ST. LOUIS CHILDREN'S HOSPITAL
PEDIATRIC EMPIRIC TREATMENT RECOMMENDATIONS FOR SELECT INFECTIONS

This document provides guidance on empiric treatment recommendations for select infections based upon current guidelines and local antibiogram data. Therapy should be modified based upon patient specific culture results once available.

BONE AND JOINT
- Open fracture prophylaxis / lawnmower accident
- Osteomyelitis, acute
- Septic arthritis

CENTRAL NERVOUS SYSTEM
- Brain abscess
- CSF shunt infections
- Meningitis (CSF pleocytosis present), patient ≤ 28 days of age
- Meningitis (CSF pleocytosis present), patient > 28 days of age
- Meningoencephalitis, Herpes Simplex Virus

GASTROINTESTINAL / ABDOMINAL
- Appendicitis
- Button battery ingestion prophylaxis
- Cholangitis
- *Clostridioides difficile* infection
- Diarrhea, infectious
- Intra-abdominal infection (community acquired)
- Necrotizing enterocolitis (NEC) / spontaneous intestinal perforation (SIP)
- Spontaneous bacterial peritonitis (SBP)

GENITOURINARY TRACT
- Bacterial vaginosis
- Epididymitis
- Genital herpes
- Pelvic inflammatory disease (PID)
- Sexually transmitted infection (STI)
  - *Neisseria gonorrhoeae*
  - *Chlamydia trachomatis*
  - Syphilis
  - Trichomoniasis
- Urinary tract infection

HEENT
- Acute otitis media
- Dental abscess
- Mandible fracture prophylaxis
- Mastoiditis
- Orbital cellulitis (post-septal)
- Periorbital cellulitis (pre-septal)
- Pharyngitis (GAS)
- Retro- or para- pharyngeal abscess
- Sinusitis, acute bacterial
- Tonsillar or peritonsillar abscess

RESPIRATORY TRACT
- Aspiration pneumonia
- Community acquired pneumonia (CAP), uncomplicated
- Community acquired pneumonia (CAP), complicated
- Hospital / Ventilator associated pneumonia (HAP/VAP)
- Influenza
- Tracheitis (intubated / tracheostomy)
- Tracheitis (non-intubated following croup-like illness)

SKIN AND SOFT TISSUE
- Cellulitis (nonpurulent)
- Cellulitis / abscess (purulent)
- Human bite / Animal bite
- Lymphadenitis, suppurative
- Necrotizing fasciitis
- Pyomyositis
- Staphylococcal scalded skin

MISCELLANEOUS
- Febrile neutropenia (hematology/oncology patients)
- Lemierre's syndrome
- R/O catheter-associated bloodstream infection (CLABSI)
- R/O sepsis 0-21 days (no central lines and no concern for meningitis)
- R/O sepsis > 21 days (no central lines and no concern for meningitis)
- Sickle cell disease with fever
- Tickborne infections
- Toxic shock syndrome

* Durations listed are based on the literature cited or has been agreed upon by the ID division. Some duration of therapies have large variability and are too dependent on clinical course to be specific. Doses provided assume normal renal and hepatic function. Some may require renal or hepatic dose adjustments.

** These recommendations do not establish a standard of care to be followed in every case. Each case is different and the individuals providing health care are expected to use their judgement in determining what is in the best interests of the patient based on the circumstances at the time.

Diagnosis	Common Pathogens	Preferred Empiric Drug(s)	Alternative Drug(s) for Allergy or Clinical Severity	Duration*	Comments
Bone and Joint [1-6]					
Open fracture prophylaxis / Lawnmower accident	Polymicrobial	OPEN FRACTURES: Cefazolin 33 mg/kg/dose IV q8h (max: 2000 mg/dose) OR Cephalexin 25 mg/kg/dose q12h (max: 500 mg/dose) TYPE III OPEN FRACTURES OR THOSE WITH SIGNIFICANT CONTAMINATION: Cefazolin 33 mg/kg/dose IV q8h (max: 2000 mg/dose) **PLUS** Gentamicin 4 mg/kg/dose IV q12h OR tobramycin 4 mg/kg/dose IV q12h for *Pseudomonas aeruginosa* coverage (not usually required)	ALLERGY: OPEN FRACTURES: Clindamycin 13mg/kg/dose IV/PO q8h (max: 600 mg/dose) TYPE III OPEN FRACTURES OR THOSE WITH SIGNIFICANT CONTAMINATION: Clindamycin 13mg/kg/dose IV/PO q8h (max: 600 mg/dose) **PLUS** Gentamicin 4 mg/kg/dose IV q12h OR tobramycin 4 mg/kg/dose IV q12h for *Pseudomonas aeruginosa* coverage (not usually required)	Prophylaxis: 24 hours For Type III open fractures, may go up to 72 hours with delayed closure and repair Antibiotic prophylaxis should not extend >24 hours after skin closure for open fractures.	Consider ID Consult Verify tetanus vaccine status. See Appendix 3 below or the Red Book Tetanus Section, Table 3.68, for recommendations. Cultures for routine, fungal, and acid-fast pathogens are indicated **at the time an infection is suspected**.
Osteomyelitis, acute	MSSA or MRSA *S. pyogenes* *K. kingae* (patients 3 months – 4 years)	Cefazolin 33 mg/kg/dose IV q8h (max: 2000 mg/dose) IF H/O MRSA COLONIZATION/ INFECTION OR HOUSEHOLD CONTACT WITH MRSA: Clindamycin 13mg/kg/dose IV/PO q8h (max: 600 mg/dose) IF TOXIC OR BACTEREMIC: Vancomycin (see dosing guide) **PLUS** Ceftriaxone 50 mg/kg/dose IV q24h (max: 2000 mg/dose)	IN PATIENTS WITH SICKLE CELL DISEASE Ampicillin/sulbactam 50 mg/kg/dose ampicillin component IV q6h (max: 2000 mg/dose)	3-4 weeks	Recommend ID Consult Vancomycin trough goal 10-15 mcg/mL In clinically stable patients, consider delaying antibiotics if bone biopsy planned ORAL DOSING RECOMMENDATIONS FOR MSSA BONE/JOINT INFECTIONS: Cephalexin 40 mg/kg/dose PO q8h (max: 1500 mg/dose) OR Cefadroxil 25 mg/kg/dose PO q12h (max: 2000 mg/dose)

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Diagnosis	Common Pathogens	Preferred Empiric Drug(s)	Alternative Drug(s) for Allergy or Clinical Severity	Duration*	Comments
Septic arthritis	MSSA or MRSA *S. pyogenes* *S. pneumoniae* *N. gonorrhoeae* *K. kingae* (patients 3 months – 4 years)	Cefazolin 33 mg/kg/dose IV q8h (max: 2000 mg/dose) IF H/O MRSA COLONIZATION/ INFECTION OR HOUSEHOLD CONTACT WITH MRSA: Clindamycin 13mg/kg/dose IV/PO q8h (max: 600 mg/dose) IF TOXIC OR BACTEREMIC: Vancomycin (see dosing guide) **PLUS** Ceftriaxone 50 mg/kg/dose IV q24h (max: 2000 mg/dose)	IF GRAM-NEGATIVES SEEN ON GRAM STAIN: Ceftriaxone 50 mg/kg/dose IV q24h (max: 2000 mg/dose) If gonorrhea is confirmed or strongly suspected, consider testing and treating for chlamydia. See Sexually Transmitted Infection Section	2-3 weeks	Recommend ID Consult Vancomycin trough goal 10-15 mcg/mL ORAL DOSING RECOMMENDATIONS FOR MSSA BONE/JOINT INFECTIONS: Cephalexin 40 mg/kg/dose PO q8h (max: 1500 mg/dose) OR Cefadroxil 25 mg/kg/dose PO q12h (max: 2000 mg/dose)
Central Nervous System [7-9]					
Brain Abscess	*S. anginosus* group Gram-negatives Anaerobes MSSA or MRSA	Vancomycin (see dosing guide) **PLUS** Ceftriaxone 50mg/kg/dose IV q12h (max: 2000 mg/dose) **PLUS** Metronidazole 10 mg/kg/dose IV q8h (max: 500 mg/dose)	CEPHALOSPORIN ALLERGY: Vancomycin (see dosing guide) **PLUS** Meropenem 40 mg/kg/dose IV q8h (max: 2000 mg/dose)	At least 4 weeks	Recommend ID Consult Vancomycin trough goal 15-20 mcg/mL
CSF shunt infections	CoNS, *S. aureus*, aerobic Gram-negative bacilli (including *P. aeruginosa*), *Cutibacterium acnes*	Vancomycin (see dosing guide) **PLUS** Cefepime 50 mg/kg/dose IV q8h (max: 2000 mg/dose)	CEPHALOSPORIN ALLERGY: Vancomycin (see dosing guide) **PLUS** Meropenem 40 mg/kg/dose IV q8h (max: 2000 mg/dose)	See Shunt Protocol for shunt infections	Recommend ID Consult Vancomycin trough goal 15-20 mcg/mL

