Complete Summary

GUIDELINE TITLE

Diagnosis and treatment of respiratory illness in children and adults.

BIBLIOGRAPHIC SOURCE(S)

Institute for Clinical Systems Improvement (ICSI). Diagnosis and treatment of respiratory illness in children and adults. Bloomington (MN): Institute for Clinical Systems Improvement (ICSI); 2008 Jan. 71 p. [175 references]

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Diagnosis and treatment of respiratory illness in children and adults. Bloomington (MN): Institute for Clinical Systems Improvement (ICSI); 2007 Jan. 71 p.

** REGULATORY ALERT **

FDA WARNING/REGULATORY ALERT

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

- July 08, 2008, Fluoroquinolones (ciprofloxacin, norfloxacin, ofloxacin, levofloxacin, moxifloxacin, gemifloxacin): A BOXED WARNING and Medication Guide are to be added to the prescribing information to strengthen existing warnings about the increased risk of developing tendinitis and tendon rupture in patients taking fluoroquinolones for systemic use.
- 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)

Respiratory illnesses:

- Viral upper respiratory infection
- Acute pharyngitis
- Rhinitis (allergic and nonallergic)
- Acute sinusitis

GUIDELINE CATEGORY

Diagnosis
Evaluation
Management
Treatment

CLINICAL SPECIALTY

Allergy and Immunology
Family Practice
Internal Medicine
Otolaryngology
Pediatrics

INTENDED USERS

Advanced Practice Nurses
Allied Health Personnel
Health Care Providers
Health Plans
Hospitals
Managed Care Organizations
Nurses
Physician Assistants
Physicians
Respiratory Care Practitioners

GUIDELINE OBJECTIVE(S)

- To increase the appropriateness of patient visits for viral upper respiratory infection, increase patient/caregiver knowledge of effective home treatment

of cold symptoms, and eliminate the inappropriate use of antibiotics in patients presenting with cold symptoms
- To reduce excessive antibiotic treatment through decreased empiric treatment of patients with pharyngitis
- To increase the use of recommended first-line medications for patients with pharyngitis
- To increase patient/caregiver knowledge about pharyngitis and pharyngitis care
- To increase the use of prophylactic medications for patients with seasonal allergic rhinitis
- To decrease the use of injectable corticosteroid therapy for patients with allergic rhinitis
- To increase the use of first-line antibiotics when indicated for patients diagnosed with sinusitis

TARGET POPULATION

Infants greater than three months, children, adolescents, and adults with respiratory illness who are in general good health

INTERVENTIONS AND PRACTICES CONSIDERED

Viral Upper Respiratory Infection

Diagnosis

1. Physical examination including assessment of symptoms of viral upper respiratory infection, considering the age of the patient.
2. Evaluation by a provider for symptoms of a serious illness and complicating factors.

Treatment/Management

1. Patient, parent, and caregiver education including the importance of hand washing, prevention of transmission in infants and toddlers, comfort measures, frequency, symptoms and natural course of viral upper respiratory infection in adults and children
2. Over-the-counter medication:

   For children:

   - Acetaminophen
   - Cold and cough medications (very sparingly)

   For adults:

   - Analgesics
   - Nasal sprays
   - Decongestants
   - Zinc

Note: The use of echinacea and high doses of vitamin C was considered but not recommended

3. Comfort measures including adequate humidity, extra fluids, nutritious diet, hard candy or throat lozenge, saline nose drops/sprays, gargling salt water, rest.
4. Callback instructions

Pharyngitis

Diagnosis/Evaluation

1. Assessment of symptoms
2. History and physical examination
3. Rapid strep test and strep culture

Management/Treatment

1. Penicillin
2. Cephalosporins, erythromycin, and clindamycin for patients allergic to penicillin

   Note: Sulfonamides and tetracyclines were considered but not recommended.

3. Patient education regarding home remedies for sore throats (e.g., acetaminophen or ibuprofen, salt water gargle, throat lozenges, hard candies, cool beverages or warm liquids) and callback instructions

Rhinitis

Diagnosis/Evaluation

1. Assessment of symptoms
2. History including history of present illness, past medical history, family history, and social and environmental history
3. Physical examination including nose, eyes, ears, lungs, and skin
4. Differentiating between allergic and nonallergic etiology: skin tests and radioallergosorbent tests and nasal smear for eosinophils

Management/Treatment

1. Treatment of allergic rhinitis:
    - Symptomatic treatment including reducing mite exposure, removing pets from the house, reducing indoor humidity to reduce mold growth, remaining indoors when pollen counts are high
    - Medication therapy
        - Intranasal corticosteroids
        - Antihistamines
        - Decongestants
        - Cromolyn
        - Anticholinergics

        - Ophthalmic medications
        - Immunotherapy
    - Referral to a specialty provider

2. Treatment of nonallergic rhinitis:
    - Azelastine HCl, intranasal corticosteroids, oral decongestants, oral antihistamines, Breathe Right® nasal strips, topical antihistamines
    - Conservative treatment (e.g., increase water intake, decrease caffeine and alcohol intake, nasal saline irrigation)
    - Referral to a specialist

Sinusitis

Diagnosis/Evaluation

1. Assessment of symptoms and complicating factors
2. History and physical examination
    - **Note**: Transillumination, plain sinus x-rays and other imaging, and maxillary antrum aspiration for culture were considered but not recommended.

Management/Treatment

1. Home self-care in selected patients such as adequate hydration, steamy shower or increased humidity in the home, warm facial packs, analgesics, saline irrigation, rest, avoiding cigarette smoke and extremely cool or dry air
2. Decongestants (topical or oral)
3. Nasal steroid spray in selected cases
4. Antibiotics such as amoxicillin or trimethoprim-sulfamethoxazole (first-line antibiotics)
5. Second-line antibiotics (refer to the original guideline document for the FDA-approved second-line antibiotics)
    - **Note**: Antihistamines were considered but not recommended

MAJOR OUTCOMES CONSIDERED

- Rate of inappropriate antibiotic usage in patients presenting with cold symptoms?
- Cost of care
- Specificity, sensitivity, and predictive value of diagnostic tests
- Effectiveness of treatment in reducing symptoms
- Adverse effects of medications

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

A literature search of clinical trials, meta-analysis, and systematic reviews is performed.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Classes of Research Reports:

A. Primary Reports of New Data Collection:

Class A:

- Randomized, controlled trial

Class B:

- Cohort study

Class C:

- Non-randomized trial with concurrent or historical controls
- Case-control study
- Study of sensitivity and specificity of a diagnostic test
- Population-based descriptive study

Class D:

- Cross-sectional study
- Case series
- Case report

B. Reports that Synthesize or Reflect upon Collections of Primary Reports

Class M:

- Meta-analysis
- Systemic review
- Decision analysis
- Cost-effectiveness analysis

Class R:

- Consensus statement
- Consensus report
- Narrative review

Class X

- Medical opinion

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

New Guideline Development Process

A new guideline, order set, and protocol is developed by a 6- to 12-member work group that includes physicians, nurses, pharmacists, other healthcare professionals relevant to the topic, along with an Institute for Clinical Systems Improvement (ICSI) staff facilitator. Ordinarily, one of the physicians will be the leader. Most work group members are recruited from ICSI member organizations, but if there is expertise not represented by ICSI members, 1 or 2 members may be recruited from medical groups or hospitals outside of ICSI.

The work group will meet for seven to eight three-hour meetings to develop the guideline. A literature search and review is performed and the work group members, under the coordination of the ICSI staff facilitator, develop the algorithm and write the annotations and footnotes and literature citations.

Once the final draft copy of the guideline is developed, the guideline goes to the ICSI members for critical review.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

The guideline developers reviewed published cost analyses.

METHOD OF GUIDELINE VALIDATION

Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Critical Review Process

Every newly developed guideline or a guideline with significant change is sent to Institute for Clinical Systems Improvement (ICSI) members for Critical Review. The purpose of critical review is to provide an opportunity for the clinicians in the member groups to review the science behind the recommendations and focus on the content of the guideline. Critical review also provides an opportunity for clinicians in each group to come to consensus on feedback they wish to give the work group and to consider changes necessary across systems in their organization to implement the guideline.

