# Complete Summary

## GUIDELINE TITLE

Evidence-based care guideline for management of acute bacterial sinusitis in children 1 to 18 years of age.

## BIBLIOGRAPHIC SOURCE(S)

Cincinnati Children's Hospital Medical Center. Evidence-based care guideline for management of acute bacterial sinusitis in children 1-18 years of age. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2006 Jul 7. 17 p. [107 references]

## GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Cincinnati Children's Hospital Medical Center. Evidence based clinical practice guideline for children with acute bacterial sinusitis in children 1 to 18 years of age. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2001 Apr 27. 17 p.

The guideline was reviewed for currency in August 2006 using updated literature searches, and was determined to be current.

## ** REGULATORY ALERT **

## FDA WARNING/REGULATORY ALERT

**Note from the National Guideline Clearinghouse**: This guideline references a drug(s) for which important revised regulatory and/or warning information has been released.

- September 11, 2007, Rocephin (ceftriaxone sodium): Roche informed healthcare professionals about revisions made to the prescribing information for Rocephin to clarify the potential risk associated with concomitant use of Rocephin with calcium or calcium-containing solutions or products.

## COMPLETE SUMMARY CONTENT

## SCOPE

### DISEASE/CONDITION(S)

Acute bacterial sinusitis

### GUIDELINE CATEGORY

Diagnosis
Evaluation
Management
Treatment

### CLINICAL SPECIALTY

Allergy and Immunology
Emergency Medicine
Family Practice
Infectious Diseases
Ophthalmology
Otolaryngology
Pediatrics
Radiology

### INTENDED USERS

Advanced Practice Nurses
Nurses
Patients
Pharmacists
Physician Assistants
Physicians

### GUIDELINE OBJECTIVE(S)

- To improve the recognition of clinical signs and symptoms consistent with the diagnosis of acute bacterial sinusitis (ABS)
- To improve the use of appropriate radiologic studies in the diagnosis of ABS
- To improve the judicious use of antibiotics in the treatment of ABS
- To outline parameters for appropriate referral to and integration of subspecialty services

### TARGET POPULATION

Children 1 to 18 years of age with suspected acute bacterial sinusitis

These guidelines do not address all considerations needed to manage the following:

- Children under 1 year of age
- Children with chronic sinusitis
- Children with identified or suspected periorbital, orbital, or intra-cranial abscess
- Children with cystic fibrosis
- Children with underlying anatomic paranasal abnormalities
- Children with ciliary dyskinesia
- Children with immune deficiencies

## INTERVENTIONS AND PRACTICES CONSIDERED

### Assessment and Diagnosis

1. Clinical diagnosis based on assessment of signs and symptoms (Note: diagnosis based on assessment of quantity, quality, and color of nasal discharge is considered but not recommended.)
2. Radiologic studies (computed tomography [CT] and magnetic resonance imaging [MRI]) (Note: Routine radiologic studies considered but not recommended for the initial management of the patient with uncomplicated acute bacterial sinusitis)
3. Laboratory assessment (Note: routine laboratory assessments such as complete blood count and nasopharyngeal culture are considered but not recommended.)
4. Sinus aspiration and bacterial culture (Note: Not recommended for use in the initial evaluation and management of the patient with uncomplicated acute bacterial sinusitis.)

### Management

1. Antibiotic treatment
    - High-dose amoxicillin or amoxicillin-clavulanate (with high-dose amoxicillin component)
    - Cefuroxime, cefpodoxime, or cefdinir ($2^{nd}$-line treatment or for patients with non-type I allergies to penicillin)
    - Alternative agent (e.g., ceftriaxone) or combination therapy (e.g., clindamycin and cefixime)
    - Clarithromycin or azithromycin (for patients with type I allergies to penicillin)
2. Symptomatic treatment of cough or congestion (considered but not recommended)
3. Follow up within 72 hours to assess for expected clinical response
4. Referral to an otolaryngologist and/or ophthalmologist for acute bacterial sinusitis with complications
5. Parental education and expectations