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Meningitis (CSF pleocytosis present), patient ≤ 28 days of age	*E. coli* *S. agalactiae* (GBS) *L. monocytogenes*	Ampicillin **PLUS** Ceftazidime OR Ceftriaxone* (see column to the right) (see Neonatal Dosing Guide)	*Patients meeting the following criteria may receive Ampicillin PLUS Ceftriaxone: • ≥ 7 days of age • Corrected (current) gestational age ≥ 35 weeks • Not currently receiving calcium containing solutions or parenteral nutrition • Total Serum Bilirubin (Tbili) < 5 mg/dl [A] • Albumin within normal limits [A]	*N. meningitidis:* 7 days *H. influenzae:* 7 days *S. pneumoniae:*10-14 days *S. agalactiae* (GBS): 14-21 days Gram-negative bacilli: 14-21 days *L. monocytogenes:* ≥ 21 days	Recommend ID Consult [A] In patients who qualify for ceftriaxone based on age and corrected GA, it is not always necessary to wait for Tbili and albumin to result before placing order. In most, the bilirubin-albumin binding capacity has matured, but clinical judgment is warranted.
Meningitis (CSF pleocytosis present), patient > 28 days of age	*S. pneumoniae* *N. meningitidis* *S. agalactiae* (GBS) *H. influenzae*	Ceftriaxone 50 mg/kg/dose IV q12h (max: 2000 mg/dose) **PLUS** Vancomycin (see dosing guide)	CEPHALOSPORIN ALLERGY: Vancomycin (see dosing guide) **PLUS** Meropenem 40 mg/kg/dose IV q8h (max: 2000 mg/dose)		Recommend ID Consult Vancomycin trough goal 15-20 mcg/mL
Meningoencephalitis, Herpes Simplex Virus	HSV1 or HSV2	IN ADDITION TO EMPIRIC ANTIBIOTICS FOR MENINGITIS: < 3 months: Acyclovir 20 mg/kg/dose IV q8h 3 month – 11 years: Acyclovir 15 mg/kg/dose IV q8h ≥ 12 years: Acyclovir 10 mg/kg/dose IV q8h		For neonates: 21 days minimum (repeat HSV CSF PCR at end of treatment; if positive extend therapy by 1 week with repeat testing) Outside of neonatal period, duration can vary. Consult ID for recommendations.	Recommend ID Consult Ideal body weight (IBW) should be used for dosing in obese patients Neonatal HSV suppressive therapy: Acyclovir 300 mg/m^2/dose PO TID
Gastrointestinal/Abdominal [10-25]					
Appendicitis	Enteric Gram-negative bacilli *S. anginosus* group Anaerobes	Ceftriaxone 50 mg/kg/dose IV q24h (max: 2000 mg/dose) **PLUS** Metronidazole 30 mg/kg/dose IV q24h (max: 1500 mg/dose)	ALLERGY: Ciprofloxacin 10 mg/kg/dose IV q12h (max: 400 mg/dose) PLUS Metronidazole 30 mg/kg/dose IV q24h (max: 1500 mg/dose)	Antibiotics are not indicated post-operatively for uncomplicated appendicitis.	

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Button battery ingestion prophylaxis	*S. pyogenes* *S. anginosus* group *Haemophilus spp.* Oral anaerobes MRSA or MSSA Polymicrobial	***MOST BUTTON BATTERY INGESTIONS DO NOT REQUIRE ANTIMICROBIAL PROPHYLAXIS*** ANTIMICROBIAL PROPHYLAXIS MAY BE CONSIDERED FOR ADMITTED PATIENTS WITH EVIDENCE OF ESOPHAGEAL INJURY AND HIGH RISK FACTORS (SEE COMMENTS): Ampicillin/sulbactam 50mg/kg/dose ampicillin component IV q6h (max: 2000 mg/dose) OR Amoxicillin/clavulanate 20 mg/kg/dose amoxicillin component PO q12h using the 400 mg/5 mL oral suspension (max: see adult doses)	ALLERGY: Clindamycin 13 mg/kg/dose IV/PO q8h (max: 600 mg/dose)	3-5 days	Would consider broad spectrum antibiotic coverage in those patients who have been identified in studies to have highest risk of developing significant complications: ○ Ingested large-diameter lithium cells ≥ 20mm ○ Esophageal exposure time >2 hours ○ Children < 4 years of age ○ Unwitnessed ingestions (unknown time of exposure) Maximum adult doses for Amoxicillin/clavulanate in children weighing =/> 40 kg: 875 mg/125 mg PO BID using the 875 mg tablet or 400 mg/5 mL suspension OR 500 mg/125 mg PO TID using the 500 mg tablet or 250 mg/5 mL suspension
Cholangitis	Enteric Gram-negative bacilli *Enterococcus spp.* Anaerobes	Ceftazidime 50 mg/kg/dose IV q8h (max: 2000 mg/dose) +/- Metronidazole 10 mg/kg/dose IV q8h (max: 500 mg/dose) OR Piperacillin-Tazobactam 100 mg/kg/dose piperacillin component IV q6h (max: 4,000 mg/dose)	ALLERGY: Ciprofloxacin 10 mg/kg/dose IV q12h (max: 400 mg/dose) +/- Metronidazole 10 mg/kg/dose IV q8h (max: 500 mg/dose)		

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Clostridioides difficile infection **Defining Disease Severity:** NON-SEVERE: Positive *C. difficile* test and diarrhea with no manifestations of severe disease. SEVERE: Positive *C. difficile* test and diarrhea with at least one of the following: • WBC ≥15,000 cells/mm^3 • Increase in serum creatinine >50% from baseline FULMINANT: Severe disease plus any of the following: • Hypotension or shock • Toxic megacolon • Ileus • Colonic ischemia **ID consult recommended RECURRENCE: typically defined as a relapse of *C. difficile* symptoms within 2-8 weeks of successful treatment of initial episode.	*C. difficile*	Refer to Peds C*diff* Focused order set in EPIC NON-SEVERE (INITIAL EPISODE): Vancomycin 10 mg/kg/dose PO q6h (max 125 mg/dose) SEVERE (INITIAL EPISODE): Vancomycin 10 mg/kg/dose PO q6h (max 500 mg/dose) FULMINANT: Vancomycin 10 mg/kg/dose PO q6h (max 500 mg/dose) - Ileus: Add rectal vancomycin as retention enema q6h [a] PLUS Metronidazole 10 mg/kg/dose IV q8h (max 500 mg/dose) [a] NON-SEVERE (1ST OR SUBSEQUENT RECURRENCE): Vancomycin 10 mg/kg/dose PO q6h (max 125 mg/dose) OR Vancomycin taper and pulse [c] OR Fidaxomicin [d] ≥6 months to 5 years: 16 mg/kg/dose PO BID (max 200 mg/dose) ≥6 years: 200 mg PO BID SEVERE (1ST OR SUBSEQUENT RECURRENCE): Vancomycin 10 mg/kg/dose PO q6h (max 500 mg/dose) OR Vancomycin taper and pulse [c] OR Fidaxomicin [d] ≥6 months to 5 years: 16 mg/kg/dose PO BID (max 200 mg/dose) ≥6 years: 200 mg PO BID		10 days for all therapies except the vancomycin taper and pulse regimen 6-14 weeks for vancomycin taper and pulse	[a] Vancomycin enema volumes are age dependent • 1-3 years: 250 mg in 50 mL normal saline q6h • 4-9 years: 375 mg in 75 mL normal saline q6h • ≥10 years: 500 mg in 100 mL normal saline q6h [b] Efficacy of IV metronidazole is unclear. It may be use as an adjunct in severe or fulminant disease, particularly in the setting of critical illness and/or ileus, but should not be used as primary agent for treatment of *C. difficile* [c] Vancomycin PO taper/pulse: 10 mg/kg/dose PO q6h (max 125 mg/dose) for 10-14 days, then 10 mg/kg PO q12h (max 125 mg/dose) for 7 days, then 10 mg/kg PO q24h (max 125 mg/dose) for 7 days, and then 10 mg/kg PO q2-3 days (max 125 mg/dose) for 2–8 weeks. [d] Fidaxomicin considerations (order a la carte): • Please call ID if you think your patient is a good candidate for fidaxomicin as any PO vancomycin prior to receiving fidaxomicin may eliminate the benefit of fidaxomicin (narrower spectrum, less dysbiosis) • Not indicated for fulminant disease • Restricted to certain use criteria and requires an ID consult and second-sign approval. Typically reserved for patients with multiple risk factors for recurrent CDI or upon a recurrent CDI infection. • Insurance coverage is challenging in children. If initiated, start outpatient approval process if expecting discharge prior to course completion.