All member organizations are expected to respond to critical review guidelines. Critical review of guidelines is a criterion for continued membership within the ICSI.

After the critical review period, the guideline work group reconvenes to review the comments and make changes, as appropriate. The work group prepares a written response to all comments.

Approval

Each guideline, order set, and protocol is approved by the appropriate steering committee. There is one steering committee each for Respiratory, Cardiovascular, OB/GYN, and Preventive Services. The Committee for Evidence-based Practice approves guidelines, order sets, and protocols not associated with a particular category. The steering committees review and approve each guideline based on the following:

- Member comments have been addressed reasonably.
- There is consensus among all ICSI member organizations on the content of the document.
- Within the knowledge of the reviewer, the scientific recommendations within the document are current.
- Either a critical review has been carried out, or to the extent of the knowledge of the reviewer, the changes proposed are sufficiently familiar and sufficiently agreed upon by the users that a new round of critical review is not needed.

Once the guideline, order set, or protocol has been approved, it is posted on the ICSI Web site and released to members for use. Guidelines, order sets, and protocols are reviewed regularly and revised, if warranted.

Revision Process of Existing Guidelines

ICSI scientific documents are revised every 12 to 36 months as indicated by changes in clinical practice and literature. Every 6 months, ICSI checks with the

work group to determine if there have been changes in the literature significant enough to cause the document to be revised earlier than scheduled.

Prior to the work group convening to revise the document, ICSI members are asked to review the document and submit comments. During revision, a literature search of clinical trials, meta-analysis, and systematic reviews is performed and reviewed by the work group. The work group will meet for 1-2 three-hour meetings to review the literature, respond to member organization comments, and revise the document as appropriate.

If there are changes or additions to the document that would be unfamiliar or unacceptable to member organizations, it is sent to members to review prior to going to the appropriate steering committee for approval.

Review and Comment Process

ICSI members are asked to review and submit comments for every guideline, order set, and protocol prior to the work group convening to revise the document.

The purpose of the Review and Comment process is to provide an opportunity for the clinicians in the member groups to review the science behind the recommendations and focus on the content of the order set and protocol. Review and Comment also provides an opportunity for clinicians in each group to come to consensus on feedback they wish to give the work group and to consider changes needed across systems in their organization to implement the guideline.

All member organizations are encouraged to provide feedback on order sets and protocol, however responding to Review and Comment is not a criterion for continued membership within ICSI.

After the Review and Comment period, the work group reconvenes to review the comments and make changes as appropriate. The work group prepares a written response to all comments.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Note from the National Guideline Clearinghouse (NGC) and the Institute for Clinical Systems Improvement (ICSI): For a description of what has changed since the previous version of this guidance, refer to Summary of Changes Report -- January 2008.

The recommendations for the diagnosis and treatment of respiratory illness in children and adults are presented in the form of four algorithms with 52 components, accompanied by detailed annotations. Algorithms are provided for: Diagnosis and Treatment of Respiratory Illness in Children and Adults (main algorithm), Pharyngitis, Rhinitis, Sinusitis. Clinical highlights and selected annotations (numbered to correspond with the algorithm) follow.

Class of evidence (A-D, M, R, X) ratings are defined at the end of the "Major Recommendations" field.

Clinical Highlights

- Patients and/or parents of children presenting or calling with symptoms suggestive of the common cold should be evaluated for other symptoms and the presence of more serious illness. *(Annotation #2, 4)*
- The primary treatment of viral upper respiratory infection is education based; education is to take place in the clinic, on the telephone, at the worksite, and in newsletters. Patients and/or parents should receive home care and call back instructions. *(Annotation #13)*
- Reduce unnecessary use of antibiotics. Antibiotic treatment should be reserved for a bacterial illness. *(Annotations #13, 26, 49)*
- Diagnosis of group A beta streptococcal pharyngitis should be made by laboratory testing rather than clinically. *(Annotations #17, 24)*
- Patients should be educated on strep pharyngitis including the importance of following the prescribed medication regimen, use of home remedies to relieve symptoms, actions to take if symptoms worsen, and the importance of eliminating close contact with family members or visitors to the home while group A beta streptococcal may be contagious. *(Annotations #19, 23, 26)*
- Prescribe intranasal steroids for moderate or severe allergic rhinitis. *(Annotation #33)*
- Treat patients diagnosed as having allergic seasonal rhinitis with prophylactic medications and educate about avoidance activities. *(Annotation #33)*
- Consider limited coronal computed tomography scan of sinuses and/or referral to ear, nose and throat provider for patients when three weeks of antibiotic therapy has not produced a response. *(Annotation #50)*

Main Algorithm Annotations

1. **Patient Reports Some Combination of Symptoms**

   Patients may present for an appointment, call into a provider to schedule an appointment or nurse line presenting with respiratory illness symptoms. The symptoms of respiratory illness may include sore throat, rhinorrhea, cough, fever, headache, and/or laryngitis.

2. **Does Patient Have Emergent Symptoms?**

   Key Points:

   - It is recommended that patients with upper-airway obstruction, lower-airway obstruction, and severe headache be seen immediately.

   Recognizing the signs of a serious illness before it becomes life-threatening is usually the medical provider's key concern. Patients should be assessed for upper airway obstruction, lower airway obstruction, severe headache and then the symptoms in Table 1 of the original guideline document, "Symptoms of Serious Illness." An important purpose of Table 1 is to assist providers and triage personnel in distinguishing between respiratory illness and more

serious illness. The urgency index increases with the number and severity of symptoms. Symptoms in Table 1 indicate which patients presenting with respiratory illness symptoms need to be seen immediately by a provider.

Upper Airway Obstruction

Patients with epiglottitis or peritonsillar/retropharyngeal abscess may have signs of upper airway obstruction (stridor, air hunger, respiratory distress, toxic appearance, cyanosis, drooling with epiglottis) and require immediate medical evaluation with combined ear, nose, and throat/anesthesia management in emergency room or operating room setting.

Severe symptoms – including inability to swallow liquids, trismus, drooling without respiratory distress – should receive prompt evaluation by a physician within a reasonable amount of time, depending on the symptoms.

Lower Airway Obstruction

Lower airway obstruction signals an underlying or condition different from respiratory illness. If moderate to severe distress is present, this suggests pneumonia, chronic obstructive pulmonary disease, asthma, foreign body, cardiac condition or other underlying conditions requiring specific evaluation and treatment in an intensive setting. Such symptoms indicate the need for urgent evaluation, and/or the need for intensive treatment, supplemental oxygen, and prolonged observation.

Severe Headache

Severe headache (usually described as the worst headache of their life) could indicate subarachnoid hemorrhage; complications of sinusitis such as cavernous sinus thrombosis or sphenoid sinusitis; meningitis; encephalitis; or other conditions. Such symptoms require prompt, intensive evaluation and care.

3. **See Immediately**

Use algorithm to triage patient symptoms; begin at algorithm box #6 (see original guideline document).

4. **Are Comorbid Conditions Present?**

Key Points:

- Patients with complicating factors should consult with a provider.

This guideline applies to patients in normal health and without severe complicating health factors.

Patients with complicating factors should consult with a provider. The guideline should be applied with great care, if at all, to any patients with

complicating factors. A list of potential complicating factors, though not comprehensive, may include:

- Chronic illness/disease (congestive heart failure, chronic obstructive pulmonary disease, sickle-cell disease, etc.)
- Elderly
- History of rheumatic fever
- Human immunodeficiency virus positive
- Immunocompromised/immunosuppressed
- Patients on chemotherapy
- Asthma
- Diabetes
- Patient started antibiotics prior to diagnosis
- Treatment failure is defined as recurrence of symptoms within seven days of completing antibiotic therapy. Possible reasons include medication noncompliance, repeat exposure, antibiotic resistance, copathogen *[R]*.
- Pregnancy*
- Recurrent streptococcal pharyngitis – recurrence of culture positive group A beta streptococcal pharyngitis more than seven days but within four weeks of completing antibiotic therapy
- Smokers
- Sore throat for more than five days duration

*This guideline should be applied with caution to pregnant women.

Refer to the original guideline document for more information on comorbid conditions.

