

## **Empiric Antibiotics for Pediatric Infections Seen in ED**

**NOTE:** Choice of empiric antibiotic therapy must take into account local pathogen frequency and resistance patterns, individual patient characteristics, and individual potential problems with toxicity, cost, or compliance. These are guidelines only.

### **HEENT**

**Otitis media:** duration of therapy 10 days < 2yo, 7 days 2-5yo, 5-7 days 6yo+

Source: AAP Otitis Media Guidelines

Amoxicillin 80-90 mg/kg/day PO div BID (max 750 mg/dose) – 1<sup>st</sup> line

Standard dose amoxicillin 40-50 mg/kg/day may be acceptable for >2yo

Augmentin ES 90 mg/kg/day PO div BID (max 875 mg/dose)

Augmentin 1<sup>st</sup> line if Amox within last 30 days, otitis-conjunctivitis syndrome

Alternatives:

Cefdinir 14 mg/kg/day PO div BID (max 300 mg PO BID)

Cefuroxime 30 mg/kg/day PO div BID (max 250 mg PO BID)

Cefpodoxime 10 mg/kg/day PO div BID (max 200 mg PO BID)

Ceftriaxone 50 mg/kg IM or IV x 1-3 days (max 1 gm)

Clindamycin 40 mg/kg/day div PO TID (max 300 mg/dose) +/- 3<sup>rd</sup> gen cephalosporin

**Sinusitis:** duration of therapy for pediatric sinusitis generally 10-14 days

Sources: IDSA and AAP Sinusitis Guidelines

Augmentin ES 90 mg/kg/day PO div BID (max 875 mg/dose)

Alternatives: Clindamycin + 3<sup>rd</sup> generation Cephalosporin (Cefixime or Cefpodoxime)

Levofloxacin in > 17yo 500mg PO daily, consider in < 17yo 10-20 mg/kg/day

Linezolid 10 mg/kg/dose (max 600mg) q8 hours PO + 3<sup>rd</sup> generation Ceph

### **Strep pharyngitis:**

Source: IDSA Group A Streptococcal Pharyngitis Guideline

Penicillin VK 250mg PO BID for child, 500mg PO BID for adol/adult x 10 days OR

Amoxicillin 50 mg/kg/day PO div qD or BID x 10 days (max 1gm/day)

PCN allergic alternatives: Cephalexin 20 mg/kg/dose PO BID (max 500 mg/dose) x 10 days

Cefadroxil 30 mg/kg PO daily (max 1 gm) x 10 days

Clindamycin 7 mg/kg/dose PO TID (max 300 mg/dose) x 10 days

Azithromycin 12 mg/kg PO daily (max 500 mg/dose) x 5 days

Clarithromycin 7.5 mg/kg/dose PO BID (max 250 mg/dose) x 10 days

Note: previously recommended Bicillin LA 600,000 units IM for < 27kg, 1.2 million units IM for ≥ 27kg x 1, but currently nationwide severe shortage so NOT recommended

**Perichondritis:** Source: UpToDate

Ciprofloxacin 10 mg/kg/dose PO (max 500 mg/dose) BID

Inpatient: Ceftazidime 50 mg/kg/dose q8 hours IV

**Odontogenic infection:** Source: Harbor-UCLA Pediatric ID

Outpatient: Amoxicillin-clavulanate 45 mg/kg/day div BID (max 875 mg/dose) PO x 10 days

OR Clindamycin 40 mg/kg/day (max 600 mg / dose) div TID PO x 10 days

Inpatient: Ampicillin-Sulbactam 50 mg/kg (max 3 gm) IV q 6 hours OR Clindamycin 40 mg/kg/day div q 8 hours IV (max 600 mg / dose)

### **Urinary tract infection**

Sources: UpToDate, Harbor-UCLA Pediatric ID, AAP UTI Guidelines

#### **Uncomplicated cystitis and pyelonephritis outpatient**

Cephalexin 50 mg/kg/day PO div TID (max 500 mg/dose) x 10 days (5-7 days may be sufficient)

