GOALS

• Help providers improve accuracy of diagnosis of persistent, severe, and worsening acute sinusitis in children age 1 to 18.

• Select appropriate antibiotics for patients who meet the diagnostic criteria for acute bacterial sinusitis.

• Reduce the unnecessary use of antibiotics for an unclear diagnosis of sinusitis by introducing a watchful waiting option for persistent sinusitis.

• Determine appropriate referrals to ENTs.

KEY POINTS

• Watchful waiting, based on shared decision-making with the parent, is an option for persistent sinusitis. Clinicians can offer additional observation for 3 days to children who have had nasal discharge and daytime cough for ≥ 10 days. A study of children with persistent acute bacterial sinusitis found no difference in outcomes for antibiotic versus placebo.

• Imaging is not recommended to distinguish uncomplicated acute bacterial sinusitis from a viral upper respiratory infection (URI). In the majority of studies, both bacterial infections and viral URIs of the sinuses result in similar abnormal imaging findings.

• Amoxicillin is the first-line antibiotic recommended for non-severe acute sinusitis in the Intermountain region. This recommendation conforms to AAP for treatment of non-severe acute sinusitis where resistance is low. Antimicrobial resistance is currently not suspected in the Intermountain region.

Why Focus ON ACUTE SINUSITIS?

• The 2013 AAP guidelines define a new clinical presentation of acute bacterial sinusitis, “worsening course,” that helps guide appropriate management. The guideline identifies “worsening course” as worsening or new onset of nasal discharge, daytime cough, or fever after initial improvement.

• Distinguishing between sinusitis and uncomplicated URIs can be challenging. Clinicians need to differentiate between sequential, uncomplicated viral URIs and establish whether symptoms are improving before diagnosing acute sinusitis. While a typical URI improves over the course of the illness (see Figure 1), persistent sinusitis does not.

This care process model (CPM), produced by Intermountain Healthcare’s Antibiotic Stewardship team and Primary Care Clinical Program, is based on the American Academy of Pediatrics (AAP) and the Infectious Disease Society of America Clinical Practice Guidelines; it provides best-practice recommendations for diagnosis and management of acute sinusitis, including guidance for when and which antibiotics should be used.
**DIAGNOSIS AND MANAGEMENT OF**

**Sinusitis, Acute — Pediatric**

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**ALGORITHM: DIAGNOSIS**

**Signs and Symptoms of Sinusitis in a child age 1 to 18 years (a)**

<table>
<thead>
<tr>
<th>RECOMMEND symptom relief</th>
</tr>
</thead>
<tbody>
<tr>
<td>• <strong>YES</strong>: saline rinse, analgesics (b)</td>
</tr>
<tr>
<td>• <strong>NO</strong>: decongestants, cough medications, antihistamines, mucolytics, nasal sprays (c)</td>
</tr>
</tbody>
</table>

**CHECK immunization status, and RECOMMEND immunizations if applicable (see page 4).**

**CHECK for bacterial signs and symptoms, and CLASSIFY (any 1 of the following) (d)(e)**

**SEVERE**

- Fever ≥ 39°C AND purulent nasal discharge for ≥ 3 days

**PERSISTENT**

- Nasal discharge and/or daytime cough without improvement for ≥ 10 days

**WORSENING**

- Worsening or new onset symptoms (fever, headache, cough, and/or nasal discharge) after initial improvement and following a typical upper respiratory infection (URI) of ≥ 7 days

**Bacterial signs present?**

- **NO**
- **YES**

**VIRAL URI (f)**

**BACTERIAL infection (see treatment algorithm on next page)**

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**NOTE:** Imaging (x-ray, CT) is not recommended for diagnosis of uncomplicated sinusitis. Obtain a CT scan of the paranasal only if the child presents with symptoms of orbital or intracranial complications:

- **Orbital**: swollen eye, especially if accompanied by proptosis or impaired function of the extraocular muscles
- **Intracranial**: very severe headache, photophobia, seizures, or other focal neurologic findings

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**ALGORITHM NOTES**

(a) An Adult Sinusitis CPM is also available. See below.

(b) Assessing pain in preverbal children. Indicators of pain include excessive crying, fever, or changes in the child’s sleep or behavior patterns. Relief from pain medications is brief.

(c) Nasal sprays. Limited data exist demonstrating whether or not the inflammation caused by sinusitis is responsive to steroids. **AAP**

(d) Other signs of acute sinusitis include bad breath, fatigue, headache, and decreased appetite, but these are not specific indicators of sinusitis.

(e) Rhinitis. Allergic and nonallergic rhinitis can be predisposing causes of acute bacterial sinusitis or may be mistaken for sinusitis. Review family and patient history and evaluate for other symptoms of rhinitis to rule it out. **AAP**

(f) Viral URI. Recommend symptom relief and tell the parent to follow up if symptoms don’t improve within 10 days of onset, become severe, or worsen. See support tools below.