6. **Are Symptoms Suggestive of Pharyngitis?**

Patients report a sore throat without rhinorrhea, cough, or hoarseness.

Patients with recent strep exposure may be more likely to have group A beta streptococcal pharyngitis.

Signs and symptoms associated with group A beta streptococcal include:

- Sudden onset of sore throat
- Exudative tonsillitis
- Tender anterior cervical adenopathy
- History of fever
- Headache
- Abdominal pain
- No rhinorrhea, cough, hoarseness

Other symptoms sometimes associated with group A beta streptococcal pharyngitis include:

- Vomiting

- Malaise
- Anorexia
- Rash or urticaria

8. **Are Symptoms Suggestive of Rhinitis?**

   Rhinitis is defined as inflammation of the membranes lining the nose and is characterized by nasal congestion, rhinorrhea, sneezing, and itching of the nose and/or postnasal drainage *[R]*.

   Symptoms of allergic rhinitis include:

   - Pruritus of the eyes, nose, palate, and ears
   - Watery rhinorrhea
   - Sneezing
   - Seasonal changes
   - Family history of allergies
   - Sensitivity to specific allergens, especially dust mites, animal dander, pollen, and mold
   - Atopy
   - Nasal congestion
   - Postnasal drip

10. **Are Symptoms Suggestive of Sinusitis?**

    Symptoms include:

    - Upper respiratory symptoms present greater than seven days
    - Two or more of the following factors present at a point of greater than seven days after onset:
      - Cough
      - Documented past history of sinusitis
      - Ear pressure/fullness
      - Facial pain particularly if aggravated by postural changes or by valsalva maneuver
      - Fatigue
      - Fever
      - Hyposmia/anosmia
      - Known anatomical nasal blockage
      - Nasal congestion
      - Nasal drainage
      - Poor response to decongestive
      - Postnasal drip
      - Tenderness over sinus area
      - Tooth pain

12. **Are Symptoms Suggestive of Viral Upper Respiratory Infection?**

    A viral upper respiratory infection (common cold) is a self-limited illness typically lasting 5 to 14 days manifested by rhinorrhea, cough, and fever.

The symptoms may include general malaise, laryngitis, injection of the conjunctiva, decreased appetite, headache, and increased fussiness. Onset of symptoms is rapid. Fever, more commonly seen in children, usually lasts one to three days. Nasal discharge is initially clear and usually becomes yellow or green toward the end of the viral upper respiratory infection; this does not signify a bacterial infection and the patient does not need to be seen. The symptoms of a viral upper respiratory infection usually peak in 3 to 5 days and should resolve in 7 to 14 days. A mild cough may persist at night for two to three weeks.

There was consensus within the work group regarding the symptoms of the viral upper respiratory infection that are not indicative of more serious illness. Medical textbooks and a widely used self-care source also listed essentially the same constellation of symptoms.

For children:

It is not unusual for a child to have five to eight colds a year.

Children with viral upper respiratory infections have some combination of the following symptoms: nasal congestion and discharge, fever, sore throat, cough, laryngitis, mild fussiness or irritability, decrease in appetite, sleep disturbance, and mild eye redness or drainage *[R]*.

It is essential to recognize symptoms that indicate an illness other than, or in addition to, pharyngitis, rhinitis, sinusitis, and viral upper respiratory infection that should be evaluated and treated (see Table 2 in the original guideline document).

Refer to the National Guideline Clearinghouse (NGC) summary of the Institute for Clinical Systems Improvement (ICSI) guideline Diagnosis and Treatment of Otitis Media in Children for a more complete summary of illnesses to be differentiated from the viral upper respiratory infection and associated symptoms *[M]*.

13. **Patient Education/Home Care Call Back Instructions**

Key Points:

- It is recommended that patients, parents and caregivers be educated on prevention, comfort measures, and treatment recommendations for the common cold.
- Patients with a viral illness may be aware of measures to relieve symptoms and reduce spread of infection. It is important to provide them with practical, preferably evidence-based, advice.

Prevention

Although the viral upper respiratory infection is a respiratory illness, researchers have found that viral upper respiratory infections are spread more by hands of the person with a cold and by very close contact than by

droplets in the air. Hand washing is the most effective way to prevent the spread of the common cold (viral upper respiratory infection). Viral upper respiratory infection is most contagious at the onset of symptoms and while febrile *[A]*.

For infants and toddlers:

- Discourage visitors who have an acute illness, a fever, or contagious disease.
- Prevent child with viral upper respiratory infection from sharing toys and pacifier with other children and clean these items with soap and hot water as feasible to reduce opportunities for viral transmission.
- Use and teach good hand washing.
- Ask visitors to wash their hands before holding baby.
- Daycare with three or more families represented is associated with higher incidence of viral upper respiratory infection, ear infections, and lower respiratory infections, therefore:
    - Check to see if staff and children at your child's daycare are being taught good hand washing and other infection control measures (excellent educational materials are available that daycare providers can obtain).
    - Consider daycare options that reduce exposure to other children
        - Relative or friend
        - In-home nanny shared by two families
- Because human milk contains ingredients that help protect babies from infections, encourage and support mothers to continue breast-feeding for an appropriate period.

Refer to the original guideline document for information about comfort measures for infants/children and adults/adolescents.

Treatment Recommendations

Antibiotics

Antibiotics are effective only for treating bacterial infections. Because colds are viral infections, antibiotic use will not cure or shorten their length *[R]*.

Antibiotics cause side effects such as gastrointestinal discomfort, diarrhea, allergic reactions, diaper rash, and yeast infections. Unnecessary use of antibiotics can lead to the development of antibiotic-resistant strains of bacteria.

Over-the-Counter Medications

Over-the-counter cold and cough medications and acetaminophen do not shorten the duration of viral upper respiratory infection.

Children

In April 2007 the Food and Drug Administration issued a warning on using cough and cold medicines in young children. Parents and other caregivers should only administer cough and cold medications to children under two when following the exact advice of their doctor. Clinicians should be certain that caregivers understand both the importance of administering these medications only as directed and the risk of overdose if they administer additional medications that might contain the same ingredient *[R]*.

The Food and Drug Administration does not have approved dosing recommendations for clinicians prescribing cough and cold medications for children two and under *[R]*.

Because of the risk of Reye's syndrome associated with aspirin use in children, acetaminophen should be suggested as the drug of choice for home use.

The fever that frequently accompanies a viral upper respiratory infection in children is not harmful and is usually gone in two to three days. It is the consensus of the work group that fevers persisting beyond that time should be evaluated by a provider. Work group members also agree that infants under three months with fevers should be thoroughly evaluated *[R]*.

Adults

For adults with a cold, over-the-counter products such as nasal sprays, decongestants, and analgesics may provide temporary relief of sore throat, runny nose, coughing, minor aches, and fever. Because of potential side effects, however, be sure to follow the recommended dosage and precautions. Patients who have high blood pressure, diabetes, thyroid disease or, who are pregnant should check with their physician regarding recommendations for decongestant use.

Use medication for discomfort as recommended by a physician or nurse for fever.

General Discomfort, Headache, and Fever Reduction

Aspirin, ibuprofen and naproxen should be avoided by persons who 1) are not eating well (risk of gastrointestinal bleeding); 2) have a history of peptic ulcer or related disorder; 3) have aspirin-sensitive asthma; and 4) have renal dysfunction. For these reasons, plus the risk of Reye's syndrome associated with aspirin use in young, healthy adults, acetaminophen should be suggested as the drug of choice. However, it should be used only as needed because of adverse effects.

In the adolescent/adult studies, the following drugs were found to reduce nasal symptoms: chlorpheniramine maleate (e.g., Chlor-Trimeton®),

pseudoephedrine HCl (e.g., Sudafed®), and oxymetazoline HCl (e.g., Afrin®) *[M]*.

Atrovent is not effective when there is documented significant nasal obstruction. The cost/benefit relationship for Atrovent Nasal Spray is rarely supportive for use of this medication. In addition, it requires physician intervention that consists of phone calls and/or office visits, which significantly increase the cost of care for a benign condition.

