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CHEO Pharmacy

CHEO



CHEO
Pediatric
Doses
of Commonly
Prescribed
Medications

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Introduction

This pamphlet was created to facilitate prescribing at the Children's Hospital of Eastern Ontario (CHEO). Although not all drugs prescribed at CHEO are included, it is directed at the medications mostly commonly prescribed. The Department of Pharmacy is appreciative of the contributions of the many CHEO nurses, pharmacists and physicians that were consulted to produce this pamphlet. The content has been approved by the Department of Pharmacy and Therapeutics Committee. Please note that these dosing guidelines do not apply to special pediatric populations such as Neonatology and Oncology Services.

Do Not Use Abbreviations

Do Not Use	Potential Problem	USE
U (unit)	Mistaken for "0" zero, the number "4" (four) or cc	"unit"
IU (international unit)	Mistaken for IV (intravenous) or the number 10 (ten)	"international unit"
Q.D, QD, q.d (daily)	Mistaken for each other. Period after the Q mistaken for "I" and the O mistaken for "I"	"daily"
Q.O.D., QOD, q.o.d, qod (every other day)		"every other day"
Trailing zero (X.0 mg)*	Decimal point is missed	X mg
Lack of leading zero (.X mg)		0.X mg

*Exception: a "trailing zero" may be used only where required to demonstrate the level of precision of the value being reported, such as laboratory results, imaging studies that report size of lesions, or catheter/tube sizes. It may not be used in medication orders or other medication-related documentation.

MS	Can mean morphine sulphate or magnesium sulphate	"morphine sulfate"
MSO ₄ , and MGSO ₄	Confused for one another	"magnesium sulfate"
ug	Mistaken for mg (milligrams) resulting in a one thousand-fold overdose	"mcg" or "micrograms"
TKVO	Can result in fluid imbalance	State actual infusion rate

Abbreviations for names of medications WILL NOT BE ACCEPTED except for NaCl, KCl, CaGluc.

Acute Pain Management

PHILOSOPHY OF PAIN MANAGEMENT

We believe that:

1. Infants, children and youth have the right to appropriate pain assessment and management.
2. Children of all ages experience pain.
3. Pain assessment is based upon standardized and validated pain assessment tools.
The child's report of pain is considered the best indicator of pain.
4. Whenever possible, children and their families should be involved in pain assessment and management.
5. Pain prevention is better than treatment.
6. Pain management is everyone's responsibility.

PAIN ASSESSMENT

- Use age-appropriate validated pain scales
- Use patient self-report whenever possible as this is deemed to be the gold standard

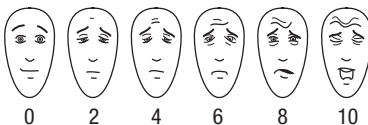
FACES SCALE: REVISED

Faces Pain Scale – Revised (FPS-R)

In the following instructions, say "hurt" or "pain," whichever seems right for a particular child.

"These faces show how much something can hurt. This face [point to left-most face] shows no pain. The faces show more and more pain [point to each from left to right] up to this one [point to right most face] – it shows very much pain. Point to the face that shows how much you hurt [right now]."

Score the chosen face 0, 2, 4, 6, 8, or 10, counting left to right, so '0' = 'no pain' and '10' = 'very much pain.' Do not use words like 'happy' and 'sad'. This scale is intended to measure how children feel inside, not how their face looks.



Permission for use. Published with permission (email dated 24 July 2010) from the International Association for the Study of Pain (IASP) © 2001. Official website: www.usask.ca/childpain/fpsr

Sources. Hicks CL, von Baeyer CL, Spafford P, van Kortaar I, Goodenough B. The Faces Pain Scale – Revised: Toward a common metric in pediatric pain measurement. *Pain* 2001;93:173-183. Bieri D, Reeve R, Champion GD, Adicoat L, Ziegler J. The Faces Pain Scale for the self-assessment of the severity of pain experienced by children: Development, initial validation and preliminary investigation for ratio scale properties. *Pain* 1990;41:139-150.



CHEO METRIC CONVERTER

Metric Conversion	1 mg = 1000 mcg	0.1 mg = 100 mcg	0.01 mg = 10 mcg
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Examples of RATES for OPIOID INFUSIONS

Morphine 0.1 mg/mL (100 mcg/mL)			
Weight (kg)	Dose Ordered: 10 mcg/kg/hr	IV Rate: mL/hr	Dose Ordered: 20 mcg/kg/hr
5		0.5	1
Morphine 1 mg/mL (1000 mcg/mL)			
Weight (kg)	Dose Ordered: 10 mcg/kg/hr	IV Rate: mL/hr	Dose Ordered: 40 mcg/kg/hr
10		0.1	0.4
20		0.2	0.8
30		0.3	1.2
50		0.5	2
70		0.7	2.8
FentaNYL 10 mcg/mL			
Weight (kg)	Dose Ordered: 1 mcg/kg/hr	IV Rate: mL/hr	Dose Ordered: 3 mcg/kg/hr
10		1	3
20		2	6
30		3	9
50		5	15
70		7	21
HYDROmorphone (Dilaudid®) 100 mcg/mL (0.1 mg/mL)			
Weight (kg)	Dose Ordered: 4 mcg/kg/hr	IV Rate: mL/hr	Dose Ordered: 6 mcg/kg/hr
10		0.4	0.6
20		0.8	1.2
30		1.2	1.8
50		2	3
70		2.8	4.2

OPIOID ANALGESIC CONVERSION TABLE FOR ACUTE PAIN

DRUG	Equal Analgesic IM/IV Dose*	Equal Analgesic PO Dose*	IV to PO Conversion Ratio*
Morphine	1 mg	3 mg	1 : 3
FentaNYL	0.01 mg = 10 mcg	n/a	n/a
Codeine	See below#		
HYDRomorphine (Dilaudid®)	0.15 mg = 150 mcg	0.45 mg – 0.75 mg (450 mcg – 750 mcg)	1 : 3 to 1 : 5

* Chronic administration (after 5 to 7 days) will change the conversion ratios between drugs and between parenteral and oral dose comparisons. These comparisons are estimates only based on single dose adult studies. In addition, variation within a patient and between patients may occur.

Codeine is no longer recommended at CHEO (See text for details). An approximate conversion would be: Codeine 30 mg PO to Morphine 4.5 mg PO

OPIOID DOSING FOR PAIN CONTROL

CODEINE – no longer recommended at CHEO for infants and children

- Codeine's analgesic effect is due to 10% of the administered dose of codeine being metabolized into morphine.
- Codeine's efficacy can be unpredictable. After receiving the same weight-appropriate dose of codeine, poor metabolizers may have little or no analgesia while ultra-rapid metabolizers may be at risk of respiratory depression from morphine plasma levels rapidly peaking at potentially 50% higher than normal.