## MAJOR OUTCOMES CONSIDERED

Likelihood ratios for clinical signs, symptoms and diagnostic studies

## METHODOLOGY

### METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

### DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

To select evidence for critical appraisal by the group, the Medline, EmBase, and the Cochrane databases were searched for dates of January 2000 through December 2005 to generate an unrefined, "combined evidence" database using a search strategy focused on answering clinical questions relevant to acute bacterial sinusitis (ABS) and employing a combination of Boolean searching on human-indexed thesaurus terms (Medical Subject Heading [MeSH] headings using an OVID Medline interface) and "natural language" searching on words in the title, abstract, and indexing terms. The citations were reduced by eliminating duplicates, review articles, non-English articles, and adult articles. The resulting abstracts were reviewed by a methodologist to eliminate low quality and irrelevant citations. During the course of the guideline development, additional clinical questions were generated and subjected to the search process, and some relevant review articles were identified. April 2001 was the last date for which literature was reviewed for the previous version of this guideline. The details of previous review strategies are not documented. However, all original citations were reviewed for appropriateness to this revision.

**August 2006 Review**

A search using the above criteria was conducted for dates of December 2005 through July 2006. Six relevant articles were selected as potential future citations for the guideline. However, none of these references were determined to require changes to the 2006 version of the recommendations.

### NUMBER OF SOURCE DOCUMENTS

169

### METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Not stated

### RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

### METHODS USED TO ANALYZE THE EVIDENCE

Review of Published Meta-Analyses
Systematic Review

### DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

### METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

### DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Recommendations have been formulated by a consensus process directed by best evidence, patient and family preference, and clinical expertise. During formulation of these guidelines, the committee members have remained cognizant of controversies and disagreements over the management of these patients. They have tried to resolve controversial issues where possible and, when not possible, to offer optional approaches to care in the form of information that includes best supporting evidence of efficacy for alternative choices.

### RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

### COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

### METHOD OF GUIDELINE VALIDATION

Comparison with Guidelines from Other Groups
External Peer Review

### DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

External Peer Review: The guidelines have been reviewed and approved by clinical experts not involved in the development process, and other individuals as appropriate to their intended purposes.

Recommendations of Others: Recommendations for the management of sinusitis from the American Academy of Pediatrics were discussed.

## RECOMMENDATIONS

### MAJOR RECOMMENDATIONS

Each recommendation is followed by evidence classification (A-X) identifying the type of supporting evidence. Definitions for the types of evidence are presented at the end of the "Major Recommendations" field.

**Assessment and Diagnosis**

See Table 1 of the original guideline document for clinical signs and symptoms consistent with a diagnosis of acute bacterial sinusitis (ABS).

**Clinical Assessment**

1. It is recommended that the diagnosis of ABS be made clinically in the presence of a constellation of signs and symptoms of **at least 10 days duration without improvement** (Wald et al., 1984 [B], Wald et al., 1981 [B], Aitken & Taylor, 1998 [C], Wald, Guerra, & Byers, 1991 [C]). No single symptom or sign is specific for the diagnosis of ABS. See Appendix 1 of the original guideline document for likelihood ratios for clinical signs and symptoms.
    - **Note 1**: The 10-day duration is suggested because it has been shown that, in most children with uncomplicated upper respiratory infections (URI), improvement is seen on average by 10 days (Wald et al., 1984 [B], Wald et al., 1981 [B], Wald, Guerra, & Byers, 1991 [C]).
    - **Note 2**: A less common presentation, acute severe bacterial sinusitis, represents a more toxic form of ABS in which severity of symptoms, rather than persistence of symptoms, is consistent with the diagnosis (Wald, 1994 [S], Fireman, 1992 [S]). See Table 1 of the original guideline document.
2. It is recommended that the character of the nasal discharge **not** be used to make a diagnosis or as an indication for antibiotic treatment. The quantity, quality, and color of nasal discharge are not helpful in differentiating ABS from other upper respiratory illnesses (e.g., common cold, allergic rhinitis) (Wald et al., 1981 [B], Aitken & Taylor, 1998 [C], McLean, 1970 [D], Gungor & Corey, 1997 [S], Wald 1994 [S]).
    - **Note**: Physical exam is likely to reveal purulent nasal discharge and/or posterior oropharyngeal drainage. These findings, however, are non-specific and of little diagnostic usefulness (Wald, et al., 1981 [B], McLean, 1970 [D], Williams & Simel, 1993 [S], Fireman, 1992 [S]).

