

antibiotics shorten the duration of sore throat by 1 to 2 days, but the benefit is modest and the number needed to treat to reduce symptoms is 6 after 3 days of treatment and 21 after 1 week of treatment (40). Evidence suggests that antibiotics may prevent complications from group A streptococcal infection, including acute rheumatic fever (which is more common in children and adolescents than adults), peritonsillar abscess, and further spread of group A *Streptococcus* in outbreaks (40). However, little evidence supports the prevention of acute glomerulonephritis (40). Antibiotics are not recommended for chronic group A *Streptococcus* carriers because they are unlikely to spread infection to close contacts and are at little or no risk for complications. Tonsillectomy solely to reduce the frequency of group A streptococcal pharyngitis in adults is not recommended (13).

Adult patients with sore throat should be offered analgesic therapy, such as aspirin, acetaminophen, nonsteroidal anti-inflammatory drugs, and throat lozenges, which can help reduce pain. Salt water, viscous lidocaine, and other mixtures are often used in clinical practice for topical pain relief, but there are few data examining these approaches. Patients can be assured that the typical course of a sore throat is less than 1 week and that antibiotics are usually not needed because they do little to alleviate symptoms and may have adverse effects (12, 13, 40).

High-Value Care Advice 2

Clinicians should test patients with symptoms suggestive of group A streptococcal pharyngitis (for example, persistent fevers, anterior cervical adenitis, and tonsillopharyngeal exudates or other appropriate combination of symptoms) by rapid antigen detection test and/or culture for group A Streptococcus. Clinicians should treat patients with antibiotics only if they have confirmed streptococcal pharyngitis.

ACUTE RHINOSINUSITIS

Acute rhinosinusitis is usually a self-limited illness resulting from a viral infection, allergy, or irritant that causes inflammation of the mucosal tissue in the nasal and paranasal sinus cavity. Clinical symptoms include nasal congestion and obstruction, purulent nasal discharge, maxillary tooth pain, facial pain or pressure, fever, fatigue, cough, hyposmia or anosmia, ear pressure or fullness, headache, and halitosis. Symptom duration ranges from 1 to 33 days, with most episodes resolving within a week (41). More than 4.3 million adults are diagnosed with sinusitis annually, and more than 80% of ambulatory care visits result in an antibiotic prescription, most commonly a macrolide (42). Most antibiotic prescriptions for this condition are unnecessary (43).

Determining the Likelihood of a Bacterial Infection

Acute rhinosinusitis is usually caused by a viral pathogen. Acute bacterial rhinosinusitis (ABRS) is considered to be a secondary infection resulting from obstruction of the sinus ostia that leads to impaired mu-

cosal clearance as a result of a viral upper respiratory tract infection (URI). Fewer than 2% of viral URIs are complicated by ABRS (14). The gold standard for diagnosis of bacterial sinusitis is sinus puncture with aspiration of purulent secretions, although it is rarely performed. Common bacteria isolated from sinus puncture are listed in the **Table**. Radiographic imaging has no role in ascertaining a bacterial cause (14, 44). Radiologic findings, such as mucous membrane thickening or sinus fluid or opacity, have a sensitivity of 90% in detecting a bacterial cause, the specificity is only 61% (44). Imaging is not helpful in guiding treatment because viral and bacterial causes have similar radiologic features, and it would increase costs by at least 4-fold (44).

Because ABRS lacks a simple and accurate diagnostic test, clinical guidelines recommend using clinical signs and symptoms to differentiate bacterial from viral causes (15). A bacterial cause is more likely when symptoms persist for more than 10 days without clinical improvement, symptoms are severe (fever $>39^{\circ}\text{C}$, purulent nasal discharge, or facial pain lasting for >3 consecutive days), or symptoms worsen after an initial period of improvement (double sickening) for more than 3 days. In addition, a patient with new-onset fever, headache, or increased nasal discharge after a typical viral URI that was initially improving is suspicious for a bacterial cause.

Appropriate Management Strategies

The 2012 IDSA clinical practice guidelines recommend empirical antibiotics as soon as a clinical diagnosis of ABRS is established on the basis of clinical criteria (15). Amoxicillin-clavulanate is the preferred agent, and doxycycline or a respiratory fluoroquinolone may be used as an alternative in patients with ABRS. The American Academy of Otolaryngology-Head and Neck Surgery emphasizes watchful waiting (without antibiotic therapy) as initial management for all patients with uncomplicated ABRS, regardless of severity (16). Some professional societies, including the American Academy of Allergy, Asthma & Immunology and the American Academy of Family Physicians, recommend amoxicillin as the preferred agent (17, 18). Although the IDSA recommendation is based on concern for antibiotic resistance, specifically ampicillin-resistant *Haemophilus influenzae* and *Moraxella catarrhalis*, no direct evidence suggests that amoxicillin-clavulanate is superior. Adjunctive therapy, such as intranasal saline irrigation or intranasal corticosteroids, has been shown to alleviate symptoms and potentially decrease antibiotic use (15). Patients who are seriously ill, who deteriorate clinically despite antibiotic therapy, or who have recurrent episodes should be referred to a specialist (for example, an otolaryngologist, infectious disease specialist, or allergist) (15).

Acute uncomplicated rhinosinusitis is a self-limited infection that usually resolves without antibiotics, even in patients with a bacterial cause. Most patients diagnosed with acute rhinosinusitis have more adverse effects than benefits from antibiotics (45). A meta-analysis