

Sinusitis, Acute Bacterial

Children's Physicians/Urgent Care

Consider acute bacterial sinusitis when a child with an acute upper respiratory infection presents with:

Persistent Illness: i.e. nasal discharge (of any quality) or cough or both lasting more than 10 days without improvement

OR

Worsening Course: i.e. worsening or new onset of nasal discharge, cough, or fever after initial improvement

OR

Severe Onset: i.e. concurrent fever (temp. $\geq 39C/102.2F$) and purulent nasal discharge for at least 3 consecutive days

- Inclusion Criteria**
- Child aged 1-18 years
- Exclusion Criteria**
- Toxic appearing
 - Children with anatomic abnormalities of the paranasal sinuses (facial dysmorphisms or trauma)
 - Immunodeficiencies
 - Immunocompromised patients
 - Cystic Fibrosis
 - Primary ciliary dyskinesia (Immotile-cilia syndrome)
 - Children with complications or suspected complications of acute bacterial sinusitis which include:
 - Preseptal orbital cellulitis or sympathetic edema
 - Subperiosteal abscess
 - Orbital abscess
 - Postseptal orbital cellulitis
 - Cavernous sinus thrombosis
 - Any neurologic changes

- Consider Viral URI**
- Provide symptom relief
 - Instruct to return if symptoms don't improve within 10 days
- Manage off Pathway**

Are signs of an acute bacterial sinusitis infection consistent with **Persistent Illness, Worsening Course, or Severe Onset?**

Persistent Illness

- For children with persistent illness, in shared decision making, providers should prescribe an antibiotic or offer observation for 3 days
- If patient does not improve clinically in observation, or if there is any clinical worsening, provider should prescribe an antibiotic

Worsening Course or Severe Onset

First Line Antibiotic Therapy

- Amoxicillin (high dose)**-90 mg/kg/day PO in two divided doses. (usual adult dose 2,000 mg/day divided BID)
 - Amoxicillin remains the antimicrobial of choice for first line treatment of acute bacterial sinusitis in situations where antimicrobial resistance is not suspected.
- Amoxicillin Clavulanate**-90 mg/kg/day PO in 2 divided doses (usual adult dose 2,000 mg/day divided BID, based on Amoxicillin component)
 - Consider for patients presenting with moderate to severe illness as well as those < 2 years, attending child care, or who have been treated with an antimicrobial in the last 30 days.
- Ceftriaxone**-50 mg/kg/dose IM (max single dose 1,000 mg)
- Children who are still significantly febrile or symptomatic at 24 hours may require additional parenteral doses before switching to oral therapy

First Line for Patients Allergic to Penicillin

- Cefdinir**-14 mg/kg/day PO in one dose (usual adult dose 600 mg/day given once daily)

Duration of antibiotic therapy may range from 10-21 days or longer. Patient should be symptom free for 7 days prior to stopping antibiotics

- Factors to consider when determining treatment:**
- Symptom severity
 - Discomfort level
 - Recent antibiotic use
 - Previous experience or outcomes with acute bacterial sinusitis
 - Cost of antibiotics
 - Ease of administration
 - Caregiver concerns about potential adverse effects of antibiotics
 - Persistence of respiratory symptoms
 - Development of complications

Clinical worsening after 72 hours of abx **OR** failure to improve after 3-5 days of antibiotics?

Complete Antibiotics

Was the patient on high dose Amoxicillin?

Amoxicillin Clavulanate (high dose) 90 mg/kg/day PO in two divided doses (usual dose 2000 mg/day divided two times a day, dosing based on Amoxicillin component)

Second Line Antibiotic Therapy in Patients with or without Penicillin Allergies:

- Cefdinir** 14 mg/kg/day PO in one dose (usual adult dose 600 mg/day given once daily) **AND Clindamycin** 30-40 mg/kg/day PO in 3 divided doses (usual adult dose 1350 mg/day divided TID)
- Cefixime** 8 mg/kg/day PO in one dose (usual adult dose 400 mg/day given once daily) **AND Clindamycin** 30-40 mg/kg/day PO in 3 divided doses (usual adult dose 1350 mg/day divided TID)
- Ceftriaxone** 50 mg/kg/dose IM (max single dose of 1000 mg) **AND Clindamycin** 30-40 mg/kg/day PO in 3 divided doses (usual adult dose 1350 mg/day divided TID)
- Doxycycline 2-4 mg/kg/day PO in one dose (usual adult dose of 2000 mg given once daily) for patients > 8 years of age

In patients who are also cephalosporin allergic and 8 years of age, call Infectious Disease

Clinical worsening after 72 hours of abx **OR** failure to improve after 3-5 days of Amoxicillin Clavulanate?

Complete Antibiotics

Complete Antibiotics

Clinical worsening after 72 hours of abx **OR** failure to improve after 3-5 days of antibiotics?

- Notes:**
- Symptoms of acute bacterial sinusitis and uncomplicated viral Upper Respiratory Infection (URI) overlap considerably, and therefore it is their persistence without improvement that suggests a diagnosis of acute sinusitis.
 - Only a minority (~6-7%) of children presenting with symptoms of URI will meet criteria for persistence.
 - Practitioners should attempt to:
 - Differentiate between sequential episodes of uncomplicated viral URI from the onset of acute bacterial sinusitis
 - Establish whether the symptoms are clearly not improving

- Imaging Notes:**
- Imaging tests are not necessary in children with uncomplicated acute bacterial sinusitis
 - CT scans of the paranasal sinuses should be reserved for patients in whom surgery is being considered as a management strategy after discussion with ENT and/or Radiology.

- Indications for Referral**
- Severe infection (high persistent fever with temperature > 39C [102F]; orbital edema, severe headache, visual disturbance, altered mental status, meningeal signs) – ED, ID, ENT
 - Recalcitrant infection with failure to respond to extended courses of antimicrobial therapy – ID or ENT
 - Immunocompromised host – ID
 - Multiple medical problems that might compromise response to treatment (e.g. Hepatic or renal impairment, hypersensitivity to antimicrobial agents, organ transplant – ID
 - Unusual or resistant pathogens – ID
 - Fungal sinusitis or granulomatous disease – ID or ENT
 - Nosocomial infection – ID
 - Anatomic defects causing obstruction requiring surgical intervention - ENT
 - Recurrent episodes of acute bacterial rhinosinusitis suggesting chronic sinusitis – ENT
 - Recurrent episodes of rhinosinusitis with concern for possible allergic component - Allergy
 - Chronic rhinosinusitis (with or without polyps or asthma) with recurrent ABRS exacerbations – ENT