**Radiologic Assessment**

3. It is recommended that radiologic studies **not** be routinely obtained in the initial management of patients with suspected uncomplicated ABS (Engels et al., 2000 [M], Schwartz, Pitkaranta, & Winther, 2001 [C], American Academy of Pediatrics [AAP] 2001 [S], McAlister et al., 2000 [E], Diament 1992 [E]). See Appendix 1 of the original guideline document for likelihood ratios for radiologic studies.
    - **Note 1**: Abnormalities of the paranasal sinuses are found frequently on conventional radiographs and computed tomography (CT) scans in children **without** clinical evidence of sinusitis (see Table 3 in the original guideline document) (Rak et al., 1991 [C], Glasier, Mallory, & Steele, 1989 [C], Diament et al., 1987 [C], Glasier, Ascher, &

Williams, 1986 [C], Odita et al., 1986 [C], Shopfner & Rossi, 1973 [C], Maresh 1940 [D]).
    - **Note 2**: The presence of a URI alone (without sinusitis) can result in mucosal thickening and abnormal findings in the paranasal sinuses on plain radiographs and CT scans (Glasier, Mallory, & Steele, 1989 [C], Glasier, Ascher, & Williams, 1986 [C], Shopfner & Rossi, 1973 [C], Gwaltney et al., 1994 [D]).
    - **Note 3**: Imaging findings may persist well after symptoms improve. CT abnormalities with the common cold may last up to two weeks after symptomatic improvement (Gwaltney et al., 1994 [D]). Magnetic resonance imaging (MRI) changes in patients with symptoms of ABS may last more than eight weeks (Leopold, 1994 [C]).
    - **Note 4**: "Limited" sinus CT lacks sensitivity in identifying air-fluid levels (Gross, 1991 [C]), suboptimally visualizes the osteomeatal complex 30% of the time, and misses 20 to 30% of the findings found on full CT (Wippold et al., 1995 [C]).
4. It is recommended, for older children with persistent clinical findings after unsuccessful therapy, or for children with clinical evidence of orbital or intracranial complications of ABS, that the decision to perform radiologic studies be made in collaboration with the consulting ophthalmologist or otolaryngologist (Oxford & McClay, 2005 [D], Vazquez et al., 2004 [D], AAP, 2001 [S], Local Expert Consensus [E]). See tables below titled "Radiologic Modalities for Suspected Complications of Acute Bacterial Sinusitis" for radiologic modalities and "Complications of Pediatric Acute Bacterial Sinusitis" for description of complications.
    - **Note 1**: An otolaryngology or ophthalmology consultation prior to obtaining radiologic studies in this patient population may reduce the need for an early study and limit repeat radiation exposure *(Local Expert Consensus [E])*.
    - **Note 2**: A clear or normal Water's view (occipitomental) may be helpful in ruling out significant maxillary sinus disease (Ros, Herman & Azar-Kia, 1995 [D], Lau et al., 1999 [S], Wald, 1988 [E]).

