INCLUSION CRITERIA

- These generally apply to children who *are previously healthy and are appropriately vaccinated* who are admitted to the general medicine floor with normal liver and kidney function
- All doses are IV unless otherwise specified
- Please continue to think about the likely pathogens based on the epidemiologic and clinical history and physical and consider alternative treatment regimens as appropriate
- Please discuss with the staffing physician, and/or the Infectious Diseases on call for recommendations in unique situations
- Antibiotic guidelines may differ in those with more severe/critical illness and in those with systemic inflammatory response syndrome
- Equivalent oral dosing for some diagnoses may be considered (e.g. bacterial pneumonia)
- Consult with clinical pharmacist for dosing recommendations and/or Lexicomp for those with underlying renal or hepatic disease

Abbreviations:

GAS	Group A streptococcus
GBS	Group B streptococcus
Hib	*H. influenzae* type b
MRSA	Methicillin-resistant *Staphylococcus aureus*

INFECTION AND/OR FEVER IN A YOUNG INFANT BORN AT >36 WEEKS GESTATION AND <2 MONTHS OF AGE[1,4] WITHOUT ASSOCIATED LOCALIZING SIGNS OF SYMPTOMS

Population	Pathogens to Target	Suggested Therapy				
		Ampicillin	**Gentamicin**	**CefTRIAXone**	**Acyclovir (if indicated)*** **	If CSF is strongly suggestive of **bacterial** meningitis, (e.g. gram stain is positive), Call Attending ± ID
Neonate (less than 1 week)	GBS, Gram negative rods (most common *E. coli)*, Listeria, enterococcus less likely	100 mg/kg/dose q8h	4 mg/kg q24h	Do not use	20 mg/kg/dose q8h	Replace gentamicin with cefTAZidime 50 mg/kg/dose q8h for suspected Gram negative meningitis
Neonate (7-28 days)	*E. coli*, GBS, Listeria	75 mg/kg/dose q6h	5 mg/kg q24h	Generally used with caution	20 mg/kg/dose q8h	Replace gentamicin with cefTAZidime 50 mg/kg/dose q8h for suspected Gram negative meningitis
1-2 months	*E. coli*, GBS, *N. meningitidis*, *S. pneumoniae*, and Hib (esp. in unimmunized) after one month, Listeria much less likely	Do not use routinely	Do not use	75 mg/kg/dose or 100 mg/kg/dose q24h if concerns for meningitis	20 mg/kg/dose q8h	Add vancomycin 15 mg/kg/dose q6h (if Gram stain is positive for a Gram positive organism or shows no organism)

***Indications: Maternal history of herpes, seizures, hypothermia, suspicious skin lesions including the scalp, CSF pleocytosis with a negative gram stain, overall ill appearance, or ALT >50

Isolated Mastitis for infants >8 days without fever: clindamycin 5 mg/kg/dose q6h. If associated with fever or other systemic symptoms, consider possible disseminated disease (including CNS disease) and use broader therapy accordingly.

Antimicrobial Stewardship Guidelines for Otherwise Healthy Children with Common Conditions

CENTRAL NERVOUS SYSTEM INFECTIONS

1. Bacterial meningitis beyond the neonatal/young infant period: **Target *S. pneumoniae, N. meningitidis, Hib* (much less likely):**
   → CefTRIAXone 100 mg/kg/dose q24h (max 4000 mg/dose) + vancomycin 15 mg/kg/dose q6h (max 1000 mg/dose)

2. Brain abscess: **Target anaerobes, *S. anginosus* group, *S. pneumoniae, S. aureus, P. aeruginosa* if chronic otitis media(OM):**
   → CefTRIAXone 100 mg/kg/dose q24h (max 4000 mg/dose) + vancomycin 15 mg/kg/dose q6h (max 1000 mg/dose) + metroNIDAZOLE 10 mg/kg /dose q6h (max 500 mg/dose)
   If concern for *P. aeruginosa* as with chronic OM, use cefTAZidime instead of cefTRIAXone: cefTAZidime 50 mg/kg/dose q8h (max 2000 mg/dose)