Adolescent / Adult 500mg PO BID x 3 days

Treat for 14 days for pyelonephritis (7-10 days may be sufficient) OR

Cefixime 16 mg/kg PO on first day, followed by 8 mg/kg/day (max 400 mg) OR

Cefdinir 14 mg/kg/day PO div BID (max 300 mg PO BID) OR

Ceftibuten 9 mg/kg/day PO (max 400 mg) OR

Cefpodoxime 10 mg/kg/day PO div BID (max 200 mg PO BID) OR

Cefprozil 30 mg/kg/day PO div BID (max 500 mg PO BID) OR

Ciprofloxacin in > 17 year olds 500 mg PO q 12 hours OR

Nitrofurantoin 5-7 mg/kg/day PO div q6 x 10 days (max 400 mg/day) – 1<sup>st</sup> choice for pregnant

Do not use for pyelonephritis

Trimethoprim-Sulfamethoxazole depending on local resistance patterns

TMP-SMX 40mgTMP/200mgSMX/5mL) 8-10 mg/kg/day TMP div BID (max 160mg = DS)

#### **Pyelonephritis inpatient**

Cefotaxime or Ceftriaxone 50 mg/kg/dose IV q12 hours

If suspect enterococcus, add Ampicillin 100 mg/kg/day IV div q6 hours

### **Community-acquired pneumonia**

Sources: IDSA Pediatric Community-Acquired Pneumonia Guideline & Harbor-UCLA Pediatric ID

#### **Outpatient treatment:**

< 5 years Amoxicillin 90 mg/kg/day PO div BID (max 875 mg / dose) x 10 days OR

Augmentin ES 90 mg/kg/day PO div BID (max 875 mg/dose)

≥ 5 years Azithromycin 10 mg/kg (max 500 mg) PO on day 1, then 5 mg/kg (max 250 mg) on days 2-5

Alternatives to amoxicillin if PCN-allergic: Cefpodoxime, Cefprozil, Cefuroxime

If have specific reason to suspect atypical pneumonia: Azithromycin, alternative Clarithromycin

15 mg/kg/day PO div BID or Erythromycin 40 mg/kg/day PO div QID

#### **Inpatient treatment:**

All ages Ceftriaxone or Cefotaxime 50 mg/kg/dose IV (max 1 gm) q 24 hours OR

Ampicillin 50 mg/kg (max 2gm/dose) IV q6 hours

Add Clindamycin 40 mg/kg/day div q8 hours IV (max 300 mg/dose) OR

Vancomycin 15 mg/kg/dose q8 hours IV for suspected MRSA

Add Azithromycin if suspect atypical pneumonia

### **Ventilator-associated pneumonia**

Piperacillin-tazobactam 100 mg/kg q 8 hours for (max 4.5 gm/dose, 16 gm/day) + Vancomycin

15 mg/kg/dose (max 2 gm / dose) q8 hours IV OR

Clindamycin 40 mg/kg/day div q8 hours IV AND either Ceftazidime 50 mg/kg/dose IV q8 hours

OR Cefepime 50 mg/kg/dose IV q8hours (max dose 2 gm for both)

## **Influenza**

Source: CDC

Duration of treatment 5 days. Not useful if > 48 hours of symptoms already. Given PO

### **Oseltamivir**

2 weeks to 1yo	3 mg/kg BID	available in 6mg/mL solution
>1yo and < 15kg	30 mg BID	
15-23kg	45 mg BID	
23-40kg	60 mg BID	
40kg and higher	75 mg BID	

## **Rule out sepsis / bacteremia (not meningitis)** Source: UpToDate & Harbor-UCLA Peds ID

0-28 days Ampicillin 50-100 mg/kg IV + Gentamicin 3.5 mg/kg IV OR Cefotaxime 50 mg/kg IV; Consider adding Acyclovir 20 mg/kg (max 400 mg/dose) IV q8 hours

> 28 days Ceftriaxone OR Cefotaxime 50 mg/kg IV (max 1gm)

### **Severe sepsis / Septic shock** (Source: Harbor-UCLA Pediatric ID)

Vancomycin 15 mg/kg (max 2gm) IV q8 hours AND ceftriaxone 50 mg/kg IV q24 hours OR (cefepime 50 mg/kg (max 2gm) IV q8 hours OR meropenem 20 mg/kg (max 2gm) IV q8 hours if concern for pseudomonas or healthcare associated infection)

