MedStar Family Choice

Diagnosis and Management of Acute Sinusitis in Children Aged 1 to 18 Years

Clinical Practice Guideline
MedStar Health

"These guidelines are provided to assist physicians and other clinicians in making decisions regarding the care of their patients. They are not a substitute for individual judgment brought to each clinical situation by the patient's primary care provider in collaboration with the patient. As with all clinical reference resources, they reflect the best understanding of the science of medicine at the time of publication but should be used with the clear understanding that continued research may result in new knowledge and recommendations."

MedStar Pediatrics and MedStar Family Choice accept and endorse the clinical practice guidelines set forth by the American Academy of Pediatrics published in July 2013. "Clinical Practice Guideline for the Diagnosis and Management of Acute Bacterial Sinusitis in Children Aged 1 to 18 Years" The online version of these guidelines is available at: http://pediatrics.aappublications.org/content/132/1/e262

Antibiotics should not be used for viral respiratory illnesses, including bronchitis, bronchiolitis, pharyngitis, and sinusitis.

American Academy of Pediatrics: Antibiotic Stewardship in Pediatrics

Key Points:

1. **Differentiate uncomplicated viral URI and allergic rhinitis from Acute Bacterial Sinusitis (ABS)**

   a. Uncomplicated URI usually characterized by nasal symptoms (discharge and congestion/obstruction) or cough or both.
   - Nasal discharge begins as clear and watery. Typically, the nasal discharge becomes thicker and more mucoid and may become purulent for several days. Then the situation reverses, with the purulent discharge becoming mucoid and then clear again or simply resolving. May have sensation of congestion/obstruction. Course is 5-7 days
   - Associated symptoms: Fever and other constitutional symptoms tend to occur *early* in the illness and disappear within 24 to 48 hours. Cough may be secondary to post-nasal drip, which is usually worse at night, or associated viral cough.
   - Course: Usually 5 to 7 days, peak at 3-6 days but resolving symptoms may persist for 10-14 days.

   b. Uncomplicated Allergic Rhinitis

   - Nasal discharge Clear nasal discharge, pale nasal mucosa
   - Associated symptoms: Pruritic eyes and nasal mucosa, allergic shiners, cobble stoning of the conjunctiva or pharyngeal wall
   - Course: often seasonal unless indoor allergen, clear persistent discharge during exposure to allergen. Can go on to secondary bacterial sinusitis

2. Presumptive Diagnosis of Acute Bacterial Sinusitis:
Clinicians may make a presumptive diagnosis of ABS when a child with an acute upper respiratory infection (URI) presents with the following:

Persistent illness, ie, nasal discharge (of any quality) or daytime cough or both lasting more than 10 days without improvement; OR

Worsening course ie, worsening or new onset of nasal discharge, daytime cough, or fever after initial improvement; OR

Severe onset, ie, concurrent fever (temperature ≥ 39ºC/102.2ºF) and purulent nasal discharge for at least 3 consecutive days.

3. Other Diagnostic Considerations for Acute Bacterial Sinusitis:

- *History:* Consider ABS for recurrent URIs characterized by an improvement followed by a recurrence of symptoms
- *Other signs/symptom*s: Bad breath, fatigue, headache, and decreased appetite, although common, are *non-specific* indicators of acute sinusitis and may be more common in younger children. Older children may have specific symptoms such has headache and facial pain.
- *Physical exam:* most physical findings are *non-specific* and not helpful in distinguishing ABS from uncomplicated viral URI (Erythema and swelling of the nasal turbinates, tenderness on percussion of the sinuses
- *Labs:* Nasopharyngeal cultures do *not* reliably predict the etiology of acute bacterial sinusitis
- *Imaging:* Clinicians should ***not*** obtain imaging studies (plain films, contrast-enhanced computed tomography (CT), MRI, or ultrasonography) to distinguish acute bacterial sinusitis from viral URI. Obtain a contrast-enhanced CT scan of the paranasal sinuses and/or an MRI with contrast if suspect orbital or central nervous system complications of acute bacterial sinusitis.
- Consider underlying causes such as allergic rhinitis, foreign body (unilateral symptoms), structural abnormality, dental disease.