3. Epidural abscess/subdural empyema: **Target *S. anginosus* group, *S. pneumoniae, Haemophilus* spp., *Moraxella* spp., oral anaerobes, and sometimes staphylococci:**
   → CefTRIAXone 100 mg/kg/dose q24h (max 4000 mg/dose) + vancomycin 15 mg/kg/dose q6h (max 1000 mg/dose) + metroNIDAZOLE 10 mg/kg/dose q6h (max 500 mg/dose)
   If concern for *P. aeruginosa* as with chronic OM, use cefTAZidime instead of cefTRIAXone: cefTAZidime 50 mg/kg/dose q8h (max 2000 mg/dose)

4. HSV encephalitis[4]: Dose per ideal body weight
   → Neonate-3 months: Acyclovir 20 mg/kg/dose q8h
   → >3 months-12 years of age: Acyclovir 15 mg/kg/dose q8h
   → >12 years: Acyclovir 10 mg/kg/dose q8h (higher doses associated with nephrotoxicity)

SKIN AND SOFT TISSUE INFECTIONS[5,6,8]

1. Purulent cellulitis/abscess (if bite wound, see page 4, item number 7): **Target *S. aureus* and Group A streptococcus (GAS)**
   → Clindamycin 10 mg/kg/dose q8h (max 600 mg/dose). This can be given either PO or IV. Consider adding Gram negative coverage if suspected based on history; consult with ID re: antimicrobial agent to use. In addition, if there is a past history of a skin/soft tissue infection, check to see that the isolate was susceptible to clindamycin; if not, discuss with attending.
   Think about Gram negative rod infections if the skin infection was acquired in water (e.g. *Aeromonas spp. with fresh water, Vibrio vulnificus if salt water, and M. marinum* associated with fish tank or fish spine)

2. Cellulitis (non-purulent):
   → CeFAZolin and/or cephalexin. CeFAZolin 25 mg/kg/dose q8h (max 1000 mg/dose q8h). Cephalexin 25 mg/kg/dose q8h (max 500 mg/dose q8h)

3. Pilonidal cyst/abscess: **Target *E. coli* and anaerobes**
   → Ampicillin/sulbactam 50 mg/kg/dose q6h (max 2000 mg ampicillin/dose)

4. Peri-rectal abscess:
   → Ampicillin/sulbactam 50 mg/kg/dose q6h (max 2000 mg ampicillin/dose)

5. Acute bacterial lymphadenitis: **Target *S. aureus* and GAS for acute disease. Differential expands for chronic lymphadenitis (>7 days of symptoms)**.
   → Clindamycin 10 mg/kg/dose q8h (max 600 mg/dose)

6. Pyogenic Myositis: **Target *S. aureus* and GAS**
   → Clindamycin 13 mg/kg/dose q8h (max 900 mg/dose). **If patient has tachycardia or more severe illness, expand coverage per musculoskeletal guideline.**

SKIN AND SOFT TISSUE INFECTIONS[5,6,8], CONTINUED

7. Dental or animal/human bite associated cellulitis or abscess. **Target oral anaerobes: *Pasteurella multocida*, *Capnocytophagia*, *Eikenella corrodens*, all of which are Gram negative**
   → Ampicillin/sulbactam 50 mg/kg/dose q6h (max 2000 mg ampicillin/dose)

8. Eczema herpeticum: **Target HSV**
   → Acyclovir 10 mg/kg/dose q8h for children 3 months and older
   If appears to have bacterial superinfection with *S. aureus* or Group A streptococcus, consider adding ceFAZolin 25 mg/kg/dose q8h (max 1000 mg/dose)

9. Staphylococcal scalded skin syndrome in non-neonates:
   → Clindamycin 10 mg/kg/dose q8h (max 600 mg/dose)

SKELETAL INFECTIONS

1. Septic Arthritis and Suspected Acute Hematogenous Osteomyelitis. **For chronic osteomyelitis in an afebrile child, consider withholding antibiotics** **see muskuloskeletal guideline**