MORPHINE	
MORPHINE IV Intermittent	Usual initial range: 0.05 – 0.1 mg/kg/dose IV/SC q2-4h PRN (usual maximum starting dose 5 mg)
MORPHINE IV infusion	<ul style="list-style-type: none"> • INFANTS less than 6 months: usual initial range: 10 – 20 mcg/kg/hr IV • CHILDREN greater than 6 months: usual initial range: 10 – 40 mcg/kg/hr IV For Breakthrough Pain: Morphine 20 – 50 mcg /kg/dose IV over 5 minutes q2h PRN
MORPHINE Oral	Usual initial range: 0.2 – 0.3 mg/kg/dose PO q4h PRN (usual maximum starting dose 10 mg)

MORPHINE Conversion	Parenteral to Oral Conversion using 1:3 ratio <ul style="list-style-type: none"> ○ morphine 1 mg IV = 3 mg PO ○ morphine 3 mg PO = 1 mg IV Metric conversion <ul style="list-style-type: none"> ○ 1 mg = 1000 mcg ○ 10 mcg = 0.01 mg
FentaNYL	
FentaNYL IV infusion	Usual initial range: 1 – 3 mcg/kg/hr IV For Breakthrough Pain: FentaNYL 0.5 – 1 mcg/kg/dose IV over 5 minutes q1h PRN
HYDROMORPHONE	
HYDRomorphone (Dilaudid®) IV Intermittent	10 – 20 mcg/kg/dose IV q3h PRN (usual maximum starting dose 600 mcg)
HYDRomorphone (Dilaudid®) IV Infusion	Usual initial range: 4 – 6 mcg/kg/hr IV For Breakthrough Pain: HYDRomorphone 10 – 20 mcg/kg/dose IV over 5 minutes q2h PRN
HYDRomorphone (Dilaudid®) Oral	30 – 80 mcg/kg/dose PO q3h PRN (usual maximum starting dose 2000 mcg = 2 mg)
HYDRomorphone (Dilaudid®) conversion	Select the conversion ratio most appropriate for your patient: <p>Parenteral to Oral Conversion using 1:3 ratio</p> <ul style="list-style-type: none"> ○ HYDRomorphone 200 mcg IV = 600 mcg PO ○ HYDRomorphone 600 mcg PO = 200 mcg IV <p>Parenteral to Oral Conversion using 1:5 ratio</p> <ul style="list-style-type: none"> ○ HYDRomorphone 200 mcg IV = 1000 mcg PO ○ HYDRomorphone 1000 mcg PO = 200 mcg IV <p>Metric conversion</p> <ul style="list-style-type: none"> ○ 1 mg = 1000 mcg ○ 100 mcg = 0.1 mg
TO TREAT RESPIRATORY DEPRESSION	
Naloxone (Narcan®)	2 mcg/kg/dose IV direct q 2 minutes. May repeat x 4. Page SPOT team STAT To Prepare: Mix 0.4 mg [400 mcg] (equal to 1 mL of naloxone 0.4 mg/mL) with 9 mL 0.9% NaCl to give 40 mcg/mL

ADJUVANT THERAPY

Acetaminophen (Tylenol®)	10 – 15 mg/kg/dose PO/PR q4h PRN (maximum 75 mg/kg/day or 4000 mg/day)
Celecoxib (CeleBREX®)	2 – 4 mg/kg/dose PO q12h PRN (maximum 400 mg/day) Available as 100 mg capsule, 10 mg/mL suspension
CloNIDine	<p>1 – 4 mcg/kg/dose PO q6–8h (0.1 mg = 100 mcg) (maximum 0.2 mg/dose) Available as 0.1 mg tablet. To make a 10 mcg/mL suspension, dissolve one tablet (0.1 mg = 100 mcg) in 10 mL water. Shake well before administering prescribed dose. Discard unused portion.</p> <p>Although many methods to discontinue CloNIDine exist, these are two suggestions for weaning CloNIDine:</p> <p>CloNIDine oral liquid (Dissolve and Dose Systems): Decrease the total daily dose by approximately 10% every 2 to 3 days. (Calculate 10% of the original dose at the start of the taper for each decrease.) Assess the patient for signs and symptoms of intolerance after each dose decrease. Once 1 mcg/kg/dose is reached, decrease dosing frequency every 2 to 3 days until discontinued (for example: q6h, q8h, q12h, q24h, stop).</p> <p>CloNIDine oral tablet (0.1 mg = 100 mcg per tablet): Decrease by 1/4 tablet (25 mcg) every 2 to 3 days. Assess the patient for signs and symptoms of intolerance after each dose decrease. Once a minimal dose is reached, decrease dosing frequency every 2 to 3 days until discontinued (for example: q6h, q8h, q12h, q24h, stop).</p>
Gabapentin (Neurontin®)	2 – 5 mg/kg/dose PO TID initial dose (maximum 60 mg/kg/day to a maximum of 3600 mg/day)
Ibuprofen	5 – 10 mg/kg/dose PO q6–8h PRN (maximum 600 mg/dose or 40 mg/kg/day)
Ketorolac	0.5 mg/kg/dose IV q6h PRN <p>Maximum Dose: Less than 16 years of age: 15 mg/dose Greater than or equal to 16 years of age: 30 mg/dose or 120 mg/day</p> <p>Maximum Duration: 3 days</p>
Melatonin	0.5 – 3 mg PO qhs (maximum 12 mg/dose)
Naproxen	5 mg/kg/dose PO q8–12h PRN (usual adult dose: 250 – 500 mg PO q12h, maximum 500 mg/dose, 1000 mg/day)

ANTIEMETICS	To treat nausea & vomiting associated with Opioids
DimenhydrINATE (Gravol [®])	0.5 – 1 mg/kg/dose PO/PR/IV q6h PRN (maximum 50 mg/dose or 5 mg/kg/day)
Ondansetron (Zofran [®])	0.1 mg/kg/dose PO/IV q6h PRN (maximum 8 mg/dose, 3 doses per day)
ANTIPRURITICS	To treat pruritus associated with Opioids
DiphenhydrAMINE (Benadryl [®])	0.5 – 1 mg/kg/dose PO/IV q6h PRN (maximum 50 mg/dose or 5 mg/kg/day)
Nalbuphine (Nubain [®])	0.05 mg/kg/dose IV q4h PRN (maximum 5 mg/dose)
LAXATIVES	To prevent/treat constipation associated with Opioids
Polyethylene Glycol (PEG 3350) oral powder	Greater than 6 months of age: 0.5 – 1.5 g/kg/day PO once daily up to 17 g/day Suggested Dosing: 4 – 8 kg: 5 – 10 mL of powder (3.4 – 6.8 g) 9 – 16 kg: 10 – 20 mL of powder (6.8 – 13.6 g) ≥ 17 kg: 25 mL of powder (17 g) Add 5 mL of powder to at least 50 mL water or juice. For 17 g, mix in 250 mL of any beverage (water or juice). Drink once dissolved.
Lactulose oral liquid	Less than 1 year of age: 1 mL/kg/day PO once daily up to maximum of 10 mL Greater than or equal to one year: 10 mL PO once daily up to maximum of 30 mL