4. Antibiotic Treatment for Acute Bacterial Sinusitis:

- Severe onset and/or worsening course -> Prescribe Empiric Antibiotic Therapy
- For children with persistent Illness (nasal discharge of any quality or cough or both for at least 10 days without evidence of improvement) that is not severe onset or worsening
  -> Prescribe Empiric Antibiotic Therapy OR
  -> Offer additional outpatient observation without antibiotics for 3 days to children based on clinical judgement

  First-Line: see below

- Common bacterial pathogens include S. pneumoniae, H. influenzae, and M. catarrhalis.

First Line

Amoxicillin: Amoxicillin remains the antimicrobial agent of choice for first-line treatment of uncomplicated acute bacterial sinusitis
If patient has received Amoxicillin in past 30 days, it is recommended to use another agent.

i. Amoxicillin *90mg/kg per day in 2 divided doses x 10-14 days. (maximum of 1 gm/dose).*

Severe infection

Amoxicillin-Clavulanate:

High Dose: Patients presenting with moderate to severe illness: *Amoxicillin Clavulanate (amoxicillin component 90 mg/kg per day) in 2 divided doses (maximum of 1 gm/dose) x 10-14 days*

<40 kg: 90 mg/kg/day of Amoxicillin PO divided q12h using the Amoxicillin-Clavulanate (Augmentin) 600mg/5ml suspension
≥40 kg: 1 g/dose of Amoxicillin PO q12h using the Augmentin 1000 mg XR tablets. (Use CAUTION if substituting for the 1000 mg tablet as other tablets may increase the dose of clavulanate.)

Alternative Agents

Cefdinir or Cefuroxime

Children allergic to amoxicillin with a non-type 1 (late or delayed, > 72 hours) hypersensitivity reaction can be safely treated with cefdinir or cefuroxime
Cefdinir 14 mg/kg per day orally divided in 1 or 2 doses (maximum 600 mg/day)
Cefuroxime 30 mg/kg/day divided in 2 doses (maximum 1000 mg/day).

Clindamycin and Cefixime

In young children (< 2 years) with a serious type I hypersensitivity to penicillin and moderate or more severe sinusitis, consider a combination Clindamycin 30 – 40 mg/kg/day every 8 hours and a third-generation cephalosporin (cefixime) to achieve the most comprehensive coverage against resistant S pneumonia and H Influenza.

Levofloxacin

Levofloxacin is recommended for children with a history of type I hypersensitivity to penicillin.
6 months to <5 years: 10mg/kg/dose PO q12h (max 500 mg/day)
≥5 years: 10 mg/kg/dose PO q24h (max 500 mg/day) 10–14 days.

Ceftriaxone

Children who are vomiting, unable to tolerate oral medication, or unlikely to be adherent to the initial doses of antibiotic
50mg/kg dose IM or IV. Max 1000mg/dose
If clinical improvement is observed in 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.

Other Recommendations:

a. Macrolides (clarithromycin and azithromycin) or Trimethoprim-sulfamethoxazole are **not recommended** for empiric therapy due to high rates of resistance among S. pneumoniae (~30%).

b. Second-and third-generation oral cephalosporins as empiric monotherapy may have increased rates of resistance of S. pneumoniae.

c. Combination therapy with a third-generation oral cephalosporin (cefixime or cefpodoxime) plus clindamycin may be used as second-line therapy for children with non–type I penicillin allergy or from geographic regions with high endemic rates of resistant S. pneumoniae.

Adjuvant/Supportive Therapy:

- Nasal saline rinses may be helpful to thin mucous and help with drainage.
- Inhaled nasal steroids may be helpful to decrease intranasal swelling.
- Oral decongestants are **NOT** recommended.

5. Follow-up

- Reassess initial management if there is either a caregiver report of worsening OR failure to improve within 72 hours of initial management
- If the diagnosis of acute bacterial sinusitis is confirmed in a child with worsening symptoms or failure to improve in 72 hours, then clinicians may change the antibiotic therapy for the child initially managed with antibiotics OR initiate antibiotic treatment of the child initially managed with observation

6. Complications:

- Orbital complications are the most common. Signs of orbital infection include eyelid swelling, proptosis, and impairment of extraocular muscle movement.
- Complications divided into those involving:
    - The orbit (optic neuritis, orbital and periorbital cellulitis, orbital and subperiosteal abscess),
    - The central nervous system (meningitis, subdural and epidural empyema, brain abscess and venous sinus thrombosis),
    - The bone (maxillary osteitis, frontal osteitis, Pott puffy tumor)

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