**Table: Radiologic Modalities for Suspected Complications of Acute Bacterial Sinusitis**

| Indication | Modality |
|---|---|
| Suspected subperiosteal or orbital abscess | Contrast enhanced CT scan of orbits (thin section) |
| Suspected intracranial complications | Contrast enhanced CT or MRI of brain |

(Vazquez et al., 2004 [D], AAP 2001 [S], McAlister et al., 2000 [E], Local Expert Consensus [E])

**Laboratory Assessment**

5. It is recommended that routine laboratory testing such as a complete blood count (CBC) or nasopharyngeal culture **not** be obtained in the initial evaluation in children with uncomplicated ABS (Clement et al., 1998 [E]). See Appendix 1 in the original guideline document for likelihood ratios for laboratory studies

- **Note**: Organisms recovered from nasopharyngeal washings and throat culture do not reflect the organisms found in sinus aspirate (Wald et al., 1981 [B]).

6. It is recommended that sinus aspiration and bacterial culture **not** be obtained for use in the initial evaluation and management of the child with uncomplicated ABS. They are recognized as the "gold standard" for definitive diagnosis of bacterial sinusitis and may need to be considered under the following situations (Wald et al., 1981 [B]):
    - Severe illness or toxic-looking child
    - Immunocompromised child
    - Presence of suppurative or intracranial complications

**Management**

**General**

The treatment of pediatric ABS is best considered in light of the duration and severity of symptoms and the increasing prevalence of resistant strains of a common sinus pathogen, *Streptococcus pneumoniae*. The treatment recommendations for this guideline were developed with a focus on antimicrobial activity against *S. pneumoniae* in an era of increasing penicillin resistance. It is prudent for clinicians to consider use of the most narrow-spectrum agent that is active against the likely pathogens for the initial antimicrobial treatment of ABS in children (Dowell, Schwartz, & Phillips, 1998 [E]).

See Appendix 2 in the original guideline document for antibiotic dosages.

**Antibiotic Treatment**

7. It is recommended that high-dose amoxicillin (80 to 90 mg/kg/day) or amoxicillin-clavulanate (with high-dose amoxicillin component) be first-line therapy for most patients with pediatric ABS (Wald, Chiponis & Ledesma-Medina, 1986 [B], AAP 2001 [S], Nash & Wald, 2001 [S], Dowell et al, 1999 [E], Friedland & McCracken, 1994 [E], Local Expert Consensus [E]). Treatment duration is 10 to 14 days to minimize the development of bacterial resistance (Morris & Leach, 2002 [M], Local Expert Consensus [E]). See Appendix 2 in the original guideline document.
    - **Note 1**: Approximately 65% of the *S. pneumoniae* isolated from non-sterile sites of children in Cincinnati in outpatient settings are resistant to penicillin (Cincinnati Children's Hospital Medical Center, 2005 [O]).
    - **Note 2**: It is recognized that the rates of *S. pneumoniae* resistance to penicillin are increasing nationally and locally (Butler et al., 1996 [C], Breiman et al., 1994 [C]) and failure with amoxicillin is likely to be due to resistant *S. pneumoniae*, *Haemophilus influenzae*, or *Moraxella catarrhalis* (Whitney et al., 2000 [D]). Resistance of *S. pneumoniae* to penicillin (including amoxicillin) is mediated through alterations in the penicillin-binding proteins. Using high doses of amoxicillin saturates the penicillin-binding proteins, and is therefore considered a reasonable antibiotic option (Schrag et al., 2001 [A], Dagan et al., 2001 [C], Dowell et al., 1999 [E]). The clavulanic acid component of amoxicillin-clavulanate is active against resistant *H. influenzae* and *M.*

*catarrhalis* (beta-lactamase enzyme) (Dagan et al., 2000 [A], Wald, Chiponis, & Ledesma-Medina, 1986 [B]).

- **Note 3**: Toxic-appearing children who demonstrate poor tolerance of oral intake may require initial parenteral therapy either as an outpatient or a short inpatient stay. Reassessment after initial stabilization may avoid unnecessary imaging and referral early in the course of therapy (Local Expert Consensus [E]).

