

FROM THE FAMILY PRACTICE INQUIRIES NETWORK

What is the most effective diagnostic evaluation of streptococcal pharyngitis?

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■ EVIDENCE-BASED ANSWER

Standardized clinical decision rules, such as the Centor criteria, can identify patients with low likelihood of group A beta-hemolytic streptococcal (GABHS) pharyngitis who require no further evaluation or antibiotics (strength of recommendation [SOR]: **A**, based on validated cohort studies). For patients at intermediate and higher risk by clinical prediction rules, a positive rapid anti-gen detection (RAD) test is highly specific for GABHS (SOR: **A**, based on systematic reviews of diagnostic trials).

A negative RAD test result, using the best technique, approaches the sensitivity of throat culture (SOR: **B**, based on retrospective cohort studies). In children and populations with an increased prevalence of GABHS and GABHS complications, adding a backup throat culture reduces the risk of missing GABHS due to false-negative RAD results (SOR: **C**, based on expert opinion).

■ EVIDENCE SUMMARY

In the US, GABHS is the cause of acute pharyngitis in 5% to 10% of adults and 15% to 30% of children. It is the only commonly occurring cause of pharyngitis with an indication for antibiotic therapy.¹ The main benefit of antibiotic treatment in adults is earlier symptom relief—1 fewer day of fever and pain if antibiotics are begun within 3 days of onset.

Antibiotic treatment also reduces the incidence of acute rheumatic fever, which complicates 1 case per 100,000 in most of the US and Europe (relative risk reduction [RRR]=0.28).² The risk of acute rheumatic fever is higher in some populations (13–45 per 100,000).³ Treatment may also reduce suppurative

complications (peritonsillitis, particularly Native Americans and laryngeal or retropharyngeal abscess), which occur in 1 case out of 1000.^{2,4}

A systematic review of the diagnosis of GABHS evaluated the accuracy of history and physical exam elements.⁵ Clinical prediction rules based on selected symptoms and signs can identify patients at low risk for GABHS. The 4 Centor criteria (history of fever, anterior cervical adenopathy, tonsillar exudates, absence of cough) are well validated in adult populations (**Table 1**), while other clinical prediction rules (such as McIsaac) are validated in populations with children and adults (**Table 2**). The number of criteria present determines the likelihood ratio (LR), with which to calculate the posttest probability of GABHS.

The usefulness of clinical prediction rules depends on knowing how prevalent GABHS is among cases of pharyngitis in a particular community. In a typical US adult population, GABHS comprises 5% to 10% of cases. The presence of only 1 Centor criterion would reduce the probability of GABHS pharyngitis to 2% to 3%, while meeting all 4 criteria would raise the probability to 25% to 40%, an intermediate value (**Table 1**). If the prevalence of GABHS pharyngitis were 50%, as in some Native communities in Alaska, meeting all 4 criteria would predict an 86% probability of pharyngitis due to GABHS. Performing additional testing for patients with intermediate or high probability based on clinical prediction rules reduces the likelihood of unnecessary antibiotic treatment.¹

A systematic review⁶ of RAD testing demonstrates that the newer techniques (optical immunoassay, chemiluminescent DNA probes) have a sensitivity of 80% to 90%, which compares closely with that of throat culture (90%–95%). Both have a specificity greater than 95%, so false-positive test results are uncommon (LR+ =16–19). Treatment based on a positive RAD test would result in few unnecessary antibiotic prescriptions.¹

A retrospective outcome study⁴ reviewed the frequency of suppurative complications of GABHS among 30,036 patients with pharyngitis diagnosed with either RAD testing or throat culture. Patients included adults and children in a primary care setting. Complication rates were identical. A prospective study of 465 suburban outpatients with pharyngitis assessed the accuracy of RAD diagnosis using throat culture as a reference. The RAD accuracy was 93% for pediatric patients and 97% for adults.⁵ In another retrospective review of RAD testing, investigators performed 11,427 RAD tests over 3 years in a private pediatric group. There were 8385 negative tests, among which follow-up cultures detected 200 (2.4%) that were positive for GABHS. In the second half of the study, a newer RAD test produced a false-negative rate of 1.4%.⁷ Because of the possibility of higher false-negative RAD test rates in some settings, unless the physician has ascertained that RAD testing is comparable to throat culture in their own setting, expert opinion recommends confirming a negative RAD test in children or adolescents with a throat culture.¹ Patients at higher risk of GABHS or GABHS complications may also warrant throat culture back up of RAD testing.¹

Centor clinical prediction rules for diagnosis of GABHS (for adults)

One point for each: History of fever, anterior cervical adenopathy, tonsillar exudates, absence of cough
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Points	LR+	Pretest prevalence of GABHS (%)			
		5	10	25	50
		Post-test probability of GABHS (%)			
0	0.16	1	2	5	14
1	0.3	2	3	9	23
2	0.75	4	8	20	43
3	2.1	10	19	41	68
4	6.3	25	41	68	86

GABHS, group A beta-hemolytic streptococcus; LR+, positive likelihood ratio.

Adapted from data in Ebell et al 2000.⁵

McIsaac clinical prediction rules for diagnosis of GABHS (for adults and children)

One point for each: History of fever (or measured temperature >38°C), absence of cough, tender anterior cervical adenopathy, tonsillar swelling or exudates, age <15. Subtract 1 point if age 45 or more					
Points	LR+	Pretest prevalence of GABHS (%)			
		5	10	25	50
		Post-test probability of GABHS (%)			
-1 or 0	0.05	<1	1	2	5
1	0.52	3	5	15	33
2	0.95	5	10	24	47
3	2.5	12	22	45	56
4 or 5	4.9	20	35	62	71

GABHS, group A beta-hemolytic streptococcus; LR+, positive likelihood ratio.

Adapted from data in Ebell et al 2000.⁵

■ RECOMMENDATIONS FROM OTHERS

The Infectious Diseases Society of America recommends that if the physician is unable to exclude the diagnosis of GABHS on epidemiological or clinical grounds, either RAD testing or throat culture should be done. A positive result warrants treatment for patients with signs and symptoms of acute pharyngitis. A

negative RAD result for a child or adolescent should be confirmed by throat culture unless the physician has ascertained that the sensitivity of RAD testing and throat culture are comparable in his or her practice setting.¹

The American Academy of Pediatrics also recommends laboratory confirmation of GABHS pharyngitis in children with throat culture or RAD testing. If a patient suspected clinically of GABHS has a negative RAD test, a throat culture should be done. Since some experts believe RAD tests using optical immunoassay are sufficiently sensitive to be used without throat culture backup, physicians who wish to use them should validate them by comparison to throat culture in their practice.⁸

Clinical commentary

The RAD test helps to avoid overprescribing antibiotics

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The patient with a sore throat presents a diagnostic dilemma at 8:00 in the evening or on a Sunday morning. Patients (or parents) want something done, and frequently request antibiotics. Most of the time, they appreciate accurate information on the likelihood of a sore throat being a "strep throat" and the benefit or lack of benefit of antibiotics. The "in-between" cases are the toughest to manage, and the RAD test gives us the additional information needed to avoid overprescribing antibiotics. Empathetic reassurance and symptomatic treatment still suffice in most cases.

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