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Diagnosis	Common Pathogens	Preferred Empiric Drug(s)	Alternative Drug(s) for Allergy or Clinical Severity	Duration*	Comments
Diarrhea, infectious	*Aeromonas, Plesiomonas, Campylobacter, E. coli, Salmonella, Shigella, Yersinia* **Antibiotics should only be utilized for specific bacteria after a positive culture (see comments)**	<u>*SALMONELLA* <3 MONTHS OLD (WITHOUT MENINGITIS)</u>: Ceftriaxone 50 mg/kg/dose IV q24h (max: 2000 mg/dose)*	<u>ALLERGY</u>: Azithromycin PO: 10 mg/kg (max: 500 mg/dose) x 3 days If susceptible to ampicillin: Ampicillin 50 mg/kg/dose IV q6h (max: 2000 mg/dose) OR Amoxicillin 20 mg/kg/dose PO BID (max: 500 mg/dose)	7-10 days	Routine treatment for healthy children >3 months of age with uncomplicated gastroenteritis is not indicated except if caused by Shigella Routine antibiotic treatment of *E. coli* gastroenteritis is not indicated. Antimotility agents should not be used, because they have been shown to prolong symptomatology and may be associated with an increased risk of death. **Consult ID for antibiotic recommendations in patients < 1 month of age*
		<u>SHIGELLA</u>: Azithromycin 10 mg/kg PO daily (max: 500 mg/dose) OR Ceftriaxone 50 mg/kg/dose IV q24h (max: 2000 mg/dose)		3 days 2-5 days	
		<u>CAMPYLOBACTER if severe disease or immunocopromised</u>: Azithromycin 10 mg/kg/dose PO daily		3 days	
Intra-abdominal infection (Community-acquired)	Enteric Gram-negative bacilli Anaerobes	Ceftriaxone 50 mg/kg/dose IV q24h (max 2000 mg/dose) **PLUS** Metronidazole 10 mg/kg/dose IV q8h (max: 500 mg/dose)	<u>ALLERGY</u>: Ciprofloxacin 10 mg/kg/dose IV q12h (max: 400 mg/dose) **PLUS** Metronidazole 10 mg/kg/dose IV q8h (max: 500 mg/dose)		

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Necrotizing enterocolitis (NEC) / Spontaneous intestinal perforation (SIP)	Enteric Gram-negative bacilli, Polymicrobial, CoNS (very premature infants)	MODIFIED BELL'S STAGE I: Ampicillin PLUS Gentamicin MODIFIED BELL'S STAGE II: Ampicillin PLUS Gentamicin MODIFIED BELL'S STAGE III: Ampicillin PLUS Gentamicin PLUS Metronidazole (see Neonatal Dosing Guide)	IF H/O MRSA COLONIZATION/ INFECTION : Use Vancomycin in place of Ampicillin. De-escalate vancomycin to ampicillin after 48 hours if cultures are negative and clinical status is improving.	STAGE I: 2-3 days STAGE II: 7 days STAGE III: 10 days See Appendix 2 for Staging	If blood culture positive, a lumbar puncture is indicated and should be utilized in conjunction with speciation to determine duration of antibiotic therapy
Spontaneous bacterial peritonitis (SBP)	*S. pneumoniae* Enteric Gram-negative bacilli	Ceftriaxone 50 mg/kg/dose IV q24h (max: 2000 mg/dose)	ALLERGY: Piperacillin-Tazobactam 100 mg/kg/dose piperacillin component IV q6h (max: 4,000 mg/dose)		
Genitourinary Tract [26-33]					
Bacterial vaginosis	*G. vaginalis* *Ureaplasma* *Mycoplasma* Anaerobes	Metronidazole - Wt ≥45 kg: 500 PO BID - Wt <45 kg: 7.5 mg/kg PO BID (max: 500 mg/dose)		7 days	See latest CDC guidelines (2021)
Epididymitis	*N. gonorrhoeae* *C. trachomatis* Enteric Gram-negative bacilli (MSM)	Ceftriaxone - Wt ≤ 45 kg: 25-50 mg/kg IM/IV x1 dose (max: 250 mg/dose) - Wt > 45 kg and < 150 kg: 500 mg IM/IV x1 dose - Wt ≥ 150 kg: 1000 mg IM/IV x1 dose PLUS Doxycycline 2.2 mg/kg/dose PO q12h dose x 10 days (max: 100 mg/dose)			See CDC guidelines (2021)

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Genital Herpes	Herpes simplex virus (HSV)	ADOLESCENT/ADULT: FIRST EPISODE: Valacyclovir 20 mg/kg/dose PO BID (max: 1g/dose) OR Acyclovir 20 mg/kg/dose PO TID (max: 400 mg/dose) RECURRENT EPISODES: Valacyclovir 20 mg/kg PO daily (max: 1000 mg/dose) OR Acyclovir - < 12 years: 20 mg/kg/dose TID (max: 400 mg/dose) - ≥ 12 years: 800 mg PO BID		FIRST EPISODE: 7-10 days RECURRENT EPISODE: 5 days	See CDC guidelines (2021)
Pelvic inflammatory disease	*N. gonorrhoeae* *C. trachomatis* Enteric Gram-negative bacilli Anaerobes	OUTPATIENT: **Ceftriaxone** -Wt ≤45 kg: 25-50 mg/kg IM/IV x1 dose (max: 250 mg/dose) -Wt >45 kg and < 150 kg: 500 mg IM/IV x1 dose -Wt ≥150 kg: 1000 mg IM/IV x1 dose PLUS **Doxycycline** 2.2 mg/kg/dose PO q12h dose (max: 100 mg/dose) PLUS **Metronidazole** -Wt ≥45 kg: 500 PO BID -Wt <45 kg: 7.5 mg/kg/dose PO BID (max: 500 mg/dose) INPATIENT: Ceftriaxone 50 mg/kg IV q24h (max: 1000 mg/dose) PLUS Doxycycline 2.2 mg/kg PO q12h (max: 100 mg/dose) PLUS Metronidazole -Wt ≥45 kg: 500 PO BID -Wt <45 kg: 7.5 mg/kg PO BID (max: 500 mg/dose)	ALTERNATIVE FOR PATIENTS UNABLE TO TOLERATE METRONIDAZOLE DUE TO SEVERE NAUSEA/VOMITING: Cefoxitin 40 mg/kg/dose IV q6h (max: 2000 mg/dose) PLUS Doxycycline 2.2 mg/kg/dose PO q12h (max: 100 mg/dose) ALLERGY: Clindamycin 13 mg/kg/dose IV q8h (max: 900 mg/dose) PLUS Gentamicin (see dosing guide)	14 days	For inpatients, after clinical improvement, transition to oral therapy with doxycycline and metronidazole at doses indicated in previous column. See CDC guidelines (2021)