8. It is recommended that cefuroxime, cefpodoxime, and cefdinir be second-line therapy for pediatric ABS (Pichichero et al., 1997 [C], Felmingham et al., 2005 [D], Jacobs et al., 2003 [D], Jacobs et al., 1999 [D], Anon et al., 2004 [S,E], Dowell et al., 1999 [E]). Treatment duration is 10 to 14 days to minimize the development of bacterial resistance (Morris & Leach, 2002 [M], Local Expert Consensus [E]). See Appendix 2 of the original guideline document.
9. It is recommended, if clinical failure with a second-line agent occurs, that alternative agents or combination therapy be considered:
    - Intramuscular (IM) ceftriaxone (5 days)
    - Combination therapy with adequate gram-positive and -negative coverage, such as clindamycin plus cefixime

    (Anon et al., 2004 [S,E], AAP 2001 [S], Local Expert Consensus [E]). See Appendix 2 of the original guideline document.

10. It is recommended, in the penicillin-allergic patient, that the following be used:
    - Non-type I[1]: cefdinir, cefuroxime, or cefpodoxime
    - Type I[2]: clarithromycin or azithromycin

    (AAP 2001 [S], Local Expert Consensus [E]). See Appendix 2 in the original guideline document.

    - **Note**: Macrolides, azalides, and sulfa containing agents are not considered standard therapeutic agents due to either a lack of efficacy data, increasingly resistant *S. pneumoniae*, or both (Dagan et al., 2000 [A], Nelson, Mason & Kaplan, 1994 [C], Wu et al., 2004 [D], Gay et al., 2000 [D], AAP 2001 [S]).

[1] Non-type I penicillin allergy: more common; characterized by symptoms such as maculopapular, polymorphous rash, arthralgia, or emesis.

[2] Type I penicillin allergy: IgE-mediated; rare; anaphylactic reactions result in urticaria, pruritis, laryngeal edema, bronchospasm, cardiovascular collapse, and, potentially, death.

**Symptomatic Treatment**

11. It is recommended that common agents for symptomatic treatment of cough or congestion (i.e., reduction in frequency or severity), **not** be used in the routine management of patients with ABS (Schroeder & Fahey, 2004 [M], Bernard et al., 1999 [B], Davies et al.,1999 [B], Chang et al., 1998 [B], McCormick et al., 1996 [B], Taylor et al.,1993 [B], Gadomski & Horton, 1992 [O], Local Expert Consensus [E]).

- **Note 1**: Studies measuring a decrease in frequency, severity, and time to resolution of cough or congestion in children with symptoms from URI found no significant difference between any of the therapeutic interventions and placebo. The therapies evaluated were antitussives, mucolytics, inhaled steroids, inhaled and oral beta$_2$-agonists, antihistamines/decongestants (brompheniramine, phenylephrine, phenylpropanolamine, dextromethorphan/guaifenesin, oxymetolazine or "afrin"), and morphine derivatives (codeine) (Schroeder& Fahey, 2004 [M], Paul et al., 2004 [A], Bernard et al., 1999 [B], Davies et al., 1999 [B], Chang et al., 1998 [B], McCormick et al., 1996 [B], Taylor et al., 1993 [B], Gadomski& Horton, 1992 [O]).
- **Note 2**: One previously common ingredient (phenylpropanolamine) of symptomatic treatment preparations has been associated with stroke, and most antihistamines, decongestants, and antitussives have not been Food and Drug Administration (FDA) approved in children (Kernan et al., 2000 [D], AAP 1997 [S,E]).
- **Note 3**: Although hypertonic and normal saline and balanced physiological saline nasal washes are commonly used in postoperative patients and in children with chronic sinusitis (Shoseyov et al., 1998 [B], Pigret & Janowski, 1996 [B], Nuutinen et al., 1986 [C]) there is no evidence for their effectiveness in pediatric ABS.