If inadequate response to above therapy, consider adding one of the following:

Glycerin rectal suppository	Less than 6 years of age: one infant suppository PR once daily Greater than or equal to 6 years of age: one adult suppository PR once daily
Bisacodyl (Dulcolax [®]) 5 mg oral tablet	3 to 12 years: 0.3 mg/kg/dose PO once daily to a maximum of 10 mg/dose Greater than or equal to 12 years: 5 – 15 mg/dose PO once daily to a maximum of 30 mg/day
Bisacodyl (Dulcolax [®]) 5 and 10 mg rectal suppository	Less than 2 years: maximum 5 mg/dose PR once daily Greater than or equal to 2 years: 5 – 10 mg/dose PR once daily

Gastric Acid Secretion Inhibitors

Ranitidine	<p>Prophylaxis: 4.5 mg/kg/day IV divided q8h for stress ulcer prophylaxis in the PICU (usual adult dose 50 mg IV q6–8h)</p> <p>Treatment: 5 – 10 mg/kg/day PO divided q8–12h (usual adult dose 300 mg PO qhs or 150 mg PO BID to a maximum of 300 mg PO BID)</p>
Lansoprazole (Prevacid®)	<p>< 10 kg: 7.5 mg PO once daily</p> <p>10 – 30 kg: 15 mg PO once daily</p> <p>≥ 30 kg: 30 mg PO once daily</p> <p>Supplied as: 15 and 30 mg capsules; 15 and 30 mg oral disintegrating tablets (Fastabs); 3 mg/mL oral suspension in sodium bicarbonate 1 mmol/mL (8.4%)</p> <p>For once daily dosing, preferred time is 30 to 60 minutes before breakfast.</p> <p>For twice daily dosing, preferred times are 30 to 60 minutes before breakfast and 30 to 60 minutes before supper.</p> <p>Do not chew or crush granules in the tablets or capsules.</p> <p>Capsules – 2 Methods of Administration</p> <ol style="list-style-type: none"> 1. Swallow intact. 2. May open capsule and mix with small amount of acidic food (applesauce). Do not chew the granules. <p>Orally disintegrating tablets – 3 Methods of Administration</p> <ol style="list-style-type: none"> 1. Swallow intact. 2. Place on the tongue. Tablet will disintegrate in less than 1 minute. Do not chew the granules. 3. Dissolve 15 mg tablet in at least 4 mL of water (20 mg tablet in 10 mL of water). Shake gently. Mix thoroughly and administer within 15 minutes (before pellets clump).
Pantoprazole (Pantoloc®)	<p>1 – 1.5 mg/kg/day IV once daily (usual adult dose 40 mg IV once daily)</p>

References

1. **Lexi-Comp assessed June to August 2010**
 - Opioid Analgesics Comparison – Pediatric Lexi-Dugs Online 8/23/10
 - Ketorolac Pediatric Lexi-Dugs 17th, CPS 2010 CPhA monograph
2. **Hospital for Sick Children Formulary 2009-2010**
 - Opioid Equianalgesic Conversion Chart, pg 307
3. **CHEO PPOs:**
 - Ketamine Form # 9030, May 2010
 - Opioid Infusions Form # 9013, Feb 2011
 - PCA Form # 9015, Feb 2011
4. **Crit Care Med. 1998 Aug; 26(8):1433-62**
 - Ranitidine IV prophylaxis dose
5. **Crit Care Med. 1988 Jun; 16(6):591-3**
 - Ranitidine IV prophylaxis dose
6. **Pediatr Crit Care Med. 2010 Jan; 11(1):124-32**
7. **The Internet Journal of Pediatrics and Neonatology 2009; 10(1)**
 - CloNIDine wean
8. **Lamontagne, C., Martelli, B & Rosen, D. (2011)**
 - CHEO: Pediatric Pain Management Dosing Guidelines Handbook

Antimicrobials

ANTIMICROBIAL PRESCRIBING GUIDELINES FOR HOSPITALIZED CHILDREN

- GOALS**
- 1 To optimize antimicrobial use at CHEO.
 - 2 To optimize patient outcomes.
 - 3 To minimize adverse consequences of antimicrobial use.

Important Questions to Ask Before Prescribing an Antimicrobial

- Have cultures been taken?
- Does the patient need an antimicrobial now or can a **'watch and wait'** approach be used?
- Can the antimicrobial treatment be **delayed** until culture results are available?
- Has the **narrowest spectrum** antimicrobial possible to treat the suspected infection been selected?
- Has the appropriate **frequency and dose** been calculated based on the weight of the child?
- What is the **shortest** appropriate duration of therapy that can be used?
- Can antimicrobials be **modified** once culture results are available and susceptibilities confirmed?

Antimicrobials for Common Acute Infections in Hospitalized, Immunocompetent Infants and Children

- For children greater than 8 weeks of age who have no known allergies to beta-lactam antimicrobials
- Modify antimicrobials once a bacterial pathogen is isolated or clinical situation changes
- Consider step down to oral therapy for all infections except infections in the central nervous system
- Duration of antimicrobial therapy depends on clinical and microbiological response

EMPIRIC ANTIMICROBIAL RECOMMENDATIONS FOR COMMON INFECTIONS IN HOSPITALIZED CHILDREN



Infection	Suspected Pathogens	Empiric Antibiotics	Cost ¹
Adenitis, Cervical <i>Not Cat Scratch disease</i>	Group A Streptococcus (<i>Streptococcus pyogenes</i>), <i>Staphylococcus aureus</i> , <i>Streptococcus pneumoniae</i> , <i>Haemophilus influenzae</i>	Cefuroxime IV OR CeFAZolin IV OR Clindamycin IV	\$\$ \$ \$
Cellulitis	Unknown pathogen	CeFAZolin IV PLUS/MINUS clindamycin	\$
	<i>Staphylococcus aureus</i> (MSSA ²)	Cloxacillin IV PLUS/MINUS clindamycin	\$\$
	Group A Streptococcus (<i>Streptococcus pyogenes</i>)	Penicillin IV	\$