Echinacea

Findings in the medical literature do not support the use of echinacea in preventing viral upper respiratory infection. Some preliminary data indicate that echinacea may shorten the course of viral upper respiratory infection; however, studies that produced this data are small. Methods by which echinacea is prepared are not standardized, and actual dose delivered by specific products varies widely. Hence, the work group cannot recommend the use of echinacea in preventing or shortening the duration of viral upper respiratory infection at this time. The work group will continue to evaluate the data on this and other herbal preparations *[A, B]*.

Vitamin C

There is no consistent evidence in the medical literature that high doses of vitamin C help shorten the course of viral upper respiratory infections. Hence, it was the consensus of the work group that high doses of vitamin C should not be recommended.

Zinc

In adults there is some evidence that zinc gluconate may decrease the duration of a cold if started within 24 hours of onset; however, adverse reactions including nausea and bad taste may limit its usefulness. Zinc is not indicated and may be dangerous during pregnancy.

According to the Cochrane Collaborative, overall results of studies of the effect of zinc gluconate on upper-respiratory infection duration and severity have been inconclusive *[M]*.

Refer to the original guideline document for additional information on zinc.

Call Back Instructions

Children three months to 18 years of age

Call back if:

- Fever lasts three days or more
- Symptoms worsen after 3 to 5 days or if new symptoms appear (e.g., increasing symptoms of illness, lethargy, decreased responsiveness, poor eye contact, difficulty breathing)

- Symptoms have not improved after 7 to 10 days; it is not unusual, however, for a mild cough and congestion to continue 14 days or more

Adults

Call back if symptoms worsen after three to five days, new symptoms develop or symptoms do not improve after 14 days.

Pharyngitis Algorithm Annotations

15. **Patient Has Symptoms Suggestive of Pharyngitis**

Patients with recent strep exposure may be more likely to have group A beta streptococcal pharyngitis.

See Annotation #6, "Are Symptoms Suggestive of Pharyngitis?" for the signs and symptoms associated with group A beta streptococcal.

Refer to the original guideline document for information on viral and bacterial causes of acute pharyngitis.

Complications Associated with Untreated Group A Beta Streptococcal

Rheumatic fever is a nonsuppurative complication of group A beta streptococcal pharyngitis *[C]*. One reason for identifying and treating patients with group A beta streptococcal pharyngitis is to decrease the incidence of rheumatic fever *[R]*. The only controlled study demonstrating the possibility of preventing rheumatic fever was done in 1950 in military camps *[C]*. Further longitudinal studies have shown evidence of prevention of rheumatic fever by treatment of group A beta streptococcal with penicillin. Several studies have shown that treatment of patients with group A beta streptococcal pharyngitis shortens the course of the illness *[A]*.

16. **History/Physical**

History and physical findings may increase or decrease the likelihood of a group A beta hemolytic strep as the cause of pharyngitis. Factors increasing the likelihood include abrupt onset, associated fever, headache, abdominal pain (especially in children), presence of tonsillar exudate, primarily anterior cervical adenopathy, and the absence of cough and nasal congestion. These findings are not specific enough for group A strep to allow empiric treatment without testing. On the other hand, lack of these physical findings and history may eliminate the need to do strep testing and focus treatment instead on symptomatic measures.

17. **Collect Specimen for Rapid Strep Test and Backup Culture**

Rapid strep test and strep culture both require proper collection technique by trained professionals and must be performed according to the Federal Clinical Laboratory Improvement Act (CLIA) regulations. Poor collection procedures reduce accuracy of either test. Rapid strep test must also be performed

according to the manufacturer's guidelines. An appropriately performed throat swab touches both tonsillar pillars and the posterior pharyngeal wall. The tongue should not be included (although its avoidance is sometimes technically impossible). Backup strep culture is needed if rapid strep test is negative. The best yield is obtained by using separate swabs for rapid strep test and strep culture.

Backup systems such as polymerase chain reaction (PCR) may also be used.

Refer to the original guideline document for information on advantages and disadvantages of rapid strep test.

19. **Treatment and Education**

Key Points:

- Penicillin (PCN) is the drug of choice for treatment of culture positive cases of group A beta streptococcal pharyngitis.
- In penicillin-allergic patients, options include cephalosporins (for some types of allergies), erythromycin, and clindamycin.

Persistent Infections/Treatment Failure

Treatment of persistent infection should be directed toward eradication of both group A beta streptococcal and beta lactamase-producing protective organisms.

Note: All episodes consist of clinical findings and positive lab tests within seven days after completion of a course of antibiotic therapy.

Recommendations

- Erythromycin
- Cephalexin
- Clindamycin
- Amoxicillin/clavulanate
- Rocephin

[R, A]

A discussion of referral criteria for tonsillectomy in patients with recurrent tonsillitis is outside the scope of this guideline. As a result, the work group suggests physicians refer to one or more sources that offer a detailed discussion of referral criteria *[M, A]*.

Carrier State

Two alternative treatment protocols have been established in the literature as effective in eliminating the carrier state. Clindamycin 20 mg/kg/day in three divided doses (maximum 450 mg/day) x 10 days is the treatment of choice if the decision is made to treat the carrier state. If clindamycin is not a suitable

therapeutic choice, consideration can also be given to penicillin and rifampin *[A]*.

Patients currently on antistreptococcal antibiotics are unlikely to have streptococcal pharyngitis. Antibiotics not reliably antistreptococcal include sulfa medications, nitrofurantoin, and tetracycline.

Refer to the original guideline document for information on patients who are streptococcal carriers.

20. **Symptoms Improved Within 48 to 72 Hours?**

    After initiating a course of an appropriate antibiotic, improvement in symptoms related to group A streptococcal pharyngitis should be seen by 48 to 72 hours.

    It is suggested that the patient be instructed to call in to the provider's office by 72 hours to confirm, or that the provider's office contacts the patient to verify improvement.

21. **Complete Treatment**

    It is important to emphasize to the patient that completion of the course of antibiotic is important to reduce risk of recurrence.

22. **Consider Re-Evaluation/Broad Spectrum Culture/Mono Testing, If Appropriate/Empirical Antibiotic Therapy**

    If symptoms have not improved by 72 hours, there should be consideration of re-evaluation of the patient. This may be needed particularly to exclude peritonsillar cellulitis or abscess. The causative organisms in those cases are unlikely to be strep, and therefore an empiric change in antibiotic or referral to ear, nose, and throat provider may be indicated. A broad spectrum culture can be obtained to exclude other potential pathogens such as Group C or G strep. If clinically indicated, testing for mononucleosis may be appropriate, keeping in mind that screening tests for mononucleosis may not be positive until several days into the illness.

23. **Education for Home Remedies**

    Key Points:

    - Treatment failure for group A beta streptococcal is rare.
    - Education is needed on home remedies for sore throats.
    - The patient should be instructed to call back if the symptoms worsen or if they persist beyond five to seven days.

    When a patient currently on antibiotics (other than sulfa, tetracycline, nitrofurantoin or other non-strep antibiotics) is taking the medication as prescribed and develops a sore throat, chances are that the sore throat is caused by something other than group A beta streptococcal.

Home remedies include the following:

- Take acetaminophen or ibuprofen. Do not use aspirin with children and teenagers because it may increase the risk of Reye's syndrome.
- Gargle with warm salt water (1/4 teaspoon of salt per 8 ounce glass of water).
- Adults or older children may suck on throat lozenges, hard candy, or ice.
- Eat soft foods.
- Drink cool beverages or warm liquids.
- Suck on flavored frozen desserts (such as popsicles).

Health education resources are listed in the Support for Implementation section of the original guideline document.

24. **Consider Strep Culture**

Key Points:

- Empiric treatment of group A beta streptococcal is discouraged due to poor diagnostic accuracy even with elaborate clinical scoring systems.
- Poor sample collection reduces the accuracy and clinical value of both rapid strep test and strep culture. Separate swabs should be used to collect the samples for rapid strep test and strep culture.
- Rapid strep test is useful but does not have sufficient sensitivity to be used alone. Strep culture is the most sensitive test for group A beta streptococcal, but treatment needs to be delayed until the test results are available.
- Rapid strep test followed by strep culture has the highest positive predictive value that the patient actually has the illness.