**Follow Up**

12. It is recommended that follow-up assessment for expected clinical response occur by 72 hours of antimicrobial therapy. A lack of expected clinical improvement may indicate that a change of antibiotic is necessary (Wald, Chiponis, & Ledesma-Medina, 1986 [B], Dowell et al., 1999 [E], Local Expert Consensus [E]).

**Consults and Referrals**

Although children with the complications discussed below (see Table below titled "Complications of Pediatric Acute Bacterial Sinusitis") are listed as exclusions to this guideline, recommendations are included here to assist the practitioner in decisions regarding consultation to specialists for these key complications.

13. It is recommended that an otolaryngology and/or ophthalmology consultation be sought when signs of impending suppurative complications of ABS are present (AAP, 2001 [S], Local Expert Consensus [E]). Such complications are rare but very serious and often result from orbital or intracranial spread of infection (Oxford & McClay, 2005 [D], Rosenfeld & Rowlay, 1994 [D]).
    - **Note 1**: Preseptal cellulitis, involving only tissue anterior to the orbital septum, manifests as lid edema/erythema, conjunctivitis, and fever. It may be treated with oral antibiotics and close follow up except where toxicity or specific symptoms preclude adequate antimicrobial effectiveness by mouth (AAP, 2001 [S]).
    - **Note 2**: Consultation prior to imaging limits repeat radiation exposure (Local Expert Consensus [E]).
14. It is recommended that otolaryngology consultation be considered in cases of a moderately to severely ill child with suspected acute frontal or sphenoid

sinusitis because of the potential for intracranial spread. Infection arising in either site will generally occur in a relatively older age group (>6 years), and based on the developmental anatomy of these sinuses, the clinical presentation is likely to be more severe (Oxford & McClay, 2005 [D], Herrmann & Forsen, 2004 [D], Wolf, Anderhuber, & Kuhn, 1993 [F]).

- **Note 1**: Acute frontal sinusitis manifests as an intense frontal headache with tenderness over the sinus itself. Spread of infection anteriorly produces periosteal edema and osteomyelitis and may manifest as doughiness of the forehead skin, known as Pott's puffy tumor. Spread of infection to the cranial vault results in meningitis or intracranial abscess (Oxford & McClay, 2005 [D]).
- **Note 2**: Acute isolated sphenoid sinusitis is rare, with an estimated incidence of <1% of all sinusitis cases (Hnatuk, Macdonald, & Papsin, 1994 [S], Fearon, Edmonds, & Bird, 1979 [S], Wyllie, Kern, & Djalilian, 1973 [S]). Acute sphenoid sinusitis represents an elusive diagnosis (Myer et al., 1982 [S], Sellars, Goldberg, & Seid, 1975 [S], Postma, Chole, & Nemzek, 1995 [E]), as signs and symptoms are more variable and non-specific than those of frontal sinus disease. Nasal symptoms may be absent. Headache is severe, deep-seated and worse at night, with the pain radiating to any craniofacial region (Myer et al., 1982 [S], Sellars, Goldberg, & Seid, 1975 [S]). Suppurative complications may involve any of the vital juxtaposing structures, including the cavernous sinus, intracranial cavity, orbit, pituitary gland, or abducens nerve.

**Table: Complications of Pediatric Acute Bacterial Sinusitis**

| Complication | Signs and Symptoms | Intervention |
|---|---|---|
| Orbital cellulitis | Fever, lid edema/erythema, conjunctivitis, chemosis, altered acuity, proptosis, ophthalmoplegia, pain with eye movement, tenderness to palpation | Intravenous (IV) antibiotics<br><br>Consult:<br>• Otolaryngology and/or ophthalmology<br><br>Imaging:<br>• Decision to image made in collaboration with consulting specialist |
| Subperiosteal abscess | Above, with proptosis and ophthalmoplegia prominent features; +/- globe displacement laterally or superiorly | |
| Orbital abscess | Same as for orbital cellulitis, with proptosis and chemosis prominent features; severe impairment of vision | |
| Cavernous sinus thrombosis<br><br>and/or<br><br>Intracranial infection | Spiking fevers, cranial neuropathy, mental status changes | In addition to above:<br><br>Consult:<br>• Neurosurgery<br>• Infectious diseases |