## **Bacterial Meningitis**

Sources: IDSA Bacterial Meningitis Guidelines, Harbor-UCLA Pediatric ID

0-6 weeks Ampicillin 100 mg/kg IV q 8 hours + Cefotaxime 100 mg/kg IV q8 hours  
Consider adding Acyclovir 20 mg/kg (max 400 mg / dose) IV q8 hours

> 6 weeks Ceftriaxone 50 mg/kg IV (max 2gm) q 12 hours AND  
Vancomycin 15 mg/kg/dose q 8 hours IV

## **Fever & Neutropenia**

Sources: American Society of Clinical Oncology Guidelines and Harbor-UCLA Pediatric ID

Cefepime OR Ceftazidime 50 mg/kg (max 2gm) IV q 8 hours OR

Piperacillin-tazobactam 100 mg/kg q 6-8 hours IV (max 4.5 gm/dose, 16 gm/day)

Add Vancomycin 15 mg/kg (max 2gm) IV q8 hours if concern for line-related infection

(erythema, tenderness, unable to draw from) or severe mucositis or h/o Ara-C treatment or symptoms c/w pneumonia

### **Abdominal pain (consider typhlitis):**

Piperacillin-tazobactam 100 mg/kg q 6-8 hours IV (max 4.5 gm/dose, 16 gm/day) OR Cefepime or Ceftazidime 50 mg/kg (max 2gm) IV q 8 hours AND

Gentamicin 2.5 mg/kg/dose IV q8 hours (some institutions use extended interval dosing 4.5-7.5 mg/kg/day IV q 24 hours) AND

Metronidazole 30 mg/kg/day IV div q6-8 hours (max 1 gm/dose)

## **Appendicitis / Intraabdominal Infection** Source: UpToDate, Harbor-UCLA Pediatric ID

Non-perforated (surgical prophylaxis): Cefoxitin 40 mg/kg/dose IV q6 hours (max 1 gm/dose)

Perforated: Ceftriaxone 50 mg/kg/dose IV q 24 hours (max 1-2 gm/dose) AND

Metronidazole 15 mg/kg q8 hours IV (max 0.5-1 gm/dose)

NEC: Ampicillin 50-100 mg/kg IV + Gentamicin 3.5 mg/kg IV + Metronidazole 15 mg/kg IV

### **Bacterial infectious diarrhea**

Sources: IDSA Infectious Diarrhea Guidelines, Harbor-UCLA Pediatric ID

Not always treated with antibiotic therapy empirically, await culture results if possible (treatment may increase risks of HUS, of carrier state in Salmonella typhi, and of resistance overall)

Azithromycin 10 mg/kg (max 500 mg) on day 1, then 5 mg/kg (max 250 mg) on days 2-5 OR

Ciprofloxacin in > 17 year olds 500 mg q 12 hours x 3-5 days OR

Bactrim (TMP-SMX 40mgTMP/200mgSMX/5mL) 8-10 mg/kg/day TMP div BID (max 160mg = DS) x 3-5 days depending on local resistance patterns

### **Skin & Soft Tissue Infection**

Sources: IDSA Skin and Soft Tissue Infection Guideline, UpToDate, Harbor-UCLA Pediatric ID

#### Routine cellulitis (no abscess, non-purulent) – outpatient treatment

Cephalexin 60 mg/kg/day PO div TID (max 1 gm / dose) x 10 days OR

Dicloxacillin 50 mg/kg/day PO div q6 hours (max 500mg/dose) x 10 days AND/OR

If suspect MRSA, TMP-SMX 40mgTMP/200mgSMX/5mL) 10 mg/kg/day TMP PO div BID (max 160mg = DS) OR

Clindamycin 40 mg/kg/day PO div TID (max 600 mg/dose) depending on local resistance

#### Cellulitis – inpatient management

Cefazolin 100 mg/kg/day div q8 hours IV (max 1-2 gm/dose) OR

Oxacillin OR Nafcillin 100 mg/kg/day div q6 hours IV (max 1 gm/dose)

If suspect MRSA or purulence present: Clindamycin 40 mg/kg/day div q8 hours IV (max 300 mg/dose) depending on local resistance OR

Vancomycin 10 mg/kg/dose (max 2 gm/dose) q8 hours IV

Note: Linezolid covers MRSA and Group A Strep – consult with ID before using

#### Abscess or purulent drainage

If adequate I&D no antibiotics indicated

If surrounding cellulitis, TMP-SMX 40mgTMP/200mgSMX/5mL) 8-10 mg/kg/day TMP PO div BID (max 160mg = DS) x 10 days OR