If a rapid strep test is not available or the results are negative, a strep culture should be performed. Generally treatment should be delayed until the culture results are available. Results are usually available within 24 hours or slightly less, but may require incubation for longer periods of time. Some clinicians choose to initiate treatment prior to culture result availability, but a full course of treatment should not be prescribed until culture results confirm the presence of group A beta streptococcal *[R]*.

Treatment of group A beta streptococcal pharyngitis is accurate when based on rapid strep test or strep culture results. Even with elaborate clinical scoring systems, diagnostic accuracy (probability of group A beta streptococcal) is only 50%, increasing to 75% if white blood count results are included in decision making. For this reason, empiric treatment is discouraged; several professional societies recommend treatment based solely on culture results.

Refer to the original guideline document for information on advantages and disadvantages of strep culture, short-term treatment awaiting culture, and empirical treatment *[C]*.

25. **Strep Culture Result?**

Whether or not the test is positive, patients and their families want to know results as soon as possible so that they can appropriately plan for their needs.

- If negative, they need educational information and a planned course of action if they do not recover in a reasonable time frame or if they become more ill.
- If positive, patients want to be started on medication as rapidly as possible, primarily as a comfort or convenience issue and to reduce contagion. Rheumatic fever prophylaxis is likely satisfactory if started within a week of the positive culture; however, patients and parents may perceive any delay in initiation of treatment as poor service.

26. **Educate on Non-Group A Beta Streptococcal Pharyngitis Symptoms**

If the rapid strep test and/or the strep culture are negative, the patient needs to be educated on non-strep sore throats. This includes the duration of the symptoms, ineffectiveness of antibiotic treatment, and home remedies that will ease the symptoms. The patient should be instructed to call back if the symptoms worsen or if they persist beyond five to seven days.

Home remedies include the following:

- Eat soft foods.
- Drink cool beverages or warm liquids.
- Suck on flavored frozen desserts (such as popsicles).

Provide educational material about non-strep causes of sore throats and home remedies for the patient to take home. See Annotation #23, "Education for Home Remedies" for additional information. Health education resources are included in the Support for Implementation section of this guideline.

27. **Symptoms Improved?**

Non-group A beta streptococcal would generally be expected to be improving over a period of a few days. Patients should be instructed to contact their provider if symptoms are persisting.

28. **Continue With Home Care**

Home care measures to alleviate symptoms should be continued as needed. See Annotation #23, "Education for Home Remedies" for additional information.

29. **Consider Re-evaluation/Broad Spectrum Culture/Mono Testing, if Appropriate**

See Annotation #22, "Consider Re-Evaluation" for details.

Rhinitis Algorithm Annotations

31. **History/Physical**

Exposure to triggers in the environment is a crucial point in the history. Home, school, work, day care and other frequent exposures should be reviewed.

The following points in the history and physical are relevant to rhinitis:

History of Present Illness:

- Congestion or obstruction
- Rhinorrhea (anterior nasal discharge)
- Pruritus of nose or eyes
- Sneezing
- Posterior nasal discharge with or without cough
- Sinus pressure/pain
- Snoring
- Episodic or seasonal or perennial symptoms; consider specific triggers*
- Pregnancy
- Current medications such as topical decongestants, hormones, antihypertensives, antibiotics
- Current and previous treatments for rhinitis

Past Medical History:

- History of trauma or facial/sinus surgery
- Relevant medical conditions: asthma, dermatitis, chronic sinusitis, chronic or recurrent otitis media
- History of polyps and aspirin/non-steroidal anti-inflammatory drug (ASA/NSAID) sensitivity

Family History:

- Asthma
- Rhinitis
- Atopic dermatitis

Social and Environmental History:

- Occupational exposures*
- Home exposures*
- Active and passive smoking exposures
- School exposures
- Illicit drug exposures

*Refer to Appendix A, "Rhinitis Triggers" in the original guideline document

Physical Examination

The physical exam can have any combination of signs noted. Swollen nasal turbinates (congestion), rhinorrhea, and pruritus tend to be the most

common. Allergic conjunctivitis may also be present with red, watery, pruritic eyes.

Atrophic rhinitis is characterized by foul-smelling nasal crusting and sinus pain and is usually related to atrophy, excessive nasal and sinus surgery, radiation or one of several rare diseases such as Wegner's granulomatosis.

Refer to the original guideline document for details on physical examination.

32. **Signs and Symptoms Suggest Allergic Etiology?**

Refer to the original guideline document for description of signs and symptom suggestive of an allergic etiology, nonallergic rhinitis, or both.

33. **Initiate Symptomatic Treatment/Allergen Avoidance/Medication Therapy**

Diagnostic Testing

The clinician may choose to conduct diagnostic testing at this point if the results would change management.

The following are recommended:

- **Skin tests and radioallergosorbent tests**: Skin tests and radioallergosorbent tests identify the presence of immunoglobulin E (IgE) antibody to a specific allergen. There are two major reasons to consider allergy testing: to differentiate allergic from nonallergic rhinitis, and to identify specific allergens causing allergic rhinitis. A limited panel of two to four radioallergosorbent tests should be considered. If a greater number of specific allergens is to be identified, skin tests are the preferred diagnostic tests. Skin tests are faster, more sensitive, and more cost effective. Skin tests require experience in application and interpretation, and carry the risk of anaphylactic reactions. Therefore, only specially trained physicians should perform them. The precise sensitivity of specific IgE immuno-assays such as radioallergosorbent test compared with prick/puncture skins tests has been reported to range from less than 50% to greater than 90% with the average being about 70% to 75% for most studies. Therefore, skin tests are presently the preferred test for the diagnosing of IgE-mediated sensitivity *[C, R]*.
- **Nasal smear for eosinophils**: Nasal smear may be a low-cost screening tool to detect eosinophils. While eosinophils may be present in both allergic and nonallergic rhinitis, eosinophilia predicts a good response to topical nasal corticosteroid medication. This test must be done during the actual symptomatic period to yield interpretable results *[A, D, R]*.
- **Other tests**: Blood eosinophilia has little diagnostic value in the evaluation of nasal allergies and is generally not helpful in the differential diagnosis. Total IgE concentrations provide only modest information about the risk of allergic disease. According to the

American Academy of Allergy and Immunology and the National Center for Health Care Technology, sublingual provocation testing is unproven and experimental. These tests are therefore not recommended *[R]*.

A peripheral blood eosinophil count, total serum IgE level, Rinkel method of skin titration and sublingual provocation testing are not recommended *[B, C, R]*.

Symptomatic Treatment

If the clinical diagnosis is obvious, symptomatic treatment should be initiated. Symptomatic treatment includes both education on avoidance and medication therapy.

Avoidance Activities: Identifying avoidable allergens by skin test or radioallergosorbent test will enhance a patient's motivation to practice avoidance. Some avoidance activities require significant financial investment or substantial lifestyle changes by the patient. Before recommending such measures, it may be useful to recommend skin testing or limited radioallergosorbent test testing to confirm the diagnosis and to identify the specific allergen.

Refer to the original guideline document for information on house dust mites, changes to reduce mite exposure, pets, mold, and pollens.

Medication Therapy

As with the chronic use of any medications, special consideration of risk benefit may need to be given to elderly, fragile patients, pregnant women, athletes, and children.

The following medications are used for patients with allergic rhinitis:

- Corticosteroids
- Antihistamines
- Decongestants
- Cromolyn
- Anticholinergics
- Ophthalmic medications

Refer to the original guideline document for detailed information on these medications.

34. **Symptoms Improved?**

If symptoms have not improved after two to four weeks, the clinician should consider issues affecting compliance, and alternative medication therapy.

35. **Patient Education/Follow-Up As Appropriate**

If the patient has adequate relief of rhinitis and associated allergic symptoms either by instituting avoidance measures or through a medication trial, appropriate follow-up should include:

- Further education and review of information about avoidance activities.
- Education and review of appropriate use of medications and possible side effects.
- Advice to anticipate unavoidable exposure to known allergens by beginning use of medications prior to exposure. For example, taking oral antihistamines prior to visiting a home with a cat or dog, if sensitive to their dander, can prevent symptoms. Starting intranasal corticosteroids one to two weeks prior to the start of the ragweed pollen season will maximize benefits of the medication in people with seasonal allergic rhinitis symptoms in the late summer.