(Oxford & McClay, 2005 [D], Vazquez 2004 [D], AAP, 2001 [S])

**Parental Expectations and Education**

15. It is recommended that, for a child with ABS, physicians explore parental expectations concerning the office visit, parental knowledge regarding respiratory infections, and preventive behavior (Mangione-Smith et al., 1999 [C], Barden et al., 1998 [C], Macfarlane et al., 1997 [C], Varonen & Sainio, 2004 [O], Local Expert Consensus [E]). Topics for discussion may include:
    - The natural history of URIs/ABS (Roberts et al.,1983 [A], Hamm, Hicks, & Bemben 1996 [C])
    - Diagnostic uncertainty (Varonen & Sainio, 2004 [O])
    - Viral and bacterial sources of ABS
    - Role of antibiotics (Hamm, Hicks, & Bemben, 1996 [C])
        - Appropriate use of antibiotics (Mangione-Smith et al., 1999 [C], Barden et al., 1998 [C], Macfarlane et al., 1997 [C])
        - Persistent or severe infections (Garbutt et al., 2001 [B], Wald, Chiponis, & Ledesma-Medina, 1986 [B])
    - Bacterial resistance (Trepka et al., 2001 [C])
    - Lack of proven efficacy for over-the-counter medications for symptom relief (Schroeder & Fahey, 2004 [M])
        - Managing cough symptoms
    - Observation for complications of ABS
    - Prevention of URIs may decrease risk of ABS
        - Handwashing (Morton & Schultz, 2004 [A], Roberts et al., 2000 [A])
        - Annual influenza vaccination (Loughlin et al., 2003 [D]).

**Definitions**:

**Evidence Grading Scale**

M: Meta-analysis or systematic review
A: Randomized controlled trial: large sample
B: Randomized controlled trial: small sample
C: Prospective trial or large case series
D: Retrospective analysis
O: Other evidence
S: Review article
E: Expert opinion or consensus
F: Basic laboratory research
L: Legal requirement
Q: Decision analysis
X: No evidence

## CLINICAL ALGORITHM(S)

An algorithm for the treatment of acute bacterial sinusitis is provided in the original guideline document.

## EVIDENCE SUPPORTING THE RECOMMENDATIONS

## REFERENCES SUPPORTING THE RECOMMENDATIONS

References open in a new window

### TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of evidence is identified and graded for each recommendation (see "Major Recommendations").

#### Evidence Grading Scale

M: Meta-analysis
A: Randomized controlled trial: large sample
B: Randomized controlled trial: small sample
C: Prospective trial or large case series
D: Retrospective analysis
O: Other evidence
S: Review article
E: Expert opinion or consensus
F: Basic laboratory research
L: Legal requirement
Q: Decision analysis
X: No evidence

## BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

### POTENTIAL BENEFITS

- Appropriate diagnosis and treatment of acute sinusitis in children
- Appropriate use of radiology studies prevents unnecessary exposure to radiation
- Appropriate use of antibiotics may help prevent development of bacterial resistance

### POTENTIAL HARMS

Not stated

## QUALIFYING STATEMENTS

### QUALIFYING STATEMENTS

- These recommendations result from review of literature and practices current at the time of their formulations. This guideline does not preclude using care modalities proven efficacious in studies published subsequent to the current revision of this document. The guideline document is not intended to impose standards of care preventing selective variances from the recommendations to meet the specific and unique requirements of individual patients. Adherence to this guideline is voluntary. The physician in light of the individual circumstances presented by the patient must make the ultimate judgment regarding the priority of any specific procedure.