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Diagnosis	Common Pathogens	Preferred Empiric Drug(s)	Alternative Drug(s) for Allergy or Clinical Severity	Duration*	Comments
Sexually transmitted infection (STI)	*N. gonorrhoeae*	**Ceftriaxone** -Wt ≤ 45 kg: 25-50 mg/kg IM/IV x1 dose (max: 250 mg/dose) -Wt > 45 kg and < 150 kg: 500 mg IM/IV x1 dose -Wt ≥ 150 kg: 1000 mg IM/IV x1 dose	SEVERE CEPHALOSPORIN ALLERGY: Gentamicin 240 mg IM x1 dose PLUS Azithromycin 2 g PO x1 dose	Single dose	See CDC guidelines (2021)
	C. trachomatis	NOT RECTAL: Azithromycin 1g PO x1 dose[1] OR Doxycycline 100 mg PO BID x7 days RECTAL CHLAMYDIA: Doxycycline 100 mg PO BID x 7 days[2]	[1]AZITHROMYCIN TREATMENT FAILURE: Doxycycline 100 mg PO BID x 7 days [2]Azithromycin 1000mg x1 dose can be considered if there are significant barriers to adherence. Follow-up for retesting recommended if azithromycin is used.	Azithromycin: 1 day Doxycycline: 7 days	See CDC guidelines (2021) **CDC now recommends doxycycline x7 days first-line for *C. trachomatis*. This is based on compelling data mainly in rectal chlamydia. Due to adherence concerns and lack of data for urethritis/ cervicitis, we recommend azithromycin first-line for non-rectal chlamydia.
	Syphilis	PRIMARY / SECONDARY / EARLY LATENT (<1 YR DURATION): Penicillin G Benzathine 50,000 units/kg/dose IM x 1 dose (max: 2.4 million units/dose) LATE LATENT / LATENT WITH UNKNOWN DURATION / TERTIARY WITH NORMAL CSF: Penicillin G Benzathine 50,000 units/kg/dose IM once weekly x 3 doses (max: 2.4 million units/dose) NEUROSYPHILIS/ OCULAR: Penicillin G (Aqueous/Parenteral) 50,000 units/kg/dose IV q4h (max: 4 million units/dose) CONGENITAL SYPHILIS:	ALLERGY (IN NON-PREGNANT INDIVIDUALS): Doxycycline 100mg PO BID x 14 days	10 days	See CDC guidelines (2021)

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Diagnosis	**Common Pathogens**	**Preferred Empiric Drug(s)**	**Alternative Drug(s) for Allergy or Clinical Severity**	**Duration***	**Comments**
Sexually transmitted infection (STI)	Syphilis, continued	CONGENITAL SYPHILIS: Penicillin G (Aqueous/Parenteral) ≤ 7 days of age: 50,000 units/kg/dose IV q12h 8 – 28 days of age: 50,000 units/kg/dose IV q8h ≥ 1 month of age: 50,000 units/kg/dose IV q4-6h			
	Trichomoniasis	<45 kg: Metronidazole 15 mg/kg/dose PO TID x 7 days (max: 2000 mg/day) >/= 45 kg: Women: Metronidazole 500 mg PO BID x 7 days Men: Metronidazole 2000 mg PO x1 dose	For adolescent women with significant barriers to adherence, can consider metronidazole 2000 mg PO as a single dose		See CDC guidelines (2021)
Urinary tract infection See Guidelines for the Evaluation and Management of Urinary Tract Infections at SLCH on the Antimicrobial Guidebook	Enteric Gram-negative bacilli	Cephalexin </= 15 years old: 25 mg/kg/dose PO q8h (max: 500 mg/dose) >15 years old: Cystitis: 500 mg PO q12h Pyelonephritis: 500 mg PO q8h Cefazolin 25 mg/kg/dose IV q8h (max: 1000 mg/dose) Ceftriaxone 50 mg/kg/dose IV q24h (max: 2000 mg/dose)	For alternative treatment options see Guidelines for the Evaluation and Management of Urinary Tract Infections at SLCH.	CYSTITIS: 5 days (If ciprofloxacin or TPM/SMX is chosen, a shorter duration of 3 days is appropriate for cystitis) PYELONEPHRITIS: 7 days	Empiric antibiotic choices should take into account previous urine cultures

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Head/Ears/Eyes/Nose/Throat (HEENT) Infections [34-41]					
Acute otitis media	*S. pneumoniae* *M. catarrhalis* *H. influenzae* *S. pyogenes*	Amoxicillin 45 mg/kg/dose PO q12h (max: 2000 mg/dose)	ALLERGY: **Cefdinir 7 mg/kg/dose PO q12h (max: 300 mg/dose)** OR Cefdinir 14 mg/kg/dose PO q24h (max: 600 mg/dose)	< 2 yrs or severe symptoms (any age): 10 days ≥ 2 yrs with mild-moderate symptoms: 5 days PMID: 37855227	Consider high-dose amoxicillin/clavulanate if treated with amoxicillin for AOM in past 30 days or with concomitant conjunctivitis Amoxicillin/clavulanate 45 mg/kg/dose amoxicillin component PO q12h using the 600 mg/5 mL oral suspension only (max: see adult doses) Maximum adult dose for Amoxicillin/clavulanate in children weighing =/> 40 kg: 875 mg/125 mg PO BID using the 875 mg tablet OR the 400 mg/5 mL suspension
Dental abscess	*Viridans Streptococci, Eikenella* sp., oral anaerobes (i.e. *Peptostreptococcus, Actinomyces, Veillonella)* Amoxicillin and ampicillin alone cover the oral anaerobes of interest listed above	Amoxicillin 10 mg/kg/dose PO q8h hours (max: 500 mg/dose) OR Ampicillin 50 mg/kg/dose IV q6h (max: 2000 mg/dose) IF NO IMPROVEMENT ON AMOXICILLIN >48 HOURS: Amoxicillin/clavulanate 20 mg/kg/dose amoxicillin component PO q12h using the 400 mg/5 mL oral suspension (max: see adult doses) OR Ampicillin/sulbactam 50 mg/kg/dose ampicillin component IV q6h (max: 2000 mg/dose)	ALLERGY: Clindamycin 13mg/kg/dose IV/PO q8h (max: 450-600 mg/dose) OR Azithromycin 10 mg/kg PO on day 1 (max: 500 mg/dose), followed by 5 mg/kg PO daily on days 2-5 (max: 250 mg/dose) OR IF NO SEVERE IgE-MEDIATED REACTION TO PENICILLINS can also use: Cephalexin 25 mg/kg/dose PO q12h (max: 500 mg/dose)	3-7 days total 10 days in the absence of source control (if that would have been necessary), or if source control is delayed until after treatment course completed	Maximum adult doses for Amoxicillin/clavulanate in children weighing =/> 40 kg: 875 mg/125 mg PO BID using the 875 mg tablet or 400 mg/5 mL suspension OR 500 mg/125 mg PO TID using the 500 mg tablet or 250 mg/5 mL suspension Resource: Clinical practice guideline for urgent management of pulpal- and periapical-related dental pain and intraoral swelling – report from the ADA https://doi.org/10.1016/j.adaj.2019.08.020

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Diagnosis	Common Pathogens	Preferred Empiric Drug(s)	Alternative Drug(s) for Allergy or Clinical Severity	Duration*	Comments
Mandible fracture prophylaxis	*Viridans Streptococci, Neisseria* spp., *Eikenella* spp., Anaerobes	INPATIENT: Ampicillin/sulbactam 50 mg/kg/dose ampicillin component IV q6h (max: 2000 mg/dose) OUTPATIENT: Amoxicillin/clavulanate 20 mg/kg/dose amoxicillin component PO q12h using the 400 mg/5 mL oral suspension (max: see adult doses)	ALLERGY: Clindamycin 13mg/kg/dose IV/PO q8h (max: 600 mg/dose)	Antibiotic prophylaxis should not extend >24 hours after skin closure for open fractures.	RISK FACTORS FOR INFECTION: • Delayed repair (> 36 hours) • Comminuted mandible fracture • Unstable repair • Poor dentition / oral mucosal • More extensive intraoral mucosal or external (skin / subQ / muscle) exposure • Pathologic fracture • Radiation therapy • Immunocompromised
Mastoiditis	*S. pneumoniae* *S. pyogenes* *H. influenzae* MSSA or MRSA	ACUTE MASTOIDITIS: Ceftriaxone 50 mg/kg/dose IV q24h (max: 2000 mg/dose) OR Ampicillin/sulbactam 50 mg/kg/dose ampicillin component IV q6h (max: 2000 mg/dose) OR Amoxicillin/clavulanate 45 mg/kg/dose amoxicillin component PO q12h using the 600 mg/5 mL oral suspension only (max: see adult doses) CHRONIC MASTOIDITIS, RECURRENT AOM: Cefepime 50 mg/kg/dose IV q8h (max 2000 mg/dose) INTRACRANIAL EXTENSION: Ceftriaxone 50 mg/kg/dose IV q12h (max 2000 mg/dose) **PLUS** Vancomycin (see dosing guide)	ALLERGY: Clindamycin 13 mg/kg/dose IV q8h (max: 600 mg/dose) ALLERGY & INTRACRANIAL EXTENSION: Meropenem 40 mg/kg/dose IV q8h (max: 2000 mg/dose) **PLUS** Vancomycin (see dosing guide)		Consider ID consult Vancomycin trough goal 15-20 mcg/mL if concern for CNS extension Maximum adult doses for Amoxicillin/clavulanate in children weighing =/> 40 kg using **standard dosing**: 875 mg/125 mg PO BID using the 875 mg tablet or 400 mg/5 mL suspension OR 500 mg/125 mg PO TID using the 500 mg tablet or 250 mg/5 mL suspension Maximum adult doses for Amoxicillin/clavulanate in children weighing =/>40 kg using **high-dose regimen** (better S. pneumo target attainment potentially): 2000 mg/125 mg PO BID using the 1000 mg XR tablet or 600 mg/5 mL ES suspension

