

Acute Bacterial Sinusitis

1 – 18 Years of Age

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

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 (temperature $\geq 39^{\circ}\text{C}/102.2^{\circ}\text{F}$) and purulent nasal discharge for at least 3 consecutive days

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

NO

PERSISTENT ILLNESS

WORSENING COURSE OR SEVERE ONSET

Consider Viral URI:

- Provide symptom relief
- Instruct caregivers to follow-up if symptoms don't improve within 10 days of onset or worsen.

- For children with persistent illness, in shared decision making with child's caregivers, providers should either prescribe an antibiotic or offer observation for 3 days.
- If the patient does not improve clinically during observation, or if there is clinical worsening of the child's condition at any time, provider should prescribe an antibiotic.

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

Inclusion Criteria

- Children ≥ 1 -18 years of age

Exclusion Criteria

- Toxic appearing
- Children with anatomic abnormalities of the paranasal sinuses (facial dysmorphisms or trauma)
- Immunodeficiencies
- 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

Notes About Antibiotics:

- Macrolides (clarithromycin & azithromycin) are not recommended for empiric therapy due to high rates of resistance of *S. pneumoniae* (~30%)
- Trimethoprim-sulfamethoxazole (TMP/SMX) is not recommended for empiric therapy because of high rates of resistance among both *S. pneumoniae* and *Haemophilus influenzae* (~30-40%)

First Line Antibiotic Therapy

Amoxicillin (high dose) 90 mg/kg/day PO in two divided doses (usual adult dose 2000 mg/day divided two times a day)

- Amoxicillin remains the antimicrobial of choice for first-line treatment of acute bacterial sinusitis in situations where antimicrobial resistance is not suspected.

Amoxicillin Clavulanate (high dose) 90 mg/kg/day PO in two divided doses (usual adult dose 2000 mg/day divided two times a day; dosing 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 1000 milligrams)

- For children who are vomiting, unable to tolerate oral medication, or unlikely to be adherent to the initial doses of antibiotic. If clinical improvement is observed at 24 hours, an oral antibiotic can be substituted to complete the course of therapy.
- Children who are still significantly febrile or symptomatic at 24 hours may require additional parenteral doses before switching to oral therapy.

First Line Antibiotics for Patients Allergic to Penicillin

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

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

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

YES

NO

Complete antibiotics

Was the patient on
high dose Amoxicillin?

NO

YES

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

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

YES

NO

Complete antibiotics

YES

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

NO

Complete 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 > 39°C [102°F]; orbital edema, severe headache, visual disturbance, altered mental status, meningeal signs) (Emergency Department [ED], Infectious Disease [ID] or ear, nose & throat [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 (eg, 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)
- Multiple recurrent episodes of acute bacterial rhinosinusitis suggesting chronic sinusitis (ENT)
- Chronic rhinosinusitis (with or without polyps or asthma) with recurrent ABRS exacerbations (ENT)
- Evaluation of immunotherapy for allergic rhinitis (Allergy)