Infection	Suspected Pathogens	Empiric Antibiotics	Cost ¹
Meningitis Empiric therapy for suspected bacterial meningitis If indicated, use Dexamethasone	For specific pathogens see <i>Meningitis Treatment Guidelines</i> on <i>CHEOnet</i>	CefTRIAxone ³ IV PLUS Vancomycin IV Dexamethasone 0.6 mg/kg/day IV divided q6h prior to or with first antibiotic dose for 2 – 4 days	\$ \$\$\$
	Unknown pathogen	CeFAZolin IV	\$
Osteomyelitis, Acute	<i>Staphylococcus aureus</i> (MSSA ²)	Cloxacillin IV	\$\$
	Group A Streptococcus (<i>Streptococcus pyogenes</i>), <i>Streptococcus pneumoniae</i> , <i>Haemophilus influenzae</i> , <i>Moraxella catarrhalis</i>	Cefuroxime IV OR Clindamycin IV	\$\$ \$
Acute Periorbital Cellulitis Sinusitis associated	<i>Staphylococcus aureus</i> Group A Streptococcus (<i>Streptococcus pyogenes</i>)	CeFAZolin IV	\$
Pneumonia Community – acquired (mild to moderate)	Bacterial (<i>Streptococcus pneumoniae</i> or Group A Streptococcus – <i>Streptococcus pyogenes</i>) Lobar or Bronchopneumonia	Ampicillin IV OR Cefuroxime IV	\$ \$\$
	If <i>Mycoplasma</i> suspected	Clarithromycin PO	\$
Sepsis/Septic Shock No meningitis		CefTRIAxone ³ IV PLUS Vancomycin IV	\$ \$\$\$
Toxic Shock Syndrome or Necrotizing Fasciitis	Group A Streptococcus (<i>Streptococcus pyogenes</i>)	Penicillin IV PLUS Clindamycin IV PLUS IVIG 2 g/kg/dose IV x 1 ID Consult stat	\$ \$
	<i>Staphylococcus aureus</i> (MSSA ²)	Cloxacillin IV PLUS Clindamycin IV PLUS IVIG 2 g/kg/dose IV x 1 ID Consult stat	\$\$ \$
	Unknown pathogen	CeFAZolin IV PLUS Clindamycin IV PLUS IVIG 2 g/kg/dose IV x 1 ID Consult stat	\$ \$

Infection	Suspected Pathogens	Empiric Antibiotics	Cost ¹
Urinary Tract Infection	Febrile	Ampicillin IV PLUS Gentamicin IV	\$ \$\$
	Resistant Pathogen	CefTRIAxone ³ IV PLUS Gentamicin IV	\$\$\$ \$\$

1. Drug acquisition cost per day: **\$**: \$1-5 **\$\$**: \$5-10 **\$\$\$**: > \$10
2. MSSA represents methicillin (Cloxacillin) sensitive *Staphylococcus aureus*.
MRSA represents methicillin (Cloxacillin) resistant *Staphylococcus aureus*.
3. See CefTRIAxone Dosing Guidelines, page 16.

USUAL PEDIATRIC ANTIMICROBIAL DOSES

Antibiotic	Dose mg/kg/day	Maximum Daily Dose	Route & Dosing Frequency	Half Life (hr)	Pharmacodynamic Goal
Penicillins					 <p>Dosing more frequently</p> <p>OR</p> <p>prolonging the infusion time will optimize bacterial eradication.</p> 
Amoxicillin	60 - 100	4 g	PO divided q8h	1.5	
Amoxicillin/ Clavulanate ¹	60 - 90 Amoxicillin	4 g Amoxicillin	PO divided q8h	1.5	
Ampicillin	200 - 400	12 g	IV divided q6h	1.5	
Cloxacillin	150 - 200	12 g	IV divided q4-6h	1	
Penicillin	250,000 - 400,000 International units	24 million International units	IV divided q4h	0.5	
Piperacillin	200 - 300	24 g	IV divided q4-6 h	0.5	
Piperacillin/ tazobactam	240 Piperacillin	18 g Piperacillin	IV divided q4-8 h ²	0.5	
Cephalosporins					
CefAZolin	100 - 150	6 g	IV divided q6-8h	1.7	
Cefuroxime	150	6 g	IV divided q8h	1.5	
Cefotaxime	200 - 300	12 g	IV divided q6-8h	1.5	
CefTRIAxone ³	100	4 g (2 g/dose)	IV divided q12-24h	7	
CeftAZidime	100 - 150	6 g	IV divided q6-8h	1.5	

Antibiotic	Dose mg/kg/day	Maximum Daily Dose	Route & Dosing Frequency	Half Life (hr)	Pharmacodynamic Goal
Macrolides					
Clarithromycin	15	1 g	PO divided q12h	5	
Erythromycin	50	4 g	IV divided q6h	2	
Fluoroquinolones					
Ciprofloxacin	20 – 30	1.2 g (400 mg/dose)	IV divided q8-12h	2	
Carbapenems					
Meropenem ⁴	60 – 120	6 g	IV divided q6h	1	
Miscellaneous					
Clindamycin	25 – 40	3.6 g	IV divided q6-8h	2.5	
MetroNIDAZOLE	30	4 g	IV divided q6-8h	6	
Vancomycin ⁵	60	4 g	IV q6h	3	
Aminoglycosides					
Gentamicin ⁵ Tobramycin ⁵ <small>Aminoglycoside dosing & monitoring guidelines are found in the Formulary on CHEOnet.</small>	Single Daily Dose: 5 – 7.5 Multiple Dose: 7.5 10 (Cystic Fibrosis)	360 mg/dose before levels 120 mg/dose before levels	IV divided Once Daily IV divided q8h	2	Single daily doses will optimize bacterial eradication.

1. To reduce diarrhea, limit the dose of clavulanate to 10mg/kg/day if possible.
2. If piperacillin/tazobactam is prescribed q8h, administer each dose over 4 hours. (Clin Infect Dis 2007; 44:357–63)
3. **CefTRIAxone Dosing Guidelines – Term Infants greater than or equal to 6 weeks of age**
Serious Infections: 100 mg/kg/day IV/IM divided q12 to q24h (maximum 2 g/dose or 4 g/day)
Bacterial Meningitis: 100 mg/kg/dose IV at 0 hours (maximum 2 g/dose)
Starting at 12 hours, 100 mg/kg/day IV divided q12h (maximum 2 g/dose or 4 g/day)
4. Antimicrobial Restrictions, see page 17.
5. Recommended Dose and Maximum Daily Dose before serum levels.