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Diagnosis	Common Pathogens	Preferred Empiric Drug(s)	Alternative Drug(s) for Allergy or Clinical Severity	Duration*	Comments
Orbital cellulitis (post-septal)	*S. pneumoniae* *Haemophilus* spp. *S. pyogenes* MRSA or MSSA Anaerobes	Ampicillin/sulbactam 50 mg/kg/dose ampicillin component IV q6h (max: 2000 mg/dose) OR Amoxicillin/clavulanate 45 mg/kg/dose amoxicillin component PO q12h using the 600 mg/5 mL oral suspension only (max: see adult doses) IF H/O MRSA COLONIZATION/ INFECTION OR HOUSEHOLD CONTACT WITH MRSA: Clindamycin 13mg/kg/dose IV/PO q8h (max: 600 mg/dose) IF TOXIC, CONCERN FOR SIGHT-THREATENING INFECTION OR CNS EXTENSION: Ceftriaxone 50 mg/kg/dose IV q12h (max: 2000 mg/dose) PLUS Vancomycin (see dosing guide)	ALLERGY: Clindamycin 13mg/kg/dose IV/PO q8h (max: 600mg/dose) CONCERN FOR SIGHT-THREATENING INFECTION OR CNS EXTENSION & CEPHALOSPORIN ALLERGY: Meropenem 40 mg/kg/dose IV q8h (max: 2000 mg/dose) PLUS Vancomycin (see dosing guide)	14-21 days	Consider ID consult Vancomycin trough goal 15-20 mcg/mL if concern for CNS extension Maximum adult doses for Amoxicillin/clavulanate in children weighing =/> 40 kg: For periorbital cellulitis: 875 mg/125 mg PO BID using the 875 mg tablet or 400 mg/5 mL suspension OR For orbital cellulitis: 2000 mg/125 mg PO BID using the 1000 mg XR tablet or 600 mg/5 mL ES suspension

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Diagnosis	Common Pathogens	Preferred Empiric Drug(s)	Alternative Drug(s) for Allergy or Clinical Severity	Duration*	Comments
Periorbital cellulitis (pre-septal)	*S. pyogenes* MRSA or MSSA	IF ORBITAL CELLULITIS NOT RULED OUT: Ampicillin/sulbactam 50 mg/kg/dose ampicillin component IV q6h (max: 2000 mg/dose) OR Amoxicillin/clavulanate 45 mg/kg/dose amoxicillin component PO q12h using the 600 mg/5 mL oral suspension only (max: see adult doses) IF ORBITAL CELLULITIS CAN BE RULED OUT: Cefazolin 33 mg/kg/dose IV q8h (max: 2 gm/dose) OR Cephalexin 25 mg/kg/dose PO q8h (max: 500 mg/dose)	ALLERGY: Clindamycin 13mg/kg/dose IV/PO q8h (max: 600mg/dose)	5-7 days Switch to oral therapy with 24 hours of clinical improvement	Maximum adult doses for Amoxicillin/clavulanate in children weighing =/> 40 kg: For periorbital cellulitis: 875 mg/125 mg PO BID using the 875 mg tablet or 400 mg/5 mL suspension OR For orbital cellulitis: 2000 mg/125 mg PO BID using the 1000 mg XR tablet or 600 mg/5 mL ES suspension
Group A Streptococcus Pharyngitis (GAS)	Group A *Streptococcus*	Amoxicillin 50 mg/kg/dose PO once daily (max: 1000 mg/dose) **Penicillin G Benzathine is currently NOT recommended** for GAS pharyngitis – BJC is experiencing a critical shortage and supply should be reserved for the treatment of syphilis	ALLERGY: Cephalexin 20 mg/kg/dose twice daily (max: 500 mg/dose) if non-anaphylaxis reaction to amoxicillin/penicillin OR Clindamycin 7 mg/kg/dose three times daily (max: 300 mg/dose)	10 days	

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Diagnosis	Common Pathogens	Preferred Empiric Drug(s)	Alternative Drug(s) for Allergy or Clinical Severity	Duration*	Comments
Retro- or para- pharyngeal abscess	*S. pyogenes* *S. anginosus* group *Haemophilus* spp. Oral anaerobes Polymicrobial MRSA or MSSA	Amoxicillin/clavulanate 20 mg/kg/dose amoxicillin component PO q12h using the 400 mg/5 mL oral suspension (max: see adult doses) OR Ampicillin/sulbactam 50 mg/kg/dose ampicillin component IV q6h (max: 2000 mg/dose) IF TOXIC: Vancomycin (see dosing guide) **PLUS** Ceftriaxone 50 mg/kg/dose IV q24h (max: 2000 mg/dose)	ALLERGY: Clindamycin 13mg/kg/dose IV q8h (max: 600 mg/dose)	10-14 days	Maximum adult doses for Amoxicillin/clavulanate in children weighing =/> 40 kg: 875 mg/125 mg PO BID using the 875 mg tablet or 400 mg/5 mL suspension OR 500 mg/125 mg PO TID using the 500 mg tablet or 250 mg/5 mL suspension
Sinusitis, acute bacterial	*S. pneumoniae* *M. catarrhalis* *H. influenzae* *S. pyogenes*	Amoxicillin 45mg/kg/dose PO q12h (max: 2000 mg/dose) OR Amoxicillin/clavulanate 45 mg/kg/dose amoxicillin component PO q12h using the 600 mg/5 mL oral suspension only (max: see adult doses)	ALLERGY OR TREATMENT FAILURE: Clindamycin 13 mg/kg/dose PO TID (max: 600 mg/dose) OR Levofloxacin 6 mo-4 years: 10 mg/kg/dose IV/PO q12h ≥ 5 years: 10 mg/kg/dose IV/PO q24h (max: 750 mg/dose)	5-7 days	Maximum adult doses for Amoxicillin/clavulanate in children weighing =/>40 kg: 875 mg/125 mg PO BID using the 875 mg tablet or 400 mg/5 mL suspension OR 500 mg/125 mg PO TID using the 500 mg tablet or 250 mg/5 mL suspension Guidelines: AAP: *Pediatrics* (2013) 132 (1): e262–e280. https://doi.org/10.1542/peds.2013-1071 IDSA: *Clinical Infectious Diseases*, Volume 54, Issue 8, 15 April 2012, Pages e72–e112. https://doi.org/10.1093/cid/cis370