- The amount or depth of quality evidence for diagnosis and treatment of pediatric acute bacterial sinusitis (ABS) is limited compared to the frequency of its occurrence. As the causative organisms in pediatric ABS and otitis media are identical, where evidence was minimal or non-existent, literature from pediatric otitis media studies was extrapolated for use in treatment recommendations. In the absence of quality evidence, expert local consensus was used.

## IMPLEMENTATION OF THE GUIDELINE

### DESCRIPTION OF IMPLEMENTATION STRATEGY

Appropriate companion documents have been developed to assist in the effective dissemination and implementation of the guideline. Experience with implementation of the original publication of this guideline has provided learnings which have been incorporated into this revision. The outcome measures monitored as of the revision publication date are:

- Percent of guideline-eligible patients seen in the Emergency Department who are prescribed antibiotics who have had symptoms $\geq$10 days duration or who are severely ill
- Percent of guideline-eligible patients seen in the Emergency Department and with symptoms $\geq$10 days duration who are prescribed either high-dose amoxicillin or high-dose amoxicillin-clavulanate

### IMPLEMENTATION TOOLS

Clinical Algorithm
Quick Reference Guides/Physician Guides

For information about availability, see the "Availability of Companion Documents" and "Patient Resources" fields below.

## INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

### IOM CARE NEED

Getting Better

### IOM DOMAIN

Effectiveness
Patient-centeredness

## IDENTIFYING INFORMATION AND AVAILABILITY

### BIBLIOGRAPHIC SOURCE(S)

Cincinnati Children's Hospital Medical Center. Evidence-based care guideline for management of acute bacterial sinusitis in children 1-18 years of age. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2006 Jul 7. 17 p. [107 references]

## ADAPTATION

Not applicable: The guideline was not adapted from another source.

## DATE RELEASED

2001 (revised 2006 Jul 7; reviewed 2006 Aug)

## GUIDELINE DEVELOPER(S)

Cincinnati Children's Hospital Medical Center - Hospital/Medical Center

## SOURCE(S) OF FUNDING

Cincinnati Children's Hospital Medical Center

## GUIDELINE COMMITTEE

Acute Bacterial Sinusitis Team 2005-2006

## COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

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All Team Members and Clinical Effectiveness support staff listed above have signed a conflict of interest declaration.

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## FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

The guideline was developed without external funding. All Team Members and Clinical Effectiveness support staff listed have declared whether they have any conflict of interest and none were identified.

## GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Cincinnati Children's Hospital Medical Center. Evidence based clinical practice guideline for children with acute bacterial sinusitis in children 1 to 18 years of age. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2001 Apr 27. 17 p.

The guideline was reviewed for currency in August 2006 using updated literature searches, and was determined to be current.

## GUIDELINE AVAILABILITY

Electronic copies: Available from the Cincinnati Children's Hospital Medical Center Web site.

For information regarding the full-text guideline, print copies, or evidence-based practice support services contact the Children's Hospital Medical Center Health Policy and Clinical Effectiveness Department at HPCEInfo@chmcc.org.

## AVAILABILITY OF COMPANION DOCUMENTS

The following are available:

- Acute bacterial sinusitis (ABS). Guideline highlights. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2006 Jul. 1 p. Electronic copies: Available in Portable Document Format (PDF) from the Cincinnati Children's Hospital Medical Center Web site.
- Acute bacterial sinusitis (ABS) Table for antibiotic therapy. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2006 Jul. 1 p. Electronic copies: Available in Portable Document Format (PDF) from the Cincinnati Children's Hospital Medical Center Web site.
- Acute bacterial sinusitis (ABS) Treatment Algorithm. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2006 Jul. 1 p. Electronic copies: Available in Portable Document Format (PDF) from the Cincinnati Children's Hospital Medical Center Web site.

## PATIENT RESOURCES

None available

## NGC STATUS

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