CHEO 2010 ANTI BIOGRAM SUSCEPTIBILITY PATTERNS

Gram Positive Bacteria	
<i>Streptococcus pneumoniae</i>	<ul style="list-style-type: none"> 97 % of strains are fully susceptible to penicillin and ampicillin. 85 % of strains are fully susceptible to clindamycin.
<i>Staphylococcus aureus</i>	<ul style="list-style-type: none"> 92 % of strains are susceptible to Beta-lactam Antimicrobials such as cloxacillin and ceFAZolin. Consider adding or using vancomycin if patient has MRSA risk factors. ID consult recommended if MRSA suspected.
Coagulase-negative <i>Staphylococcus</i>	E.g. <i>Staphylococcus epidermidis</i> <ul style="list-style-type: none"> All are susceptible to vancomycin.
Gram Negative Bacteria	
<i>Escherichia coli</i>	<ul style="list-style-type: none"> 95 % of strains are susceptible gentamicin. 96 % of strains are susceptible to ceFAZolin. 76 % of strains are susceptible to trimethoprim-sulfamethoxazole.
<i>Klebsiella pneumoniae</i>	<ul style="list-style-type: none"> 94 % of strains are susceptible gentamicin. 97 % of strains are susceptible to ceFAZolin.
<i>Pseudomonas aeruginosa</i>	<ul style="list-style-type: none"> 91 % of strains are susceptible to piperacillin. 84 % of strains are susceptible to tobramycin.

Reference: CHEO Bacteriology Laboratory 2010 Antibiogram, CHEOnet

ANTIMICROBIAL PRESCRIBING RESTRICTIONS

Infectious Diseases approval is required for the following restricted antimicrobial agents except where indicated for the Oncology and Cystic Fibrosis services.

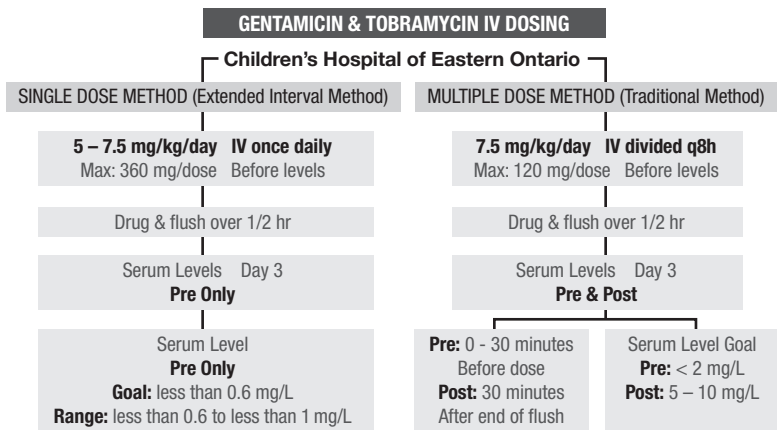
	Restrict to	CHEO Guidelines Available
Amphotericin B Lipid or Liposomal	ID/Onc	
Caspofungin	ID	
Itraconazole oral capsule and suspension	ID/CF	
Meropenem	ID	<input checked="" type="checkbox"/>
QuiNINE IV for malaria during 1 st trimester	ID	<input checked="" type="checkbox"/>
Vancomycin for meningitis > 48 hour therapy	ID	<input checked="" type="checkbox"/>

To obtain Infectious Disease approval, the prescribing physician is to contact the Infectious Diseases (ID) Service. Delay contacting ID for approval until the next day if the restricted antimicrobial is ordered after regular hours (Exception QuinINE IV).

Meropenem is **not indicated** for:

1. First line therapy of community-acquired infections including community acquired meningitis.
2. First line therapy of nosocomial infections when there is no epidemiological or microbiological evidence of resistance to other antimicrobials.

AMINOGLYCOSIDE IV DOSING



AMINOGLYCOSIDES (GENTAMICIN OR TOBRAMYCIN) IV EXTENDED INTERVAL DOSING

(also referred to as Single Daily Dosing method)

Dose: 5 – 7.5 mg/kg/day IV once daily up to a maximum dose of 360 mg before levels

Administration: Drug and Flush over 30 minutes

Serum Levels:

- Order before third dose for patients with normal renal function

- Pre only

Goal: less than 0.6 mg/L (Range: 0.6 to less than 1 mg/L)

Monitor: serum creatinine and pre level once weekly while receiving IV aminoglycosides

Note: This recommendation excludes cystic fibrosis, neonatal, and oncology patients

EMPIRIC ORAL ANTIMICROBIAL THERAPY FOR COMMON PEDIATRIC INFECTIONS IN THE COMMUNITY

The purpose of this document is to provide suggestions of oral antimicrobials for empiric therapy of acute, uncomplicated, presumed bacterial infections occurring in infants and children greater than eight weeks of age who have received recommended immunizations. These guidelines are not meant to replace clinical judgment and only apply to **otherwise healthy children**. Each child's response should be assessed by clinical evaluations.

Important Questions to Ask When Prescribing an Antimicrobial

- Have cultures been taken?
- Does the patient need an antimicrobial now or can a **'watch and wait'** approach be used?
- Can the antimicrobial treatment be **delayed** until culture results are available?
- Has the **narrowest spectrum** antimicrobial possible to treat the suspected infection been selected?
- Has the appropriate **frequency and dose** been calculated based on the weight of the child?
- What is the **shortest** appropriate duration of therapy that can be used?
- Can antimicrobials be **modified** once culture results are available and susceptibilities confirmed?

Infection	Most Common Bacterial Pathogens	Oral Antimicrobial of Choice	Duration
Acute otitis media Healthy children ≥ 2 years of age could be treated for up to 48 hours with oral analgesics such as acetaminophen or ibuprofen. If after 48 hours there is no improvement of symptoms, follow-up and treatment with oral antimicrobial therapy is recommended. If high fever, symptoms or signs suggestive of complications (such as mastoiditis, meningitis, and sepsis) are observed at any time, reassessment is necessary.	<i>Streptococcus pneumoniae</i> AND/OR <i>Moraxella catarrhalis</i> AND/OR <i>Haemophilus influenzae</i> (usually non-encapsulated strains in an immunized child)	Amoxicillin ¹ If suspect resistant <i>Streptococcus pneumoniae</i> : High dose Amoxicillin <u>Beta-lactam allergic</u> : Clarithromycin	10 days Children with uncomplicated infections may be treated for 5-7 days provided appropriate follow-up is assured.
Cellulitis Non-toxic and not systemically ill	<i>Staphylococcus aureus</i> Group A Streptococcus ²	Cloxacillin Cephalexin <u>Beta-lactam allergic</u> : Clindamycin	7 to 10 days