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Diagnosis	Common Pathogens	Preferred Empiric Drug(s)	Alternative Drug(s) for Allergy or Clinical Severity	Duration*	Comments
Tonsillar or peritonsillar abscess	*S. pyogenes* *S. anginosus* group Oral anaerobes Polymicrobial	Ampicillin/sulbactam 50 mg/kg/dose ampicillin component IV q6h (max: 2000 mg/dose) OR Amoxicillin/clavulanate 20 mg/kg/dose amoxicillin component PO q12h using the 400 mg/5 mL oral suspension (max: see adult doses)	ALLERGY: Clindamycin 13mg/kg/dose PO/IV q8h (max: 600 mg/dose)	10-14 days Switch to oral therapy with 24 hours of clinical improvement	Maximum adult doses for Amoxicillin/clavulanate in children weighing =/> 40 kg: 875 mg/125 mg PO BID using the 875 mg tablet or 400 mg/5 mL suspension OR 500 mg/125 mg PO TID using the 500 mg tablet or 250 mg/5 mL suspension
Respiratory Infections [8,42-47]					
Aspiration pneumonia* ***True aspiration pneumonia differs from aspiration pneumonitis.*** Aspiration pneumonitis is a chemical reaction that causes lung irritation. Patients can appear septic & initial chest imaging is often abnormal, but patients improve rapidly within 24-48 hours. Antibiotics are not indicated. Of note, aspiration of gastric contents is often sterile due to high acidity. Enteric anaerobes cannot survive in the aerophilic environment of the lungs unless it creates a walled-off abscess.	Oral flora, including oral anaerobes	OUTPATIENT: Amoxicillin/clavulanate 45 mg/kg/dose amoxicillin component PO q12h using the 600 mg/5 mL oral suspension (max: see adult doses) INPATIENT: Ampicillin/sulbactam 50 mg/kg/dose ampicillin component IV q6h (max: 2000 mg/dose) OR Ceftriaxone 50 mg/kg IV q24h (max: 2000 mg/dose)	ALLERGY: Clindamycin 13mg/kg/dose PO/IV q8h (max: 600 mg/dose)	5-7 days	Maximum adult dose for Amoxicillin/clavulanate in children weighing =/> 40 kg: 875 mg/125 mg PO BID using the 875 mg tablet or 400 mg/5 mL suspension

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Diagnosis	Common Pathogens	Preferred Empiric Drug(s)	Alternative Drug(s) for Allergy or Clinical Severity	Duration*	Comments
Community acquired pneumonia (CAP) (uncomplicated)	*S. pneumoniae* *Mycoplasma pneumoniae*	Amoxicillin 45 mg/kg/dose PO q12h (max: 2000 mg/dose) OR if cannot tolerate PO, Ampicillin 50 mg/kg/dose IV q6h (max: 2000 mg/dose) IF ATYPICAL PNEUMONIA SUSPECTED: ADD Azithromycin: 10 mg/kg PO on day 1 (max: 500 mg/dose), followed by 5 mg/kg PO daily on days 2-5 (max: 250 mg/dose)	ALLERGY: Ceftriaxone 50 mg/kg/dose IV q24h (max: 2000 mg/dose) **OR** Clindamycin 13mg/kg/dose IV/PO q8h (max: 600 mg/dose) **OR** Levofloxacin 6 mo-4 years: 10 mg/kg/dose IV/PO q12h ≥ 5 years: 10 mg/kg/dose IV/PO q24h (max: 750 mg/dose) ALTERNATIVES FOR ATYPICA PNEUMONIA: Doxycycline 2.2 mg/kg/dose PO q12h **OR** Levofloxacin (dosing above)	5 days	Children receiving antibiotics outpatient that are being admitted for uncomplicated CAP should still be started on first-line amoxicillin or ampicillin
CAP (complicated)	*S. pneumoniae* *S. pyogenes* MSSA or MRSA	Ceftriaxone 50 mg/kg/dose IV q24h (max: 2000 mg/dose)	IF TOXIC OR H/O MRSA COLONIZATION/ INFECTION: Ceftriaxone 50 mg/kg/dose IV q24h (max: 2000 mg/dose) **PLUS** Vancomycin (see dosing guide)		Consider ID Consult Complicated as defined by parapneumonic effusion, empyema, or necrotizing pneumonia. Obtain MRSA nasal swab if initiating anti-MRSA therapy
Hospital/Ventilator associated pneumonia (HAP/VAP)	Gram-negative organisms *S. aureus*	Cefepime 50 mg/kg/dose IV q8h (max: 2000 mg/dose)	IF TOXIC OR H/O MRSA COLONIZATION/ INFECTION: **ADD** Vancomycin (see dosing guide)	7 days	For HAP in previously healthy patient, consider Ceftriaxone. Consider modifying empiric antibiotics to include coverage of previous tracheal aspirate cultures Consider obtaining MRSA nasal swab if initiating anti-MRSA therapy if unable to obtain tracheal aspirate culture

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Diagnosis	Common Pathogens	Preferred Empiric Drug(s)	Alternative Drug(s) for Allergy or Clinical Severity	Duration*	Comments
Influenza	Influenza	TREATMENT: Oseltamivir Neonate: PMA < 38 weeks: 1 mg/kg PO q12h PMA 38-40 weeks: 1.5 mg/kg PO q12h PMA > 40 weeks: 3 mg/kg PO q12h Infants/Children < 1 year: 3 mg/kg PO q12h Children 1-12 years: ≤ 15 kg: 30 mg PO q12h 16-23 kg: 45 mg PO q12h 24-40 kg: 60 mg PO q12h >40 kg: 75 mg PO q12h >12 years: 75 mg PO BID PROPHYLAXIS: Oseltamivir 3 months-1 year: 3 mg/kg PO once daily Children 1-12 years: ≤ 15 kg: 30 mg PO once daily 16-23 kg: 45 mg PO once daily 24-40 kg: 60 mg PO once daily >40 kg: 75 mg PO once daily >12 years: 75 mg PO once daily		TREATMENT: 5 days PROPHYLAXIS: 7 days	Regardless of duration of symptoms, treatment is recommended for patients with severe influenza requiring hospitalization and for those at high risk of complications. Treatment may be considered for low-risk outpatients if initiated within 48 hours of illness onset. For more information, see the CDC guidance for healthcare professionals. PMA = Post Menstrual Age

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Diagnosis	Common Pathogens	Preferred Empiric Drug(s)	Alternative Drug(s) for Allergy or Clinical Severity	Duration*	Comments
Tracheitis (intubated/tracheostomy patient)	Gram-negative organisms *S. aureus*	Cefepime 50 mg/kg/dose IV q8h (max: 2000 mg/dose)	ALLERGY: Ciprofloxacin 10 mg/kg/dose PO q12h (max: 500 mg/dose) IF TOXIC: ADD Vancomycin (see dosing guide)	5 days	Empiric antibiotics should take into consideration previous tracheal aspirate cultures
Tracheitis (non-intubated following croup-like illness)	MSSA or MRSA *S. pyogenes* *S. pneumoniae* *H. influenzae*	Vancomycin (see dosing guide) **PLUS** Ceftriaxone 50 mg/kg/dose IV q24h (max: 2000 mg/dose)			Recommend ID consult
Skin and Soft Tissue [48-55]					
Cellulitis (nonpurulent)	*S. pyogenes* MSSA MRSA	Cephalexin 25 mg/kg/dose PO q12h (max: 500 mg/dose) OR Cefazolin 33 mg/kg/dose IV q8h (max: 2 gm/dose)	ALLERGY: Clindamycin 13mg/kg/dose IV/PO q8h (max: 450 mg/dose) IF TOXIC: Vancomycin (see dosing guide)	5 days	
Cellulitis/Abscess (purulent)	MSSA MRSA *S. pyogenes*	Cephalexin 25 mg/kg/dose PO q12h (max: 500 mg/dose) OR Cefazolin 33 mg/kg/dose IV q8h (max: 2 gm/dose) IF RISK FACTORS FOR MRSA PRESENT: Clindamycin 13mg/kg/dose IV/PO q8h (max: 450 mg/dose) OR TMP/SMX 5 mg/kg/dose trimethoprim component IV/PO q12h (max: 800 mg SMX/160 mg TMP per dose[a]) ***See right hand column for further management considerations**	ALLERGY: Doxycycline 2.2 mg/kg/dose PO q12h dose (max: 100 mg/dose) IF TOXIC: Vancomycin (see dosing guide)	5 days	*For purulent SSTI, incision and drainage (I&D) is indicated if able. If performed, send cultures. *When choosing an empiric antibiotic regimen, consider prior culture results and prior use of antibiotics, and see antibiogram for hospital-acquired and community-acquired *S. aureus* susceptibility at SLCH. [a] If BMI ≥ 30 in adolescents and adults, consider max dose of 1600 mg SMX/ 320 mg TMP/dose (i.e. double-strength tablet)