Population	Target pathogens	Suggested dose
6 months to 4 years, completely immunized	*S. aureus*, *K. Kingae*[10], Group A streptococcus (GAS) and *S. pneumoniae*	Clindamycin 13 mg/kg/dose q8h (max 900 mg/dose) + CeFAZolin 40 mg/kg/dose q8h (max 2000mg/dose)
6 months to 4 years (incompletely immunized against *H. influenzae* or *S. pneumoniae*)	*S. aureus, K.Kingae*[10], GAS, *S. pneumoniae* and Hib	Clindamycin 13 mg/kg/dose q8h (max 900 mg/dose) + CefTRIAXone 75 mg/kg/dose q24h (max 2000 mg/dose)
Over 4 years	*S. aureus* and GAS; consider gonorrhea in an adolescent and/ or with suspected sexual contact	Clindamycin 13 mg/kg/dose q8h (max 900 mg/dose) If gonorrhea is suspected, consider adding CefTRIAXone 75 mg/kg/dose q24h (max 2000 mg/dose)
Child with puncture wound through shoe	*S. aureus* and GAS; *P. aeruginosa*	Clindamycin 13 mg/kg/dose q6h (max 900 mg/dose) + Ciprofloxacin 15 mg/kg/dose q12h (max 400 mg/dose)

RESPIRATORY TRACT INFECTIONS

UPPER:

1.Pre- and post-septal (orbital) cellulitis/abscess secondary to sinusitis: **Target *S. pneumoniae*, oral anaerobes, *H. influenzae*, *Moraxella catarrhalis***
- → Ampicillin/sulbactam 50 mg/kg/dose q6h (max 2000 mg ampicillin/dose). If *S. aureus* is suspected, consider adding clindamycin.
  - a. TREAT FOR PRESUMED BRAIN ABSCESS IF CHILD HAS SEVERE HEADACHE OR OTHER NEUROLOGIC SYMPTOMS THAT SUGGEST THIS (SEE #2 UNDERCNS INFECTIONS)
  - b. For rapidly evolving orbital cellulitis or history of MRSA infection, consider adding clindamycin 13 mg/kg/dose q6h (max 900 mg/dose).
    If large subperiosteal abscess that is going to be drained (could consider adding clindamycin or vancomycin depending on clinical severity).

2.Pre-septal cellulitis with a clear nidus from the skin**: Target *S. aureus*, Group A streptococcus (GAS)**
- → If concern for abscess, clindamycin 10 mg/kg/dose q8h (max 600 mg/dose) OR
- → If more consistent with cellulitis, ceFAZolin 25 mg/kg/dose q8h (max 1000 mg/dose)

3. Facial cellulitis of odontogenic origin: **Target oral anaerobes, respiratory flora**
- → Ampicillin/sulbactam 50 mg/kg/dose q6h (max 2000 mg ampicillin/dose)

4. Acute sinusitis[9]: **Target *S. pneumoniae*, *H. influenzae*, *Moraxella catarrhalis***
- → Ampicillin/sulbactam 50 mg/kg/dose q6h (max 2000 mg ampicillin/dose)
- → If frontal sinusitis and swelling over the frontal bone, consider Pott's puffy tumor, adding *S. aureus* to the differential, consider adding clindamycin 13mg/kg/dose q8h (max 900 mg)

5. Mastoiditis: **Target *S. pneumoniae*, oral anaerobes, and GAS or *S. aureus*. Add *Pseudomonas* to differential if the child has had chronic, suppurative otitis media and/or tympanostomy tube.**
- → Ampicillin/sulbactam 50mg/kg/dose q6h (max 2000mg ampicillin/dose). If there is a history of MRSA, add clindamycin 13mg/kg/dose (max 900mg/dose).
- → If patient has chronic, suppurative OM, add *Pseudomonas* to the microbial differential diagnosis and use cefepime 50mg/kg/dose q8h (max 2000mg/dose) instead of ampicillin/sulbactam

6. Peritonsillar, parapharyngeal, retropharyngeal cellulitis/abscess RPA guideline: **Target GAS, oral anaerobes (e.g. *Fusobacterium* spp.), and *S. aureus*, *M. catarrhalis*, *H. influenzae***
- → **≤24 months OR if more severe disease** (e.g. extension to mediastinum): Clindamycin 13mg/kg/dose q8h (max 900 mg/dose) AND ampicillin/sulbactam 50 mg/kg/dose q6h (max 2000 mg ampicillin/dose)
- → For severely ill children ≤24 months, use vancomycin 15 mg/kg/dose q6h instead of clindamycin
- → **>24 months:** Ampicillin/Sulbactam 50 mg/kg/dose q6h (max 2000 mg ampicillin/dose) OR
  If there is a family or personal history of MRSA, use clindamycin alone 13 mg/kg/dose q8h (max 900 mg/dose)
  If patient has a history of MRSA that is resistant to clindamycin, consult with physician on call

7. HSV gingivostomatitis beyond young infant period :
- → Acyclovir 10 mg/kg/dose q8h. General duration of therapy (IV and/or PO) is for 7 days. Switch to oral when child is able to tolerate.

