

FROM THE FAMILY PRACTICE INQUIRIES NETWORK

What findings distinguish acute bacterial sinusitis?

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■ EVIDENCE-BASED ANSWER

No combination of clinical findings can reliably distinguish acute viral rhinosinusitis from acute bacterial rhinosinusitis in primary care. Although unreliable, the best clinical predictor of acute bacterial sinusitis is the combination of unilateral nasal discharge and unilateral pain (positive likelihood ratio [LR+], 4.5; negative likelihood ratio [LR-], 0.25) (strength of recommendation [SOR]: **B**).¹ History of purulent rhinorrhea (LR+, 1.5–1.9), maxillary tooth pain (LR+, 2.1–2.5), and purulent secretions in the nasal cavity (LR+, 2.1–5.5) may increase the likelihood of acute bacterial rhinosinusitis. Illness that starts as the common cold and pain on bending forward were not predictors of acute bacterial rhinosinusitis (SOR: **B**).^{2,3,4}

■ EVIDENCE SUMMARY

In one series, 87% of patients with the common cold had an abnormal computed tomography (CT) scan of the sinuses 48 to 96 hours after onset. Abnormalities visible on the CT scan persisted in 20% of patients at 2 weeks, yet epidemiological studies have shown that acute bacterial rhinosinusitis develops in only 0.5% to 2% of upper respiratory infections in adults. In primary care, only half of patients with a clinical diagnosis of acute bacterial rhinosinusitis have it proven upon aspiration.⁵

Two studies compared clinical findings with sinus puncture, the reference standard for acute bacterial rhinosinusitis. Berg found 4 independent predictors of aspirate purulence in Swedish emergency room patients with “paranasal” symptoms lasting <3 months (**Table**).¹ Together, unilateral purulent nasal discharge and predominantly unilateral pain predicated purulence on aspiration (sensitivity 79%, specificity 83%, positive predictive value [PPV], 80%). Clinical exam by an otolaryngologist had a PPV of 72%.

While emergency and primary care patients may differ, this study's rate of aspiration-proven sinusitis (43%) is closer to that seen in primary care (50%) than in referral practices (70%–80%). This study's limitations included unclear referral criteria, overlapping clinical predictors, and lack of culture data.

In a study of general practice patients in the United Kingdom with clinically diagnosed acute maxillary sinusitis, no signs or symptoms were independently associated with their illness.⁶ The authors concluded that the clinical examination was more or less worthless. Only patients with positive findings on CT scan underwent aspiration in this study. Less differentiated, less severe symptoms and a less stringent definition of positive aspiration in this study may account for the different results. Additionally, one third of patients eligible for this study refused participation or withdrew prior to sinus puncture.⁶

Other primary care studies used less accurate reference tests such as CT² (sensitivity and specificity unknown),⁵ x-ray³ (sensitivity 41%–90%, specificity 61%–85%),⁵ and ultrasound⁴ (sensitivity 76%, specificity 76%).⁷

Williams found 5 independent predictors of x-ray findings consistent with sinusitis in 247 male veterans:

- maxillary toothache (LR+, 2.5)
- no improvement with decongestants (LR+, 2.1)
- purulent secretions on exam (LR+, 2.1)
- abnormal transillumination (LR+, 1.6)
- colored nasal discharge (LR+, 1.5).³

In at least 2 of these 4 studies, purulent secretions in the nasal cavity (LR+, 2.1–5.5),^{2,3} maxillary tooth pain (LR+, 2.1–2.5)^{3,4} and purulent rhinorrhea (LR+, 1.5–1.9)^{2,3,4} increased the likelihood of acute bacterial rhinosinusitis.

Finding purulent secretions in the nasal cavity is highly specific for acute bacterial rhinosinusitis (specificity 79%–100%)^{1,2,3} but is uncommon and difficult to assess, requiring the use of a nasal speculum and possibly topical decongestants. The primary care physician’s overall clinical impression was accurate in Williams’ study but not in others.^{2,4,6} Illness starting as the common cold and pain on bending forward were not predictors of acute bacterial rhinosinusitis.^{2,3,4} Headache, bilateral maxillary pain, frontal sinus pain, fever, sinus tenderness on exam, and purulent pharyngeal discharge have not been shown to be useful in acute bacterial rhinosinusitis diagnosis.⁷

Clinical prediction rule for acute bacterial rhinosinusitis

Symptoms	PPV
Local pain, unilateral predominance	41%
Purulent rhinorrhea, unilateral predominance	48%
Purulent rhinorrhea, bilateral	15%
Presence of pus in the nasal cavity	17%

Clinical prediction rule: 3/4 positive: positive likelihood ratio = 6.75, negative likelihood ratio = 0.21

PPV, positive predictive value

■ RECOMMENDATIONS FROM OTHERS

A recommendation from the Agency for Health Care Policy and Research suggests using symptomatic treatment initially when the prevalence of acute bacterial rhinosinusitis in patients with upper respiratory infection is <25%, and using clinical criteria (see **Table**) for acute bacterial rhinosinusitis diagnosis when prevalence is higher.⁵

The Centers for Disease Control and Prevention recommends reserving the diagnosis of acute bacterial rhinosinusitis for patients with symptoms lasting ≥ 7 days with maxillary pain or tenderness in the face or teeth (especially unilateral) and purulent nasal secretions.⁸

An otolaryngology guideline recommends considering acute bacterial rhinosinusitis when viral upper respiratory infection persists beyond 10 days or worsens after 5 to 7 days with similar symptoms.⁹ The 7-to-10-day specification is based on the natural history of rhinovirus infections (SOR: **C**).

A Canadian Medical Association evidence-based review recommended a score based on Williams' 5 independent predictor symptoms:

- fewer than 2 symptoms rule out acute bacterial rhinosinusitis (PPV, <40%)
- 4 or more symptoms rule in acute bacterial rhinosinusitis (PPV, 81%) (level of evidence [LOE]: **4**)
- 2 or 3 symptoms (PPV, 40%–63%) may benefit from radiography (SOR: **C**).¹⁰

CLINICAL COMMENTARY

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This summary emphasizes inconsistencies in the literature and the limited predictive value of clinical findings when diagnosing sinusitis. But there is a way to sidestep this problem. When a patient presents complaining of "sinusitis," I ask about their expectations for the visit and their understanding of their symptoms' possible causes, and then I often show the patient a picture of sinus anatomy. By demonstrating that the osteomeatal complex is small, and focusing on *obstruction* rather than *infection*, I am able to avoid any confrontation about antibiotics entirely. Then I can recommend irrigation, hydration, and analgesia. For patients whose symptoms persist beyond 10 to 14 days, and for whom these initial interventions have failed, a trial of antibiotics may be indicated.

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