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Diagnosis	Common Pathogens	Preferred Empiric Drug(s)	Alternative Drug(s) for Allergy or Clinical Severity	Duration*	Comments
Human bite	*E. corrodens* Oral anaerobes Polymicrobial *Streptococcus* spp. MSSA or MRSA	Amoxicillin/clavulanate <3 months: 15 mg/kg/dose amoxicillin component PO q12h using the 250 mg/5 mL oral suspension only ≥ 3 months: 20 mg/kg/dose amoxicillin component PO q12h using the 400 mg/5 mL suspension or 400 mg chewable tablet (max: see adult doses) OR Ampicillin/sulbactam 50mg/kg/dose ampicillin component IV q6h (max: 2000 mg/dose)	ALLERGY: Clindamycin 13 mg/kg/dose PO q8h (max: 450 mg/dose) PLUS TMP/SMX 5 mg/kg/dose trimethoprim component PO q12h (max: 800 mg SMX/160 mg TMP per dose[a])	Prophylaxis: 3 days Infected: 5-7 days PROPHYLAXIS INDICATIONS: - Moderate or severe bite wounds, especially if edema or crush injury is present - Puncture wounds, especially if penetration of bone, tendon sheath, or joint has occurred - Deep or surgically closed facial bite wounds - Hand and foot bite wounds - Genital area bite wounds - Wounds in immunocompromised and asplenic patients - Cat bite wounds	Verify tetanus vaccine status. See the Red Book Tetanus Section, Table 3.68, for recommendations For animal bites, assess rabies risk Maximum adult doses for amoxicillin/clavulanate: 875 mg/125 mg PO BID OR 500 mg/125 mg PO TID [a] If BMI ≥ 30 in adolescents and adults, consider max dose of 1600 mg SMX/ 320 mg TMP/dose (i.e. double-strength tablet)
Animal bite	*P. multocida* Oral anaerobes *E. corrodens* *Capnocytophaga* spp. *Streptococcus* spp. MSSA or MRSA				
Lymphadenitis, suppurative	MSSA or MRSA Group A *Streptococcus*	Cephalexin 25 mg/kg/dose PO q12h (max: 500 mg/dose) OR Cefazolin 33 mg/kg/dose IV q8h (max: 2 gm/dose) IF RISK FACTORS FOR MRSA PRESENT: Clindamycin 13mg/kg/dose IV/PO q8h (max: 450 mg/dose) OR TMP/SMX 5 mg/kg/dose trimethoprim component IV/PO q12h (max: 800 mg SMX/160 mg TMP per dose[a])	ALTERNATIVE: Amoxicillin/clavulanate 20 mg/kg/dose amoxicillin component PO q12h using the 400 mg/5 mL suspension or 400 mg chewable tablet (max: see adult doses) OR Ampicillin/sulbactam 50mg/kg/dose ampicillin component IV q6h (max: 2000 mg/dose) OR	7 days	Bilateral infection likely to be a viral process Maximum adult doses for Amoxicillin/clavulanate in children weighing =/> 40 kg: 875 mg/125 mg PO BID using the 875 mg tablet or 400 mg/5 mL suspension OR 500 mg/125 mg PO TID using the 500 mg tablet or 250 mg/5 mL suspension [a] If BMI ≥ 30 in adolescents and adults, consider max dose of 1600 mg SMX/ 320 mg TMP/dose (i.e. double-strength tablet)

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Diagnosis	Common Pathogens	Preferred Empiric Drug(s)	Alternative Drug(s) for Allergy or Clinical Severity	Duration*	Comments
Necrotizing fasciitis	*S. pyogenes* MSSA or MRSA Polymicrobial	Vancomycin (see dosing guide) **PLUS** Cefepime 50 mg/kg/dose IV q8h (max: 2000 mg/dose) **PLUS** Clindamycin 13mg/kg/dose IV q8h (max: 600-900 mg/dose)			Obtain Infectious Diseases and Surgery Consults
Pyomyositis	MSSA or MRSA *S. pyogenes*	Cefazolin 33 mg/kg/dose IV q8h (max: 2000 mg/dose) H/O MRSA COLONIZATION/ INFECTION: Clindamycin 13mg/kg/dose IV/PO q8h (max: 600 mg/dose)	IF TOXIC: Vancomycin (see dosing guide)		
Staphylococcal scalded skin	Predominantly MSSA, or rarely MRSA	Cefazolin 33 mg/kg/dose IV q8h (max: 2000 mg/dose) OR Cephalexin 25 mg/kg/dose PO q12h (max: 500 mg/dose)	H/O MRSA COLONIZATION/ INFECTION: Clindamycin 13mg/kg/dose IV/PO q8h (max: 600 mg/dose)	5-7 days	
Miscellaneous [9,56,57]					
Febrile neutropenia (hematology/oncology patients) Does not apply to non-hematology/oncology patients who are febrile and neutropenic for other reasons (e.g. viral infection)	Gram-positive pathogens (including *S. aureus*, CoNS, *Streptococcus* spp.) Enteric Gram-negative bacilli (including *P. aeruginosa*)	Cefepime 50mg/kg/dose IV q8h (max: 2000 mg/dose)	IF TOXIC, SEVERE PNEUMONIA, SEVERE MUCOSITIS, OR CELLULITIS WITH RISK FACTORS FOR MRSA: Add Vancomycin (see dosing guide) IF ABDOMINAL SYMPTOMS/TYPHLITIS: Add Metronidazole 10 mg/kg/dose IV/PO q8h (max: 500 mg/dose)		

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Diagnosis	Common Pathogens	Preferred Empiric Drug(s)	Alternative Drug(s) for Allergy or Clinical Severity	Duration*	Comments
Lemierre's Syndrome	*Fusobacterium necrophorum* *Bacteroides* spp. *Peptostreptococcus* *S. aureus* *Streptococcus* spp.	Ceftriaxone 50 mg/kg/dose IV q24h (max: 2000 mg/dose **PLUS** Metronidazole 10 mg/kg/dose IV q8h (max: 500 mg/dose) IF TOXIC: **ADD** Vancomycin (see dosing guide)			Recommend ID Consult
Catheter-associated blood stream infection (CLABSI)	MSSA or MRSA Coagulase-negative *Staphylococcus* (CoNS) Enteric Gram-negative bacilli	Cefepime 50 mg/kg/dose IV q8h (max: 2000 mg/dose)	IF TOXIC OR H/O MRSA COLONIZATION / INFECTION: **ADD** Vancomycin (see dosing guide)		Recommend ID Consult
R/O Sepsis 0-21 days (no central lines and no concern for meningitis) If concerned for meningitis, refer to meningitis section	*S. agalactiae (GBS)* *E. coli* *L. monocytogenes*	Admission from community: Ampicillin PLUS Ceftazidime OR Ceftriaxone* (see column to the right) NICU: Ampicillin PLUS Gentamicin (see Neonatal Dosing Guide)	*Patients meeting the following criteria may receive Ampicillin PLUS Ceftriaxone: • ≥ 7 days of age • Corrected (current) gestational age ≥ 35 weeks • Not currently receiving calcium containing solutions or parenteral nutrition • Total Serum Bilirubin (Tbili) < 5 mg/dL [A] • Albumin within normal limits [A]		**In all settings, ceftazidime or ceftriaxone preferred to gentamicin in children with known or suspected structural kidney disease.** [A] In patients who qualify for ceftriaxone based on age and corrected GA, it is not always necessary to wait for Tbili and albumin to result before placing order. In most, the bilirubin-albumin binding capacity has matured, but clinical judgment is warranted.
R/O Sepsis > 21 days (no central lines and no concern for meningitis) If concerned for meningitis, refer to meningitis section	*S. agalactiae* (GBS) *S. pneumoniae* *E. coli* *N. meningitidis* *S. pyogenes*	Ceftriaxone 50 mg/kg/dose q24h (max: 2000 mg/dose)	IF TOXIC OR H/O MRSA COLONIZATION/ INFECTION: ADD Vancomycin (see dosing guide) IF TOXIN-MEDIATED INFECTION SUSPECTED: ADD Clindamycin 13mg/kg/dose IV q8h (max: 600 mg/dose)		