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**Intermountain patient tools**

To order copies, go to [iprintstore.org](http://iprintstore.org).

- **Colds and Coughs in Children and Adolescents: Managing Viral Infections** supports parent education and provides them with additional instructions.

- **Viral Infection Rx** enables you to communicate the diagnosis and directions for symptom relief and follow-up with the patient. Order notepads at [iprintstore.org](http://iprintstore.org).

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**Intermountain provider tools**

Available from the Primary Care Clinical Program page on [intermountain.net](http://intermountain.net) and [intermountainphysician.org](http://intermountainphysician.org):

- **Adult Sinusitis CPM**
- **Antibiotic Best Practices** website
ACUTE BACTERIAL SINUSITIS TREATMENT

ALGORITHM NOTES

(g) 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

(h) Close observation and follow up. Continued to observe patient for 48 to 72 hours; start antibiotic therapy if the child does not improve within several days of diagnosis or if there is clinical worsening of the child’s condition at any time.

(i) Antibiotics and doses

<table>
<thead>
<tr>
<th>Low-dose antibiotics</th>
<th>Amoxicillin: 45 mg/kg/day in 2 doses (max 1 g/dose)</th>
<th>If penicillin allergic: Cefdinir: 14 mg/kg/day in 1 or 2 doses (max 600 mg/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-dose antibiotics</td>
<td>Amoxicillin-clavulanate: 80 – 90 mg/kg/day in 2 doses (max 2 g/dose)</td>
<td>If penicillin allergic: Cefdinir: 14 mg/kg/day in 1 or 2 doses</td>
</tr>
<tr>
<td></td>
<td>If penicillin allergic and severe symptoms: Clindamycin: 30 – 40 mg/kg/day in 3 doses (max 600 mg/dose) AND cefdinir</td>
<td></td>
</tr>
</tbody>
</table>

- Prescribe antibiotics for 10 – 14 days or 7 days after symptoms resolve.
- Do not prescribe azithromycin.
- A single 50 mg/kg dose of ceftriaxone, IV or IM, can be given to children who are vomiting, unable to tolerate oral medication, or unlikely to adhere to the initial doses of antibiotic.
- For children allergic to penicillin and < 2 years with severe sinusitis, consider a combination of clindamycin and cefdinir to achieve the most comprehensive coverage.
- The FDA does not recommend fluoroquinolones for treatment of sinusitis if other options are available.

(j) Patient education. Educate the parent to contact you if symptoms are worse after 3 days OR if there is no improvement in 3 – 5 days.

(k) Immunization recommendations. See page 4.
References


Vaccine recommendations (cdc.gov/vaccines/hcp/acip-recs/index.html)

- **Influenza.** Annual influenza vaccine is recommended for ALL children over 6 months of age, but it is particularly important for children and adolescents at increased risk for severe complications, including those who meet any of these criteria:
  - Are immunosuppressed or have any condition that can compromise respiratory function.
  - Receive long-term aspirin therapy (at risk for Reye’s syndrome).
  - Are morbidly obese (BMI ≥ 40).
  - Have chronic pulmonary (including asthma), cardiovascular (except hypertension), renal, hepatic, neurologic, hematologic, or metabolic disorders (including diabetes mellitus).

The influenza vaccine is also recommended for parents and caregivers of children younger than 5 years.

- **Pneumonia (pneumococcal vaccine).** The pneumococcal vaccine is recommended as follows:
  - PCV13 is recommended for children age 6 to 18 years with who have not previously received PCV13 (even if they have received PCV7 or PCV23) or who have immunocompromising conditions, functional or anatomic asplenia, cerebrospinal fluid (CSF) leaks, or cochlear implants.
  - PPSV23 is recommended for children age ≥ 2 years with increased risk for invasive pneumococcal disease.

- **Pertussis.** DTaP and Tdap vaccines are recommended as follows:
  - DTaP at 2, 4, and 6 months; at 15 to 18 months; and at 4 to 6 years.
  - Tdap for children age 10 to 12 years, and at 4 to 6 years.
  - Tdap as a single dose for adolescents age 11 to 18 years (preferred administration at 11 to 12 years).

Where to find resources (intermountainphysician.org)

**GermWatch:** Physician version is available from the home page of intermountainphysician.org. Patient/public version available from germwatch.org.

**Patient and Provider Education Materials:** Available at intermountainphysician.org/clinicalprograms (click Primary Care on the left, then Topics, then Antibiotic Best Practices).

To order copies of materials, go to iprintstore.org.

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Minor update on fluoroquinolones on 09/16.

Not intended to replace physician judgment with respect to individual variations and needs.