Clindamycin 40 mg/kg/day PO div TID (max 300 mg/dose) depending on local resistance

#### Toxin-mediated disease (SSSS, toxic shock)

Vancomycin 15 mg/kg/dose q8 hours IV AND

Clindamycin 40 mg/kg/day div q8 hours IV (max 300 mg/dose)

If MRSA unlikely and patient not severely ill, may consider substituting Oxacillin OR Nafcillin 100 mg/kg/day div q6 hours IV (max 1 gm/dose) for Vancomycin above

#### Necrotizing fasciitis

Consult surgeon immediately

Piperacillin-tazobactam 100 mg/kg q 6-8 hours IV (max 4.5 gm/dose, 16 gm/day) AND

Vancomycin 15 mg/kg/dose q8 hours IV AND

Clindamycin 40 mg/kg/day div q8 hours IV (max 300 mg/dose)

## **Pelvic Inflammatory Disease**

Source: CDC 2015 STD Treatment Guidelines

### **Outpatient treatment:**

Ceftriaxone 250mg IM x 1 dose AND Doxycycline 100 mg PO BID x 14 days +/- Metronidazole 500 mg PO BID x 14 days

### **Inpatient treatment:**

Cefotetan OR Cefoxitin 2 gm IV q12 hours AND Doxycycline 100 mg PO or IV q 12 hours

Alternative Clindamycin 900 mg IV q8 hours AND Gentamicin 2 mg/kg IV loading followed by 1.5 mg/kg IV q 8 hours or 3-5 mg/kg/day

Alternative Ampicillin-Sulbactam 3 gm IV q6 hours AND Doxycycline 100 mg PO or IV q 12 hours

## **Osteomyelitis or Septic Arthritis**

Sources: UpToDate, Harbor-UCLA Pediatric ID

0-1 months Cefotaxime 50 mg/kg/dose (max 2 gm) IV q12 hours AND  
Vancomycin 15 mg/kg/dose q8 hours IV

1 mo – 48 mo Cefazolin 100 mg/kg/day div q8 IV (max 1-2 gm/dose) AND  
Vancomycin 15 mg/kg/dose q8 hours IV

> 48 months Vancomycin 15 mg/kg/dose q8 hours IV

Note: if MRSA resistance to Clindamycin is not high and patient is not severely ill, may consider substituting Clindamycin 40 mg/kg/day div q8 hours IV (max 300 mg/dose) for Vancomycin

## **Periorbital (preseptal) and orbital cellulitis** Sources: UpToDate & Harbor-UCLA Pediatric ID

Preseptal, outpatient treatment: (preseptal only, very mild and close f/u)

Skin source: Clindamycin 40 mg/kg/day PO div TID (max 300 mg/dose)

Sinus source or unclear source: Clindamycin AND

Amoxicillin-clavulanic acid 45 mg/kg/day div q12 hours PO (max 875 mg/dose) OR

Cefdinir 14 mg/kg/day PO div BID (max 300 mg/dose) OR

Cefpodoxime 10 mg/kg/day PO div BID (max 400 mg/dose)

### **Inpatient treatment preseptal cellulitis**

Ceftriaxone 50 mg/kg/dose IV q12-24 hours (max 2 gm) OR Ampicillin-Sulbactam 50 mg/kg (max 3 gm) IV q6 hours AND Vancomycin 10 mg/kg (max 2gm) IV q8 hours OR Clindamycin 13 mg/kg (max 600mg) IV q8 hours IF concerned for MRSA)

### **Orbital cellulitis (inpatient only):**

Vancomycin 15 mg/kg/dose q8 hours IV AND

Ceftriaxone 50 mg/kg/dose IV q12-24 hours (max 2 gm/dose) OR

Cefotaxime 50 mg/kg/dose IV q8 hours OR (max 2 gm/dose) OR

Ampicillin-sulbactam 300 mg/kg/day IV div q6 hours (max 3 gm/dose) OR

Piperacillin-tazobactam 100 mg/kg q 6-8 hours IV (max 4.5 gm/dose, 16 gm/day)

If suspect intracranial extension, add:

Metronidazole 30 mg/kg/day IV div q6 hours (max 1 gm/dose)