Infection	Most Common Bacterial Pathogens	Oral Antimicrobial of Choice	Duration
Community-acquired Pneumonia Mild and not associated with influenza	<i>Streptococcus pneumoniae</i> Group A Streptococcus ²	Amoxicillin ¹ <u>Beta-lactam allergic:</u> Clarithromycin	7 to 10 days
	If suspect <i>Mycoplasma</i> or <i>Chlamydia</i>	Clarithromycin	
Pharyngitis Strep Throat	Group A <i>Streptococcus</i> ²	Penicillin tablet ³ Amoxicillin Suspension/capsule <u>Beta-lactam allergic:</u> Clindamycin OR Clarithromycin	10 days
Acute Sinusitis Less than 3 weeks duration	<i>Streptococcus pneumoniae</i> AND/OR <i>Moraxella catarrhalis</i> AND/OR Group A <i>Streptococcus</i> ² AND/OR <i>Haemophilus influenzae</i>	Amoxicillin ¹ Amoxicillin/ clavulanic acid <u>Beta-lactam allergic:</u> Clarithromycin	14 to 21 days
Non-febrile Lower Urinary Tract Infections ≥ 2 years i.e. cystitis, not pyelonephritis or systemically ill	Enterobacteriaceae (e.g. <i>E. coli</i>) but urine analysis/microscopy and urine culture should be obtained. Treatment may be modified if necessary once susceptibilities are available.	Cephalexin Sulfamethoxazole/ Trimethoprim	7 days for children with normal anatomy 10-14 days if urinary tract abnormality

¹ Children who have been treated with amoxicillin in the past month should receive high dose amoxicillin with or without clavulanic acid.

² Group A *Streptococcus* refers to *Streptococcus pyogenes*.

³ Penicillin VK tablets are preferred as the oral liquid has an unpleasant taste.

USUAL PEDIATRIC ANTIMICROBIAL ORAL DOSES

Antimicrobial	Oral Dose¹	Frequency	Taste	Cost²
Amoxicillin ³	60 mg/kg/day Maximum 4 g/day	TID ⁴	Very good	\$
Amoxicillin high dose ³	80 to 100 mg/kg/day Maximum 4 g/day	TID ⁴	Very good	\$\$
Amoxicillin/clavulanate (Clavulin [®]) ^{3,5} 7:1 formulation recommended ⁶	60 to 90 mg/kg/day amoxicillin Maximum 4 g/day amoxicillin	TID ⁴	Good	\$\$\$\$
Cefuroxime axetil	30 mg/kg/day Maximum 1 g/day	BID	Unpleasant tasting oral liquid; tablets available	\$\$\$\$
Cephalexin	50 mg/kg/day Osteomyelitis: 100 – 150 mg/kg/day Maximum 4 g/day	QID	Very good	\$
Clarithromycin (Biaxin [®])	15 mg/kg/day Maximum of 1 g/day	BID	Good	\$\$\$\$
Clindamycin	20 to 30 mg/kg/day Maximum 1.8 g/day	TID	Unpleasant oral liquid; capsules available	\$\$\$\$
Cloxacillin	50 to 100 mg/kg/day Osteomyelitis: 100 – 150 mg/kg/day Maximum 4 g/day	QID	Unpleasant tasting oral liquid; capsules available	\$\$\$
Penicillin V	50 – 100 mg/kg/day Maximum 3 g/day	TID	Unpleasant oral liquid ⁷ ; tablets available	c
Sulfamethoxazole/ Trimethoprim	8 to 12 mg/kg/day TMP Maximum of 320 mg/day TMP (equal to 2 double strength tablets per day)	BID	Very good	c

All the listed antimicrobials may be taken with food.

See page 22 for footnotes 1-7.

- ¹ It is important to remember not to exceed the recommended adult dose. These dosing guidelines are provided for patients with normal renal function.
- ² Drug Acquisition Cost per Day of oral liquid. This estimate utilizes ODB prices and does not include mark-up or dispensing fee:
c: < \$ 1/day **\$:** \$ 1-2/day **\$\$:** \$2-3/day **\$\$\$:** \$3-4/day **\$\$\$\$:** > \$4/day
- ³ Children who have been treated with amoxicillin in the past month should receive high dose amoxicillin with or without clavulanic acid.
- ⁴ As the half-life of amoxicillin is approximately one hour, TID dosing is preferred over BID.
- ⁵ To reduce diarrhea, limit the dose of clavulanate to 10 mg/kg/day if possible.
- ⁶ To minimize diarrhea caused by clavulanic acid, oral formulations with the ratio of amoxicillin to clavulanic acid of at least 7 to 1 are preferred (until 14:1 formulations are available in Canada). Examples include: amoxicillin 400 mg plus clavulanic acid 57 mg per 5 mL and amoxicillin 875 mg plus clavulanic acid 125 mg per tablet.
- ⁷ Penicillin VK tablets are preferred as the oral liquid has an unpleasant taste.

Surgical Prophylaxis

CHEO ANTIMICROBIALS FOR SURGICAL PROPHYLAXIS

- Infusion to be prepared and hung by nursing in Day Surgery (outpatients) or the floor/unit (inpatients) and started by the Anesthesiologist in the operating room
- If patient has a **HISTORY OF METHICILLIN-RESISTANT *Staphylococcus aureus* (MRSA) INFECTION** or is **COLONIZED WITH MRSA**: suggest Infectious Disease consult

PRE-OPERATIVE RECOMMENDATIONS

1. Do NOT administer a penicillin or a cephalosporin antimicrobial if the patient has a known immediate-type hypersensitivity to penicillin (urticaria, bronchospasm, anaphylaxis).
2. Infusion of the first dose of antimicrobial should begin **WITHIN 60 minutes** of the surgical incision.
3. **Single-dose pre-operative prophylaxis** is recommended.
4. **Operations greater than 4 hours duration** may require re-administration of IV antimicrobials to maintain therapeutic antimicrobial levels at the site of wound closure especially if there is excessive blood loss or extended use of cardiopulmonary bypass.
5. Doses quoted are for the intravenous route and for patients with normal renal function. Do not exceed the maximum adult dose.

POST-OPERATIVE RECOMMENDATIONS

6. **Single-dose post-operative prophylaxis** is recommended (see note for cardiovascular surgery).
7. If antimicrobials are to continue, complete a TOTAL of NO MORE than 24 hours (48 hours for cardiovascular surgery).
8. When there is a presence of perforation, abscess, gangrene or active infectious process, institute **treatment** rather than prophylaxis.
9. Do not repeat the gentamicin dose for 24 hours as the dose quoted is intended for a 24 hour dosing interval.
10. Recommended antimicrobial prophylaxis following cardiovascular surgery (Term Infants):
 - Less than 1 week old: Cefazolin 40 mg/kg/dose IV q12h x 4 doses
 - Greater than 1 week old: Cefazolin 40 mg/kg/dose IV q8h x 6 doses