8. Acute suppurative otitis media[3]: **Target *S. pneumoniae*, *Moraxella catarrhalis*, *H. influenzae* (non-typeable)**
- →"High-dose" Amoxicillin 45 mg/kg/dose PO q12h. Consider using amoxicillin/clavulanate for children who had received amoxicillin in the last one month or have a history of resistant infection.
- → Duration of treatment: ◦ <24 months: 10 days ◦ 2-5 years: 7 days ◦ ≥6 years: 5 days
  Watchful waiting can be considered, especially for children over the age of 24 months

RESPIRATORY TRACT INFECTIONS[2], CONTINUED

LOWER:

1. Community acquired bacterial pneumonia: (see uncomplicated pneumonia and complicated pneumonia guideline) **Target *S. pneumoniae* most common; consider atypical respiratory pathogens especially in those over age 5 years**

Age	Uncomplicated (lobar)	Complicated (moderate or larger parapneumonic effusion or pneumatocoele)
2-12 months	Viral most common If needed, ampicillin 75 mg/kg/dose PO q6h x7 days	CefTRIAXone 75 mg/kg/dose q24h Consider adding clindamycin 13 mg/kg/dose q8h
12 months-5 years (*Mycoplasma pneumonia* is very unlikely in this age group)	Viral most common Ampicillin 75 mg/kg/dose PO q6h x7 days It is generally not recommended to empirically provide azithromycin; consider mycoplasma PCR if this is suspected	CefTRIAXone 75 mg/kg/dose q24h If history of MRSA, consider adding Clindamycin 13 mg/kg/dose q8h It is generally not recommended to empirically provide azithromycin; obtain mycoplasma PCR if this is suspected
>5 years of age	Ampicillin 75 mg/kg/dose PO q6h x7 days (max 2000 mg/dose) It is generally not recommended to empirically provide azithromycin; obtain mycoplasma PCR if this is suspected	CefTRIAXone 75 mg/kg/dose q24h (max 2000 mg/dose) It is generally not recommended to empirically provide azithromycin; obtain mycoplasma PCR if this is suspected

2. Community acquired *Mycoplasma pneumoniae* pneumonia (note, very unlikely in children <5 years old):
   → Azithromycin 10 mg/kg PO x1 dose day 1 (max 500 mg/dose), then 5 mg/kg/dose PO (max 250 mg/dose) q24h x 4 doses

3. Pertussis: **In general, treatment does not impact current illness when patient is in the paroxysmal phase, so it is preferable to wait for laboratory confirmation**.
   → ≤6 months: azithromycin 10 mg/kg/dose PO q24h every day for 5 days
   → >6 months of age: azithromycin 10 mg/kg/dose x1 PO (max 500 mg/dose), then 5 mg/kg/dose PO (max 250 mg/dose) q24h x 4 days

4. Aspiration pneumonia: **Target oral anaerobes**
   → Community acquired: ampicillin/sulbactam 50 mg/kg/dose q6h (max 2000 mg ampicillin/dose)

URINARY TRACT INFECTIONS[7]

1. Pyelonephritis: **Target Gram negative with most common being *E. coli*, and second/third *Klebsiella* spp**
   → CefTRIAXone 75 mg/kg/dose q24 hours (2000 mg/dose)
   If there is a complicated urinary tract or history of chronic urinary tract infection, then consider treatment to cover for *Pseudomonas* or other Gram negatives
   If prior history of UTI, check prior urine cultures for bacteria and susceptibilities and consider treatment for these pathogens

2. Cystitis (patient with no fever, systemic symptoms, flank pain, or vomiting):
   → Nitrofurantoin 1.5 mg/kg/dose q6h (max 100 mg/dose)
   If prior history of UTI, check prior urine cultures for bacteria and susceptibilities and consider treatment for these pathogens

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