Adequate follow-up may require a separate provider visit or a follow-up phone call or may be accomplished during another clinic visit. Use of appropriate educational handouts and materials may be helpful.

Patient education materials can be found in the Support for Implementation section of the original guideline document.

36. **Consider Further Diagnostic Testing/Referral to Specialty Provider**

When the patient has not experienced relief of symptoms within two to four weeks of adequate therapy, the provider should:

- Review obstacles to compliance with current medication and discuss avoidance measures.
- Consider a trial of another medication or add another agent for targeted symptoms.
- Consider allergen skin testing by a qualified physician. If there are positive skin tests to allergens that correlate with the patient's timing of symptoms, immunotherapy may be considered.
- Consider complete nasal examination (rhinoscopy) by a qualified individual to rule out a mass or lesion, particularly if obstruction and congestion are the major symptoms.
- Consider diagnosis of nonallergic rhinitis.

Immunotherapy

Immunotherapy should be generally reserved for patients with significant allergic rhinitis for whom avoidance measures and pharmacotherapy are insufficient to control symptoms. Other candidates for immunotherapy include patients who have experienced side effects from medication or who cannot comply with a regular (or prescribed) pharmacotherapy regimen or who develop complications such as recurrent sinusitis.

All immunotherapy injections should be administered in a medical facility where personnel, equipment and medications are available to treat an anaphylactic reaction to an injection. Because there is a risk of anaphylaxis

with every injection during the buildup or maintenance phases of treatment, regardless of the duration of treatment, the patient should be advised to wait in the physician's office or clinic for 30 minutes after the injection.

Patient education materials can be found in the Support for Implementation section of the original guideline document.

Immunotherapy injections are most effective for allergic rhinitis caused by pollens and dust mites. They may be less effective for mold and animal dander allergies *[A, R]*.

37. **Signs and Symptoms Suggest Structural Etiology**

See original guideline document for suspected abnormalities, which require a complete nasal examination including visualization of the posterior nasopharynx.

39. **Nonallergic Rhinitis**

Symptoms of nonallergic rhinitis are similar to those of allergic rhinitis and may include nasal congestion, postnasal drainage, rhinorrhea, and even sneezing. Examples of nonallergic rhinitis include hormonal, such as rhinitis of pregnancy; sensitivity to smells and temperature changes; nonallergic rhinitis eosinophilic syndrome; rhinitis medicamentosa from regular use of topical nasal decongestants; and atrophic rhinitis.

40. **Initiate Symptomatic Treatment**

Treatment of symptomatic nasal obstruction due to nonallergic rhinitis includes the following:

- Azelastine hydrochloride nasal spray
- Intranasal corticosteroid spray
- Oral decongestant
- Oral antihistamines
- Breathe Right® nasal strips
- Topical antihistamines

[A]

Treatment of symptomatic nonpurulent chronic posterior nasal drainage (postnasal drip) includes the following:

Conservative Treatment:

- Increase water intake
- Decrease caffeine and alcohol intake (both have a diuretic effect)
- Nasal saline irrigation. Nasal saline irrigations can be purchased over the counter (brand names: Ocean, Salinex). A saline nasal irrigation solution can be made

at home by mixing 1/4 teaspoon table salt into one cup of water.
- Determine whether the patient is using any medications that may cause oral or nasal dryness.
- Vaseline or antibiotic ointment may be used for nasal crusting.
- Add humidity in bedroom if significantly less than 50%.

Medical Treatment:

- Intranasal corticosteroids

Treatment of symptomatic bilateral chronic anterior rhinorrhea due to nonallergic rhinitis includes the following:

- Avoidance of offending irritants such as smoke and perfume
- Intranasal corticosteroids
- Atrovent spray
- Nasal saline

41. **Symptoms Improved?**

If symptoms have not improved within two to six weeks, the clinician should consider issues of compliance, alternative medical treatment, or referral to a specialty provider.

42. **Consider Referral to Specialist**

Nasal examinations are generally done by an ear, nose, and throat specialist but may be done by a physician trained in endoscopic fiberoptic rhinoscopy. A computed tomography scan may be helpful at this time.

If chronic sinusitis remains in the differential diagnosis, antibiotic therapy should be instituted prior to radiological examination.

Sinusitis Algorithm Annotations

44. **Patient Has Symptoms Suggestive of Sinusitis**

Acute sinusitis may be present when:

- Upper respiratory symptoms have been present for at least seven days, **AND**
- Two or more of the following four factors are present at a point seven days or more after the onset of the illness:
    - Colored nasal drainage
    - Poor response to decongestant
    - Facial pain or sinus pain, particularly if aggravated by postural change or valsalva maneuver
    - Headache

The diagnosis of acute sinusitis is based primarily on the patient's presenting symptoms and history, and is supported by the physical exam.

The clinician's overall clinical impression has been found to accurately predict acute sinusitis when the probability of sinusitis is high. Physical examination may assist in diagnosis (i.e., purulent upper respiratory secretions, maxillary dental pain/facial pain, nasal congestion and/or polyposis) *[C, R]*.

45. **Schedule Visit within 24 to 48 Hours**

An individual reporting symptoms for acute sinusitis has a reasonably high likelihood of having the disease.

- Fever greater than 102 degrees and a documented past history of sinusitis in addition to the above symptoms are supportive of a sinusitis diagnosis.
- Tooth pain not of dental origin with any of the above findings is a more specific indication of sinusitis.
- Severe symptoms should be considered for treatment before seven days.
- Known anatomical blockage (e.g., chronic nasal polyps, severely deviated septum, recurrent sinusitis) may need immediate treatment.
- Patients on antibiotics for two or more days, whose sinus symptoms are worsening, should be scheduled for a provider visit.

It is the opinion of the work group that phone management/home care of the patient with presumed sinusitis should be limited to a select group of patients. This group includes patients with the following characteristics:

- Generally good health
- Mildly ill
- Established patient
- Patient is comfortable with phone management
- History of previous sinusitis treated successfully
- Earlier visit for treatment of viral upper respiratory infection

Patients with any one of the following complicating factors require emergent care:

- Orbital pain
- Visual disturbances
- Periorbital swelling or erythema
- Facial swelling or erythema
- Signs of meningitis or "worst headache of my life"

46. **History/Physical**

Review History

Regional Exam of the Head and Neck

The following physical findings may be present:

- Purulent nasal drainage
- Sinus tenderness
- Decreased transillumination (optional)

Assess for Complicating Factors – More Intensive Treatment May Be Indicated

- Local

  External facial swelling/erythema over involved sinus

  Involvement of frontal sinus or symptoms of sinus impaction

- Orbital

  Visual changes

  Extraocular motion abnormal

  Proptosis

  Periorbital inflammation/soft tissue edema

  Periorbital erythema/cellulites (subperiosteal abscess, orbital cellulites, orbital abscess)

- Intracranial, central nervous system complications

  Cavernous sinus thrombosis

  Meningitis

  Subdural empyema

  Brain abscess

Plain sinus x-rays and other imaging are usually not necessary in making the diagnosis of acute sinusitis.

Maxillary antrum aspiration for culture is indicated only when precise microbial identification is required.

Refer to the original guideline document for more information on transillumination, plain sinus x-rays, and maxillary antrum aspiration.

The goal of treatment is to promote adequate drainage of the sinuses. This in turn will provide relief of symptoms associated with sinusitis. This may require a combination of home care and medical treatments.

48. **Home Self-Care**

Patients who are in generally good health and only mildly ill may be appropriate candidates for home care/phone management of presumed acute sinusitis. Both the patient and the provider should be comfortable with home care/phone management. The following factors are also supportive of home care/phone management:

- Established patient (has been seen by primary care physician within the past year)
- History of previous sinusitis treated successfully
- Earlier visit with viral upper respiratory infection that has progressed to probable acute sinusitis

The patient should be instructed to implement the following comfort and prevention measures:

Home Self-Care Measures

Maintain adequate hydration (drink 6 to 10 glasses of liquid a day to thin mucus)

Steamy shower or increase humidity in the home.

Apply warm facial packs (warm wash cloth, hot water bottle, or gel pack) for 5 to 10 minutes three or more times per day.