Procedure ²	Antimicrobials for Surgical Prophylaxis <i>Not penicillin-allergic</i>				<i>Known immediate-type hypersensitivity to penicillin (urticaria, bronchospasm, anaphylaxis)^j</i>	Maximum Post-operative Duration (Hours) for Surgical Prophylaxis ^{6,7,8}
	Drug Name	Pediatric IV mg/kg/dose ^{3,5}	Adult IV Max dose ⁵	During Anaesthesia Re-Dosing ⁴		
Cardiovascular Surgery	CeFAZolin	25-50	Initial Dose: 2000 mg Repeat Doses: 1000 mg	q4h	IV Vancomycin 15 mg/kg/dose (MAX of 1 g/dose) to repeat q8h during surgical procedure PLUS IV Gentamicin 5 mg/kg/dose (MAX of 360 mg/dose) x 1 dose only ⁹	48 hours ¹⁰
Central Venous Catheter Placement	Not recommended					
Appendicitis						
1. Appendicitis Simple (not perforated)	Gentamicin ⁹ MetroNIDAZOLE (Flagyl [®]) May Add Ampicillin	5 10 50	360 mg 500 mg <u>Initial Dose:</u> 2000 mg <u>Repeat Doses:</u> 1000 mg	Not required q8h q4h	Omit Ampicillin	24
2. Appendicitis Complicated (perforated/peritoneal spillage)	Gentamicin ⁹ MetroNIDAZOLE (Flagyl [®])	5-7 10	360 mg 500 mg	Not required q8h		Start Treatment course. Continue until afebrile X 24 hours, ileus resolved & WBC normalized

Procedure ²	Antimicrobials for Surgical Prophylaxis <i>Not penicillin-allergic</i>				<i>Known immediate-type hypersensitivity to penicillin (urticaria, bronchospasm, anaphylaxis)¹</i>	Maximum Post-operative Duration (Hours) for Surgical Prophylaxis ^{6,7,8}
	Drug Name	Pediatric IV mg/kg/dose ^{3,5}	Adult IV Max dose ⁵	During Anaesthesia Re-Dosing ⁴		
Head & Neck Cochlear implant	CeFAZolin	25	<u>Initial Dose:</u> 2000 mg <u>Repeat Doses:</u> 1000 mg	q4h	IV Clindamycin 10 mg/kg/dose (MAX of 600 mg/dose), to repeat q6h during surgical procedure	24
Neurosurgery Any craniotomy, shunt insertion, revision	CeFAZolin	25	<u>Initial Dose:</u> 2000 mg <u>Repeat Doses:</u> 1000 mg	q4h	If MRSA is present or likely, IV Vancomycin 15 mg/kg/dose (MAX of 1 g/dose) to repeat q8h during surgical procedure	24
Orthopaedic Surgery Spinal surgery or Orthopaedic procedures with implant/ fixation devices	CeFAZolin	25	<u>Initial Dose:</u> 2000 mg <u>Repeat Doses:</u> 1000 mg	q4h	IV Clindamycin 10 mg/kg/dose (MAX of 600 mg/dose), to repeat q6h during surgical procedure	24
Plastics Placement of spacers, implants, etc, in clean wound	CeFAZolin	25	<u>Initial Dose:</u> 2000 mg <u>Repeat Doses:</u> 1000 mg	q4h	IV Clindamycin 10 mg/kg/dose (MAX of 600 mg/dose), to repeat q6h during surgical procedure	24

PREVENTION OF BACTERIAL ENDOCARDITIS

ANTIMICROBIAL PROPHYLAXIS FOR DENTAL PROCEDURES

Drug of Choice	Single Dose Antimicrobial Prophylaxis <i>Not penicillin-allergic</i>				Known immediate-type hypersensitivity to penicillin (urticaria, bronchospasm, anaphylaxis) ¹
	Drug Name	Pediatric mg/kg/dose ⁵	Adult Max dose ⁵	Timing	
Drug of Choice	Amoxicillin PO x 1	50	2000 mg	1 hour before procedure	Clindamycin PO 10-20 mg/kg/dose (MAX of 600 mg/dose) 1 hour before procedure OR Clarithromycin PO 15 mg/kg/dose (MAX of 500 mg/dose) 1 hour before procedure
Alternative ²	Cephalexin PO x 1	50	600 mg	1 hour before procedure	
Unable to take Oral medication	Ampicillin IV/IM x 1	50	2000 mg	30 minutes before procedure	Clindamycin IV 10-20 mg/kg/dose (MAX of 600 mg/dose) 30 minutes before procedure
Alternative ³	CeFAZolin IV/IM x 1	50	2000 mg		

¹ Do NOT administer a penicillin-type or a cephalosporin antimicrobial if the patient has a known immediate-type hypersensitivity to penicillin (urticaria, bronchospasm, anaphylaxis).

² Oral Medication Required: Prescribe cephalexin when unable to tolerate amoxicillin but cephalosporin antimicrobial not contraindicated.

³ IV Medication Required: Prescribe ceFAZolin IV when unable to tolerate ampicillin but cephalosporin antimicrobial not contraindicated.

⁴ If the patient has a history of methicillin-resistant *Staphylococcus aureus* (MRSA) infection or is colonized with MRSA, an infectious disease consult is suggested.

⁵ Doses quoted are for patients with normal renal function. Do not exceed the maximum adult dose.

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1. Red Book, American Academy of Pediatrics 2009, pages 826-827 (AHA 2007)
2. Sick Kids Drug Handbook and Formulary 2010/2011, pages 222-223

Palliative Care

INTRODUCTION

This section is intended for use by members of the Pediatric Palliative Care Outreach Team including fellows and residents at the Children's Hospital of Eastern Ontario. It provides an overview of dosing guidelines for the management of pain and other distressing symptoms common in patients referred to the Pediatric Palliative Care Outreach Team. The initial maximum doses quoted in this handbook are to guide first doses only. Dose escalation should be based on the pharmacology of each drug and the dosing history of each individual patient.

For many children, a non-pharmacologic approach to Pain and Symptom Management is very effective.

For infants less than 4 weeks of age, please refer to the CHEO Neonatal Manual.

OPIOIDS FOR PAIN CONTROL

MORPHINE	Refer to Acute Pain Management section – SC dose same as IV
FentaNYL IV	Refer to Acute Pain Management section
FentaNYL PATCH	Not for acute pain management
	<ul style="list-style-type: none"> - To convert from other opioids, refer to Health Canada Dose Conversion Guidelines for FentaNYL Systems (8 March 2010) - Conversion: Morphine PO 60 to 134 mg total per day approximates 25 mcg/hr - CHEO suggests starting at 12 mcg/hr for children receiving at least 45 mg of oral morphine equivalents per day Patches available at CHEO: 12, 25, 50, 75 and 100 mcg/hr - Change patch q 48-72 h (change more frequently if poor fat depot) - Do not cut the patch
HYDROMORPHONE	Refer to Acute Pain Management section – SC dose same as IV
METHADONE	ONLY a physician who has received an exemption from Health Canada pursuant to section 56 of the Controlled Drugs and Substances Act can prescribe, change, or discontinue methadone orders.