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Diagnosis	Common Pathogens	Preferred Empiric Drug(s)	Alternative Drug(s) for Allergy or Clinical Severity	Duration*	Comments
Sickle Cell Disease with Fever	*S. pneumoniae* Enteric Gram-negative organisms Salmonella *S. aureus* *Mycoplasma*	Ampicillin/sulbactam 50mg/kg/dose ampicillin component IV q6h (max: 2000 mg/dose) OR **Ceftriaxone 50 mg/kg/dose IV q24h (max: 2000 mg/dose) **(see comments section)**	IF ACUTE CHEST SYNDROME SUSPECTED: **ADD** Azithromycin: 10 mg/kg PO on day 1 (max: 500 mg/dose), followed by 5 mg/kg PO daily on days 2-5 (max: 250 mg/dose) IF TOXIC OR H/O MRSA COLONIZATION/ INFECTION: **ADD** Vancomycin (see dosing guide)		****Ceftriaxone may increase the risk of severe hemolysis in patients with sickle cell disease**
Tickborne Infections	*Ehrlichia* *Rickettsia*	Doxycycline 2.2 mg/kg/dose PO q12h (max: 100 mg/dose)			
Toxic shock syndrome	*S. pyogenes* *S. aureus*	Vancomycin (see dosing guide) **PLUS** Ceftriaxone 50 mg/kg/dose IV q12h (max: 2000 mg/dose) **PLUS** Clindamycin 13 mg/kg/dose IV q8h (max: 600 mg/dose)			Recommend ID Consult

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APPENDIX 1: PEDIATRIC DOSING RECOMMENDATIONS FOR VACOMYCIN AND AMINOGLYCOSIDES

For neonate-specific dosing recommendations, see Neonatal Dosing Guide

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Vancomycin Pediatric Dosing and Goal Troughs:

VANCOMYCIN EMPIRIC PEDIATRIC DOSING RECOMMENDATIONS (Patients previously therapeutic on vancomycin should be restarted on that dose as appropriate)	
< 3 months	15 mg/kg/dose q8h
3–11 months	15 mg/kg/dose q6h
1–8 years	20 mg/kg/dose q6h
9–13 years	20 mg/kg/dose q8h
≥ 14 years	15 mg/kg/dose q8h

- Exclusions to this dosing: Patients with renal or cardiac insufficiency, and patients receiving calcineurin inhibitors (i.e. cyclosporine, tacrolimus)
- Patients receiving ECMO: Increase empiric dosage by 5 mg/kg/dose, to be given at the indicated frequency based on age and renal function. Clinical judgment warranted.
- Vancomycin in Hemodialysis:
  - First dose: 15 mg/kg (max: 1000 mg)
  - Typical maintenance dose: 7.5-10 mg/kg (administer AFTER dialysis ends)
  - Consider increasing the dose 25% when there is more than one day between HD sessions (example: for a patient on chronic MWF HD, increase the Friday post-dialysis dose by 25% as compared to the Monday and Tuesday doses)
  - Note: HD dialyzer at SLCH is high permeability
  - Monitoring: obtain pre-dialysis random level

- Maximum: most children generally do not require >2,000 mg/dose, >3,600 mg/day or >100 mg/kg/day
- The above dosing recommendations are based on internal SLCH data and existing literature in children. See 2020 guidelines for therapeutic monitoring of vancomycin, endorsed by ASHP, IDSA, PIDS, and SIDP, for additional information.

Goal vancomycin concentrations:

VANCOMYCIN GOAL TROUGH CONCENTRATIONS	
Central Nervous System Infections	15-20 mcg/mL
All other infections	10-15 mcg/mL
VANCOMYCIN PRE-HEMODIALYSIS CONCENTRATION	
All infections	15-20 mcg/mL

Additional considerations when adjusting vancomycin dosing in response to levels:

- For troughs near the desired trough range (i.e., 8-9 mcg/mL in a patient with a goal trough of 10-15 mcg/mL), strongly consider not increasing the dose, especially in patients at risk for further accumulation of vancomycin, after clinically evaluating the patient's status, microbiology data, etc. Clinical judgment warranted.
- The goal vancomycin pharmacodynamic (PD) target of AUC/MIC 400-600 is largely derived from studies of patients with MRSA bacteremia. In children, PK/PD data show that troughs as low as 7 mcg/mL correlate with AUC/MIC ratios of 400-600.
- In children, troughs >15 mcg/mL should generally be avoided (with CNS infections being an exception). Troughs >15 mcg/mL have not shown to improve outcomes in children with MRSA infections, but it is an independent risk factor for acute kidney injury (AKI).

Aminoglycoside Pediatric Dosing:

Gentamicin Synergy Dosing for Staphylococcus or Enterococcus bacteremia/endocarditis:

1.5 mg/kg/dose IV q12h

- Dosed based on adjusted body weight for obese children and adolescents
- Only need to obtain troughs to assess safety/clearance

Conventional Dosing for the Treatment of Enterobacterales (gentamicin/tobramycin) and Pseudomonas (tobramycin):

4 mg/kg/dose IV q12h

- Dosed based on adjusted body weight for obese children and adolescents
- Check peak and trough with the 3rd dose generally, or earlier if warranted based on renal function

Extended Interval Dosing for Gentamicin (for Enterobacterales) and Tobramycin (for Pseudomonas or Enterobacterales):

SLCH Once-Daily Gentamicin/Tobramycin Dosing Guidelines

1. Exclusion criteria for once-daily dosing - use traditional dosing in these patients
   a. Altered volume of distribution: weight greater than or equal to 20% IBW, ascites, or burns over greater than or equal to 20% of body.
   b. Unstable/compromised renal function or on dialysis
   c. Endocarditis, meningitis, tularemia, or osteomyelitis
   d. Hemodynamic instability
   e. PICU/CICU patients excluded unless patient has normal renal and cardiac function
   f. NICU patients
2. Dosing for children and adults*

   1 to less than 14 years..... 7.5 mg/kg/dose IV every 24 hours
   greater than or equal to 14 to less than 18..... 6.5 mg/kg/dose IV every 24 hours
   greater than or equal to 18 ..... 5 mg/kg/dose IV every 24 hours

*Cystic fibrosis patients generally require 10-15 mg/kg/dose every 24 hours.

3. Monitoring
   a. Consider checking a baseline serum creatinine at initiation of therapy.
   b. Check a peak level 30 minutes after second dose completed. Check an additional level 6-8 hours after the peak level.
      GOAL PEAK 15 -25 mcg/mL**
      GOAL TROUGH less than 0.5 mcg/mL (Trough will be extrapolated from the 2 levels drawn)
   c. Patients on long-term therapy should have audiology examination and weekly serum creatinine along with aminoglycoside trough level every 7 - 10 days.

***Note: Goal peak reflects goal of achieving 8 - 10 times the MIC of gram - negative organisms. Certain species (e.g. Klebsiella oxytoca, Enterobacter cloacae and E. aerogenes, and Pseudomonas sp.) have the highest MICs.*

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APPENDIX 2: MODIFIED BELL'S STAGING CRITERIA FOR NEC

Review of Bell's stages	*Clinical findings*	*Radiographic findings*	*Gastrointestinal findings*
Stage I	Apnea and bradycardia, temperature instability	Normal gas pattern or mild ileus	Gastric residuals, occult blood in stool, mild abdominal distention
Stage II A	Apnea and bradycardia, temperature instability	Ileus gas pattern with one or more dilated loops and focal pneumatosis	Grossly bloody stools, prominent abdominal distention, absent bowel sounds
Stage II B	Thrombocytopenia and mild metabolic acidosis	Widespread pneumatosis, ascites, portal-venous gas	Abdominal wall edema with palpable loops and tenderness
Stage III A	Mixed acidosis, oliguria, hypotension, coagulopathy	Prominent bowel loops, worsening ascites, no free air	Worsening wall edema, erythema and induration
Stage III B	Shock, deterioration in laboratory values and vital signs	Pneumoperitoneum	Perforated bowel

APPENDIX 3: TETANUS PROPHYLAXIS IN ROUTINE WOUND MANAGEMENT

History of Adsorbed Tetanus Toxoid (Doses)	**Clean, Minor Wounds**		**All Other Wounds[a]**	
	DTaP or Tdap[b]	**TIG[c]**	**DTaP or Tdap[b]**	**TIG[c]**
Fewer than 3 or unknown	Yes	No	Yes	Yes
3 or more	No if <10 y since last tetanus-containing vaccine dose	No	No[d] if <5 y since last tetanus-containing vaccine dose	No
	Yes if ≥10 y since last tetanus-containing vaccine dose	No	Yes if ≥5 y since last tetanus-containing vaccine dose	No

a – Such as, but not limited to, wounds contaminated with dirt, feces, soil, and salvia (eg, following animal bites); puncture wounds; avulsions; and wounds resulting from missiles, crushing, burns, and frostbite.
b – DTaP is used for children younger than 7 years. Tdap is used for children 7 years and older.
c – Immune Globulin Intravenous should be used when TIG is not available
d – More frequent boosters are not needed and can accentuate adverse effects

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