Localized pain and tenderness are common and may require analgesics.

Saline irrigation (saline nose drops, spray to thin mucus) can provide moisture and improve mucociliary function.

Decongestants (topically or orally)

- Pseudoephedrine HCl (e.g., Sudafed) 60 mg every 4 to 6 hours, not to exceed four doses per 24 hours.
- Decongestant nasal sprays for no longer than three days, e.g., oxymetazoline (Afrin), phenylephrine HCl (Neosynephrine)

Antihistamines

Antihistamines are not recommended for the treatment of sinusitis because they cause further inspiration of secretions *[R]*.

Adequate rest

Sleep with head of bed elevated.

Avoid cigarette smoke and extremely cool or dry air.

Prevention Measures

Appropriate treatment of allergies and viral upper respiratory infections can prevent the development of sinusitis.

Environmental factors that affect the sinuses include cigarette smoke, pollution, swimming in contaminated water, and barotrauma.

49. **Treatment**

Nasal Steroid Spray

Intranasal corticosteroid spray may be rational but is an unproved adjunctive therapy for acute sinusitis. The spray may be appropriate for selected cases of recurrent sinusitis, especially in the presence of an allergy or inflammation etiology *[A]*.

Antibiotics

Antibiotics should be reserved for those patients who failed decongestant therapy, those who present with symptoms and signs of a more severe illness, and those who have complications of acute sinusitis *[R]*.

Amoxicillin is the initial drug of choice. Antibiotics such as amoxicillin/clavulanate, cephalosporins and the newer macrolides have theoretic advantages when beta-lactamase producing organisms are present. However, numerous studies have shown no efficacy advantage with these extended spectrum antibiotics compared to amoxicillin even when beta-lactamase producing organisms are present. In patients who are allergic to penicillin, trimethoprim-sulfamethoxazole should be the alternative. Generally quinolone antibiotics should not be used since they are relatively inactive against pneumococci *[A, C, R]*.

Duration of Antibiotics

The duration of antibiotic therapy is controversial with recommendations from various sources being anywhere from 3 to 14 days. A 10-day course of antibiotics is recommended since this duration of antibiotics has been used in the vast majority of clinical trials in sinusitis. Also it has been shown that 10 days of antibiotics will achieve a bacteriologic cure as defined by follow-up sinus puncture *[R]*.

Amoxicillin

For those allergic to amoxicillin

Trimethoprim-sulfamethoxazole (trimethoprim-sulphamethoxazor).

Amoxicillin is a potential first line agent. Yet in areas of *Streptococcus pneumoniae* resistance greater than 10%, providers should consider high-dose amoxicillin or a second-line agent.

Trimethoprim-sulfamethoxazole is a potential first line antibiotic. However, some providers may choose to avoid this medication because of concerns about resistant *S. pneumoniae*. As a result, trimethoprim- sulfamethoxazole should primarily be considered for patients who are allergic to amoxicillin unless there are specific clinical circumstances in which its use is warranted.

For patients allergic to both amoxicillin and trimethoprim-sulfamethoxazole, macrolides can be prescribed. A cephalosporin could be considered but there is approximately a 10% cross-reaction between cephalosporins and amoxicillin.

It is important to instruct the patient to complete the course of antibiotics.

The duration of antibiotic therapy is controversial. Studies have shown effectiveness with 3 to 14 days. Most studies have used a 10-day course of antibiotics.

Call Back Instructions

The patient should be instructed to call back if symptoms worsen, or if symptoms have not resolved within one week.

50. **Treatment Failure?**

Complete Response

Patient is symptomatically improved to near normal.

Partial Response

Patient is symptomatically improved but not back to normal at the end of the first course of antibiotics. An additional 10 to 14 days of amoxicillin 500 mg three times a day or 875 mg twice daily.

or

Trimethoprim-sulfamethoxazor: one double-strength tablet twice daily x 10 to 14 days.

Reinforce the comfort and prevention measures outlined in Annotation #48, "Home Self-Care."

Partial response is assessed at the end of 10 to 14 days by provider visit or phone call.

Failure or No Response

Patient has little or no symptomatic improvement after finishing a 10-day course of first-line antibiotic therapy (amoxicillin or trimethoprim-sulfamethoxazor).

Failure or No Response to Initial Antibiotic

After 10 to 14 days of failure of first-line antibiotic (amoxicillin or trimethoprim-sulfamethoxazor), an antibiotic that covers resistant bacteria should be prescribed.

Amoxicillin/clavulanate (Augmentin®)

or

For patients allergic to both amoxicillin and trimethoprim-sulfamethoxazor:

Macrolides can be prescribed as outlined below.

A cephalosporin may be considered, however, there is approximately a 10% cross-reaction between cephalosporins and amoxicillin.

A fluoroquinolone with pneumococcal coverage may also be considered.

Patients who have been treated with multiple courses of either amoxicillin or trimethoprim-sulfamethoxazor over the past year, even if not within the past month, would likely be best treated with an agent that is more likely to cover resistant organisms including penicillin-resistant pneumococci.

Refer to the original guideline document for information on second-line antibiotics, and U.S. Food and Drug Administration (FDA) approved antibiotics.

Reinforce the comfort and prevention messages outlined in Annotation #48, "Home Self-Care."

After 10 to 14 days of failure of first-line antibiotic (amoxicillin or trimethoprim-sulfamethoxazor), an antibiotic should be prescribed that would cover potentially resistant bacteria occasionally seen in acute bacterial sinusitis.

Failure or No Response in Three Weeks

In patients who have not responded to three weeks of continuous antibiotic therapy, consider limited coronal computed tomography scan of sinuses and/or referral to ear, nose and throat provider.

Please see individual health plan for formulary information.

In patients who fail to respond to three weeks of continuous antibiotic therapy, referral to an ear, nose and throat provider would be indicated to rule out a structural abnormality.

Definitions:

Classes of Research Reports:

A. Primary Reports of New Data Collection:

Class A:

- Randomized, controlled trial

Class B:

- Cohort study

Class C:

- Non-randomized trial with concurrent or historical controls
- Case-control study
- Study of sensitivity and specificity of a diagnostic test
- Population-based descriptive study

Class D:

- Cross-sectional study
- Case series
- Case report

B. Reports that Synthesize or Reflect upon Collections of Primary Reports

Class M:

- Meta-analysis
- Systemic review
- Decision analysis
- Cost-effectiveness analysis

Class R:

- Consensus statement
- Consensus report
- Narrative review

Class X

- Medical opinion

CLINICAL ALGORITHM(S)

Detailed and annotated clinical algorithms are provided for:

- Diagnosis and Treatment of Respiratory Illness in Children and Adults (main algorithm)
- Pharyngitis
- Rhinitis
- Sinusitis

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is classified for selected recommendations (see "Major Recommendations").

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

- Increased appropriateness of patient visits for viral upper respiratory infection, increased patient/caregiver knowledge of effective home treatment of cold symptoms and decreased inappropriate use of antibiotics in patients with cold symptoms
- Reduced excessive antibiotic treatment through decreased empiric treatment of patients with pharyngitis
- Increased use of recommended first-line medications for patients with pharyngitis and increased patient/caregiver knowledge about pharyngitis and pharyngitis care
- Increased use of prophylactic medications and decreased use of injectable corticosteroid therapy for patients with allergic rhinitis
- Increased use of first-line antibiotics when indicated for patients with sinusitis

POTENTIAL HARMS

Rapid strep-test can render false positive results.

Adverse Effects Associated with Medications

- *Over-the-counter nasal sprays and decongestants* have potential side effects. Adverse effects of oral decongestants include irritability, tremor, insomnia, tachycardia, and hypertension.
- *Antibiotics* cause side effects such as gastrointestinal discomfort, diarrhea, allergic reactions, diaper rash, and yeast infections. Unnecessary use of antibiotics can lead to the development of antibiotic-resistant strains of bacteria.
- *Aspirin* use in children and adolescents is associated with Reye's syndrome.