CADD INFUSIONS

The Palliative Care Team sometimes uses Continuous Ambulatory Delivery Device (CADD) infusions to control pain and/or dyspnea. To maintain comfort when admission to hospital is necessary, these are continued or simulated using a patient controlled analgesia (PCA) pump. Rates and bolus doses in the table below are guidelines only. IV and SC doses are identical.

Drug & Route*	Concentration	Bolus	Lockout (minutes)	Basal
Morphine IV/SC	1 mg/mL	20 mcg/kg/dose	6 – 8 min	4 – 15 mcg/kg/hr
HYDR0morphine (Dilaudid®) IV/SC	100 mcg /mL	4 mcg/kg/dose	6 – 10 min	1 – 4 mcg/kg/hr
FentaNYL IV	10 mcg /mL	0.25 mcg/kg/dose	5 – 8 min	0.15 – 0.5 mcg/kg/hr Initial maximum: 50 mcg/hr
Midazolam IV/SC*	1 mg/mL	50 mcg/kg/dose	10 min	10 mcg/kg/hr

* SC restricted to Palliative Care

TO TREAT RESPIRATORY DEPRESSION NOT RELATED TO THE UNDERLYING PROCESS

Naloxone (Narcan®)	2 mcg/kg/dose IV direct q 2 minutes. May repeat x 4. If treating a patient admitted to CHEO, Page SPOT team STAT To Prepare: Mix 0.4 mg [400 mcg] (equal to 1 mL of naloxone 0.4 mg/mL) with 9 mL 0.9% NaCl to give 40 mcg/mL
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ADJUVANT THERAPY

Acetaminophen ORAL	Refer to Acute Pain Management section
Acetaminophen RECTAL	Avoid rectal route in neutropenic patients 10 – 15 mg/kg/dose PR q4h PRN (maximum 75 mg/kg/day or 4000 mg/day)
Amitriptyline	To induce sleep 0.1 mg/kg/dose PO qhs (initial maximum 1 mg/kg/dose to maximum of 50 mg/dose)
Celecoxib	Refer to Acute Pain Management section

CloNIDine	Refer to Acute Pain Management section - opioid sparing - wean to discontinue
Gabapentin	Refer to Acute Pain Management section - prescribed for neuropathic pain - wean to discontinue
Ibuprofen	Refer to Acute Pain Management section
Ketamine	Refer to CHEO preprinted physician order - potent analgesic properties - may spare opioid use in sub-anesthetic doses ORAL 0.5 – 1 mg/kg/dose PO Usual frequency: q2-3h IV 100 – 300 mcg/kg/hour IV (maximum 1500 mcg/kg/hour)
Ketorolac	Refer to Acute Pain Management section
Melatonin	Refer to Acute Pain Management section - prescribed to induce sleep
BENZODIAZEPINES	To alleviate muscle spasms and anxiety
Diazepam (Valium®)	0.03 – 0.2 mg/kg/dose PO/PR/IV q6h PRN (initial maximum 5 mg/dose)
LORazepam (Ativan®)	0.02 – 0.05 mg/kg/dose PO/SL/IV q4 – 8h PRN (initial maximum 0.1 mg/kg/dose to a maximum of 2 mg/dose)
Midazolam (Versed®)	- see also CADD continuous infusions - SC restricted to Palliative Care 24 – 120 mcg/kg/hr IV/SC (initial maximum 360 mcg/kg/hr)
BENZODIAZEPINE ANTAGONIST	For sedation not related to underlying disease process
Flumazenil	0.01 mg/kg/dose IV over 15 seconds (maximum 0.2 mg/dose) IV q 1 min as required or until a maximum total cumulative dose of 1 mg is given. If re-sedation occurs, repeat bolus dose every 20 min or start infusion of 5 – 10 mcg/kg/hr (equal to 0.005 - 0.01 mg/kg/hr)

ANTIEMETICS	To treat nausea & vomiting associated with Opioids
DimenhydrINATE	Refer to Acute Pain Management section - PR/SC same dose as PO/IV - avoid rectal route in neutropenic patients
Methotrimeprazine (Nozinan®)	- phenothiazines may cause extrapyramidal, anticholinergic and altered cardiac conduction effects ORAL 0.08 mg/kg/dose PO q8h PRN. Gradually increase based on response. (Children < 12 years initial maximum 40 mg/day) IV 0.2 mg/kg/dose IV q4h PRN (initial maximum 0.4 mg/kg/dose to a maximum of 10 mg/dose)
Metoclopramide (Maxeran®)	- higher doses used for chemotherapy-induced nausea and vomiting 0.1-0.2 mg/kg/dose PO/IV q6 - 8h PRN (initial maximum 10 mg/dose)
Nabilone	<u>Children > 4 yrs</u> < 18 kg: 0.5 mg PO BID 18 - 30 kg: 1 mg PO BID > 30 kg: 1 mg PO BID – TID
Ondansetron	Refer to Acute Pain Management section
Prochlorperazine (Stemetil®)	0.1 mg/kg/dose PO/PR/IV q8h PRN (initial maximum 10 mg/dose or 40 mg/day)
ANTIPRURITICS	To treat pruritus associated with Opioids
DiphenhydrAMINE	Refer to Acute Pain Management section - SC restricted to Palliative Care - SC may cause local irritation
HydroXYzine (Atarax®)	0.5 mg/kg/dose PO q6h PRN (initial maximum 25 mg/dose or 400 mg/day)
Nalbuphine	Refer to Acute Pain Management section
Naloxone	0.25 – 2 mcg/kg/hr IV (Doses > 2 mcg/kg/hr increase risk of loss of pain control)

LAXATIVES	
OSMOTIC AGENTS	
Glycerin	Refer to Acute Pain Management section
Lactulose	Refer to Acute Pain Management section
Polyethylene Glycol 3350 (PEG 3350)	Refer to Acute Pain Management section
STIMULANTS	
Bisacodyl	Refer to Acute Pain Management section
Sennosides (Senokot®)	<p>- Sennosides 1.76 mg/mL or 8.6 mg/tablet</p> <p>Infants 1 month – 2 years: 1.25 – 2.5 mL PO qhs. Not to exceed 5 mL/day PO</p> <p>2 to < 6 years: 2.5 – 3.75 mL or 4.3 mg (1/2 tab) PO qhs. Not to exceed 3.75 mL PO BID or 1 tab PO BID</p> <p>6 – 12 years: 5 – 7.5 mL or 1 tab PO qhs. Not to exceed 7.5 mL BID or 2 tabs PO BID</p> <p>Adolescents/Adults: 10 – 15 mL or 2 tabs PO qhs. Not to exceed 15 mL PO BID or 4 tabs PO BID</p>

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EDITION 1

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