reach steady state and monitor clinical response
Maximum: 4 mg/kg/dose

or

0.67 mg/kg/dose PO TID If needed increase dose by 1-2 mg/kg/24 hours. Allow 3 days between dose increments to reach steady state and monitor clinical response
Maximum: 2.67 mg/kg/dose
Supplied: Suspension: 5 mg/mL **IWK Compounded**
Tablet: 80 mg

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spironolactone

Renal Adjustment

Diuretic

0.5-1.5 mg/kg/dose PO BID

or

1-3 mg/kg/dose PO daily
Comments
Neonatal Family Resource: Spironolactone Information Sheet

Supplied: Suspension: 5 mg/mL **IWK Compounded**
Tablet: 25 mg

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succinylcholine

Pre-Intubation

Non-emergent

Go to clinical order set IWK NEINT Non–Emergent Intubation in NICU Pre–Medication Orders

Emergent

Go to Neonatal Resuscitation/Pre-Intubation Medications Calculator

Supplied: Injection: 20 mg/mL, 2 mg/mL **IWK Compounded**

sulfamethoxazole|trimethoprim - [Co-trimoxazole, Septra]

- **The only manufacturer product available for co-trimoxazole suspension available in Canada is through the special access program; therefore:**
  - **An alternate choice of antimicrobial may be considered if liquid formulation is required (when clinically appropriate) OR**
  - **Doses may need to be rounded to portions or whole tablet strengths to allow patients to crush for administration.**

Renal Adjustment

Go To Firstline

Supplied: Injection: 80|16 mg/mL
Suspension: 40|8 mg/mL **Special Access**
Tablet: 100|20 mg, 400|80 mg, 800|160 mg

tobramycin

- Preferable to use an alternate agent in renal failure

Renal Adjustment

Various Indications

Go to Firstline

Ophthamic

Manufacturer recommendation

1 drops in affected eye(s) QID

Peritonitis

Intraperitoneally

Go to order set IWKPERPR Peritonitis Protocol Orders

Supplied: Drops, Ophthalmic: 0.3 %, 14 mg/mL **IWK Compounded**
Injection: 40 mg/mL
Ointment, Ophthalmic: 0.3 %

trimethoprim

Renal Adjustment

Urinary Tract Infection

Prophylaxis

Go to Firstline

Supplied: Suspension: 10 mg/mL **IWK Compounded**
Tablet: 100 mg

ursodiol

- **Go to Health Canada warning (2011) Ursodiol- Association of High-Dose with Serious Liver Side Effects**

Cholestasis

Secondary to Parenteral Nutrition

10 mg/kg/dose PO TID
Supplied: Suspension: 20 mg/mL **IWK Compounded**
Tablet: 250 mg

valGANciclovir

Renal Adjustment

Congenital Cytomegalovirus,Treatment

16 mg/kg/dose PO BID
Supplied: Solution: 50 mg/mL
Tablet: 450 mg

vancomycin

For more information on therapeutic drug level monitoring for **parenteral vancomycin**, refer to "Monitoring" section in Firstline

Renal Adjustment

Various Indications

Go to Firstline

Peritonitis

If Vancomycin is also being given IV, reduce IV loading dose to 10 mg/kg/dose IV daily, based on levels (per IWK Nephrology)

Go to order set IWKPERPR Peritonitis Protocol Orders

Supplied: Capsule: 125 mg
Drops, Ophthalmic: 25 mg/mL **IWK Compounded**
Injection: 1 gram(s)
Solution: 25 mg/mL **IWK Compounded**

vasopressin

- **1 unit = 1000 milliunits**
- **There are different dosing units depending on the indication**
- **Do not abruptly discontinue continuous infusion. Taper dose.**

Limited data available for use in neonates

Vasodilatory Shock, Adjunct

IV Continuous

Ordered as: ____milliunits/kg/min

Loading Dose

None

Initial Dosing

0.1 – 0.2 milliunits/kg/min

Suggested Titration

0.1 milliunits/kg/min every hour

Usual Range

0.2 – 1 milliunits/kg/min

Maximum

5 milliunits/kg/min

Supplied: Injection: 20 units/mL

vitamin E

NOTE:
1 unit = 0.45 mg (check with pharmacy to confirm as conversion may vary by manufacturer)

Drops are hyperosmolar and should be diluted in an equal volume of breastmilk, formula or water.

Intraventricular Hemorrhage*

37 weeks or less and/or on greater than 40% oxygen
Start within 48 hours of birth
**Poor quality evidence to support based on heterogeneity of studies*

20-30 mg/kg/dose PO daily for up to 7 days
Supplied: Capsule: 200 units
Drops, Oral: 50 units/mL

voriconazole

- **Dosing in infants and children younger than two is not well established. Small pharmacokinetic studies show that the same mg/kg dosing may be used if there is no alternative treatment**.

Renal Adjustment

Various Indications

Go to Firstline

Supplied: Injection: 200 mg
Suspension: 40 mg/mL
Tablet: 50 mg, 200 mg

white petrolatum|mineral oil - [Eye Lubricant Ointment]

- *Current contract brand Soothe* Night Time*

Ordered as: "Eye lubricant ointment"

Ophthalmic

Manufacturer recommended

Apply 0.5 cm to inside of lower lid in affected eye(s) as needed
Supplied: Ointment, Ophthalmic: 80|20 %

zidovudine

Go to Perinatal HIV Transmission Prophylaxis Clinical Practice Guideline 80.26

Renal Adjustment

Perinatal HIV Transmission Prophylaxis

Initiate as soon as possible after birth, preferably within 6-12 hours of delivery. If the mother has not received zidovudine intrapartum begin immediately

Go to clinical order set IWKHIVINF "HIV Infant / Newborn Orders For infants born to a person living with HIV or unknown HIV status with risk factors"

OR

Go to Firstline

Comments
Neonatal Family Resource: Zidovudine Information Sheet

Supplied: Capsule: 100 mg
Injection: 10 mg/mL
Syrup: 10 mg/mL