- The most common side effects of *intranasal corticosteroids* are nasal irritation (dryness, burning and crusting) and mild epistaxis. Documented systemic side effects are rare. Nasal septal perforation has been reported. The Food and Drug Administration (FDA) reviewed data that suggested growth may be temporarily slowed in children.
- Common side effects of the *first-generation antihistamines* include somnolence, diminished alertness and anticholinergic effects such as dry mouth, blurred vision and urinary retention. They can also cause central nervous system impairment and impair driving performance. The *second-generation antihistamines* are less sedating and cause less central nervous system impairment because they do not cross the blood brain barrier well. Side effects of *topical antihistamines* include drowsiness and bitter taste.
- Adverse effects of *cromolyn* are minimal and include nasal irritation, sneezing, and unpleasant taste.
- Side effects of *anticholinergics* include epistaxis, blood-tinged mucus, nasal dryness, dry mouth and throat, dizziness, ocular irritation, blurred vision, precipitation or worsening of narrow angle glaucoma, urinary retention, prostatic disorders, tachycardia, constipation, and bowel obstruction.
- Side effects of *ophthalmic medications* (except corticosteroids) are generally mild and include a brief stinging burning sensation.
- *Immunotherapy injections* are associated with a risk of anaphylaxis during the buildup or maintenance phase of treatment.

Subgroups Most Likely to Be Harmed

- *Aspirin, ibuprofen, and naproxen* should be avoided by persons who: 1) are not eating well (risk of gastrointestinal bleeding); 2) have a history of peptic ulcer or related disorder; 3) have aspirin-sensitive asthma; and 4) have renal dysfunction.
- Patients who have high blood pressure, diabetes, thyroid disease, or are pregnant should check with their physician regarding recommendations for *decongestant* use.
- The anticholinergic side effects of the *first-generation antihistamines* are of more concern in people over 65 years old.
- Parents and other caregivers should only administer cough and cold medications to children under two when following the exact advice of their doctor.
- Zinc is not indicated and may be dangerous during pregnancy.

CONTRAINDICATIONS

CONTRAINDICATIONS

Antihistamines are contraindicated for patients with recurrent or chronic sinusitis as they may cause ciliary paresis and drying of secretions, thereby impairing sinus drainage.

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

- This clinical guideline is designed to assist clinicians by providing an analytical framework for the evaluation and treatment of patients, and is not intended either to replace a clinician's judgment or to establish a protocol for all patients with a particular condition. A guideline will rarely establish the only approach to a problem.
- This clinical guideline should not be construed as medical advice or medical opinion related to any specific facts or circumstances. Patients are urged to consult a health care professional regarding their own situation and any specific medical questions they may have.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

Once a guideline is approved for release, a member group can choose to concentrate on the implementation of that guideline. When four or more groups choose the same guideline to implement and they wish to collaborate with others, they may form an action group.

In the action group, each medical group sets specific goals they plan to achieve in improving patient care based on the particular guideline(s). Each medical group shares its experiences and supporting measurement results within the action group. This sharing facilitates a collaborative learning environment. Action group learnings are also documented and shared with interested medical groups within the collaborative.

Currently, action groups may focus on one guideline or a set of guidelines such as hypertension, lipid treatment and tobacco cessation.

Detailed measurement strategies are presented in the original guideline document to help close the gap between clinical practice and the guideline recommendations. Summaries of the measures are provided in the National Quality Measures Clearinghouse (NQMC).

IMPLEMENTATION TOOLS

Clinical Algorithm
Pocket Guide/Reference Cards
Quality Measures

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

RELATED NQMC MEASURES

- Diagnosis and treatment of respiratory illness in children and adults: percentage of patients with an office visit for cold symptoms who have had symptoms for less than seven days and who receive an antibiotic.
- Diagnosis and treatment of respiratory illness in children and adults: percentage of encounters for cold symptoms (phone care and/or office visits) for which there is documentation of home treatment education.

- Diagnosis and treatment of respiratory illness in children and adults: percentage of patients with a diagnosis of pharyngitis who had strep screen testing.

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)

Institute for Clinical Systems Improvement (ICSI). Diagnosis and treatment of respiratory illness in children and adults. Bloomington (MN): Institute for Clinical Systems Improvement (ICSI); 2008 Jan. 71 p. [175 references]

ADAPTATION

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

DATE RELEASED

1994 Jun (revised 2008 Jan)

GUIDELINE DEVELOPER(S)

Institute for Clinical Systems Improvement - Private Nonprofit Organization

GUIDELINE DEVELOPER COMMENT

Organizations participating in the Institute for Clinical Systems Improvement (ICSI): Affiliated Community Medical Centers, Allina Medical Clinic, Altru Health System, Aspen Medical Group, Avera Health, CentraCare, Columbia Park Medical Group, Community-University Health Care Center, Dakota Clinic, ENT Specialty Care, Fairview Health Services, Family HealthServices Minnesota, Family Practice Medical Center, Gateway Family Health Clinic, Gillette Children's Specialty Healthcare, Grand Itasca Clinic and Hospital, HealthEast Care System, HealthPartners Central Minnesota Clinics, HealthPartners Medical Group and Clinics, Hutchinson Area Health Care, Hutchinson Medical Center, Lakeview Clinic, Mayo Clinic, Mercy Hospital and Health Care Center, MeritCare, Mille Lacs Health System, Minnesota Gastroenterology, Montevideo Clinic, North Clinic, North Memorial Care System, North Suburban Family Physicians, Northwest Family

Physicians, Olmsted Medical Center, Park Nicollet Health Services, Pilot City Health Center, Quello Clinic, Ridgeview Medical Center, River Falls Medical Clinic, Saint Mary's/Duluth Clinic Health System, St. Paul Heart Clinic, Sioux Valley Hospitals and Health System, Southside Community Health Services, Stillwater Medical Group, SuperiorHealth Medical Group, University of Minnesota Physicians, Winona Clinic, Ltd., Winona Health

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GUIDELINE COMMITTEE

Respiratory Steering Committee

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Work Group Members: Leonard Snellman, MD (Work Group Leader) (Health Partners Medical Group) (Pediatrics); David Graft, MD (Park Nicollet Health Services) (Allergy); William Avery, DO (Sanford Health) (ENT); Jeffrey Jenkins, MD (Sanford Health) (Family Practice); Heather Krueger, MD (Quello Clinic) (Family Practice); Carolyn Sparks, MD (University of Minnesota) (Family Practice); Peter Marshall, PharmD (HealthPartners) (Pharmacy); Teresa Hunteman, RRT, CPHQ (Institute for Clinical Systems Improvement) (Measurement/Implementation Advisor); Melissa Marshall, MBA (Institute for Clinical Systems Improvement) (Facilitator)

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David Graft received consulting or speaker fees, conference fees, and travel support for asthma-related projects.

No other work group members have potential conflicts of interest to disclose.

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GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Diagnosis and treatment of respiratory illness in children and adults. Bloomington (MN): Institute for Clinical Systems Improvement (ICSI); 2007 Jan. 71 p.

GUIDELINE AVAILABILITY

Electronic copies: Available from the Institute for Clinical Systems Improvement (ICSI) Web site.

Print copies: Available from ICSI, 8009 34th Avenue South, Suite 1200, Bloomington, MN 55425; telephone, (952) 814-7060; fax, (952) 858-9675; Web site: www.icsi.org; e-mail: icsi.info@icsi.org.

AVAILABILITY OF COMPANION DOCUMENTS

The following are available:

- Diagnosis and management of asthma. Executive summary. Bloomington (MN): Institute for Clinical Systems Improvement, 2008 Mar. 1 p. Electronic copies: Available from the Institute for Clinical Systems Improvement (ICSI) Web site.
- ICSI pocket guidelines. May 2007 edition. Bloomington (MN): Institute for Clinical Systems Improvement, 2007.

Print copies: Available from ICSI, 8009 34th Avenue South, Suite 1200, Bloomington, MN 55425; telephone, (952) 814-7060; fax, (952) 858-9675; Web site: www.icsi.org; e-mail: icsi.info@icsi.org.

PATIENT RESOURCES

None available

NGC STATUS

This summary was completed by ECRI Institute on June 30, 1999. The information was verified by the guideline developer on August 4, 1999. This summary was updated by ECRI on October 13, 2000, December 4, 2002 and on April 18, 2003. The updated information was verified by the guideline developer

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