Evaluation of acute pharyngitis in adults

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Literature review current through: May 2017. | This topic last updated: Jan 04, 2016.

INTRODUCTION — Acute pharyngitis is one of the most common conditions encountered in office practice, accounting for 12 million ambulatory visits in the United States annually [[1](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/1)]. While group A streptococcus is an important treatable infection, it accounts for a minority (approximately 5 to 15 percent) of adults presenting with pharyngitis [[2](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/2)]. Despite this, a majority of patients with pharyngitis receive presumptive antibiotic therapy. One report estimates that 60 percent (95% CI 57-63 percent) of adults seen in a United States clinic in 2010 for a complaint of sore throat received an antibiotic prescription, with a trend toward prescribing broader spectrum antibiotics (azithromycin) rather than narrow spectrum antibiotics (eg, penicillin) [[3](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/3)]. Overtreatment of acute pharyngitis is a major cause of inappropriate antibiotic use, which can be avoided by a systematic approach to evaluation and treatment [[4](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/4)].

The etiology, general approach to, and evaluation of acute pharyngitis in adults will be reviewed here. The treatment and complications of group A streptococcal pharyngitis and symptomatic management of pharyngitis are discussed separately. (See "Treatment and prevention of streptococcal tonsillopharyngitis" and "Symptomatic treatment of acute pharyngitis in adults".)

ETIOLOGY

Infectious causes — Multiple pathogens can cause pharyngitis (table 1) [[5](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/5)]. Although viruses are believed to cause most cases of pharyngitis, the relative frequency of particular pathogens in adults is uncertain, since most studies are old and include both children and adults [[6-8](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/6-8)]. Identification of a particular microorganism, by culture or rapid antigen detection, does not prove causation of the pharyngitis since many organisms colonize the upper respiratory tract without causing disease.

Group A streptococcus (GAS) — The most important treatable agent is group A streptococcus (GAS). Approximately 5 to 15 percent of sore throats in adults yield positive cultures for GAS [[2](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/2)].

Clinical features of GAS include the sudden onset of sore throat, tonsillar exudate, tender cervical adenitis, and fever. Cough and significant rhinorrhea are usually absent. The Centor criteria (exudate, cervical adenopathy, fever history, and lack of cough) provide a clinical prediction rule with reasonable negative predictive value in excluding streptococcal pharyngitis [[9,10](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/9,10)]. (See 'Centor criteria' below.)

Suppurative and nonsuppurative complications, although uncommon, can follow GAS pharyngitis. Suppurative complications refer to sinusitis and retropharyngeal and peritonsillar abscesses. The nonsuppurative complications are acute rheumatic fever and acute glomerulonephritis. Scarlet fever, another nonsuppurative complication, is much less common in adults than in children. (See "Complications of streptococcal tonsillopharyngitis".)

Viruses — The most common causes of pharyngitis are viral agents (table 1). Viruses associated with pharyngitis in adults include influenza, parainfluenza, coronavirus, rhinovirus, adenovirus, enterovirus, respiratory syncytial virus, metapneumovirus, herpes simplex virus (HSV), Epstein-Barr virus (EBV), cytomegalovirus (CMV), and the human immunodeficiency virus (HIV). Co-infections with streptococci and viruses may occur [[7,11](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/7,11)].

●**Influenza** — Influenza is treatable, readily transmitted, and, at the outset of a season, epidemiologically important to recognize. Influenza is suspected by several features: the presence of influenza cases in the community (epidemic), association with cough, and myalgias. Hyperemia is often present. However, tonsillar exudates are uncommon, even with complaints of severe sore throat. (See "Clinical manifestations of seasonal influenza in adults".)

●**Epstein Barr Virus (EBV)**— Infectious mononucleosis is the best known acute clinical manifestation of EBV. Infectious mononucleosis often begins with malaise, headache, and low-grade fever before development of the more specific signs of tonsillitis and/orpharyngitis, cervical lymph node enlargement and tenderness, and moderate to high fever [[12](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/12)]. Fatigue is a prominent component when pharyngitis is due to infectious mononucleosis. Because the presenting symptoms are nonspecific, the diagnosis may not become apparent until the pharyngitis has persisted beyond expectations for other etiologies. Most patients with infectious mononucleosis caused by EBV have prominent pharyngeal symptoms with or without tonsillar exudate. Diffuse adenitis, splenomegaly, and skin rash are suggestive of EBV infection. (See "Clinical manifestations and treatment of Epstein-Barr virus infection" and "Infectious mononucleosis in adults and adolescents".)

●**Cytomegalovirus (CMV)**–CMV may also cause a mononucleosis-like illness. CMV is less likely than EBV to be associated with pharyngitis. The illness is characterized primarily by prolonged fever, less prominent lymphadenopathy, and absent or mild pharyngitis. (See "Infectious mononucleosis in adults and adolescents", section on 'Cytomegalovirus' and "Epidemiology, clinical manifestations, and treatment of cytomegalovirus infection in immunocompetent adults", section on 'CMV mononucleosis'.)

●**Primary HIV** — The possibility of acute HIV infection should be considered in patients who present with consistent signs and symptoms, including an ill-defined febrile illness, heterophile-negative mononucleosis-like syndrome, and/or aseptic meningitis. Sore throat is a frequent manifestation of acute HIV infection, and painful mucocutaneous ulceration is one of the most distinctive manifestations of acute HIV infection. Shallow, sharply demarcated ulcers with white bases surrounded by a thin area of erythema may be found on the oral mucosa [[13](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/13)]. The physical examination also reveals pharyngeal edema and hyperemia, usually without tonsillar enlargement or exudate [[14,15](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/14,15)]. Other common clinical features of acute HIV infection include fever, fatigue, myalgias, adenopathy, and rash. (See "Acute and early HIV infection: Clinical manifestations and diagnosis", section on 'Oropharyngeal findings'.)  
  
It is important to establish the diagnosis of primary HIV infection, both for treatment of the individual patient and to help prevent rapid HIV transmission in the two months following initial infection.

●**Herpes simplex viruses** — HSV type 1 has been reported to cause up to 10 percent of cases of acute pharyngitis and/or tonsillitis in college students [[16](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/16)]. Primary oral HSV-1 infection in adults can present as severe pharyngitis. In one study of college students, the major presenting signs of those with clinical pharyngitis due to HSV-1 were pharyngeal edema (71 percent), tonsillar exudate (40 percent), and oral exudative and ulcerative lesions (34 percent) [[16](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/16)]. Because only a minority of these patients has lesions of the anterior mouth or lips, they cannot be easily distinguished from other causes of acute pharyngitis. Rare cases of pharyngeal HSV type 2 infections may occur secondary to orogenital contact [[17](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/17)]. (See "Clinical manifestations and diagnosis of herpes simplex virus type 1 infection", section on 'Adults'.)

Other bacteria — Various bacterial agents other than GAS can cause acute pharyngitis (table 1).

●**Non-group A streptococcus** — Groups C and G streptococci can cause pharyngitis that is clinically indistinguishable from GAS pharyngitis. However, acute pharyngitis caused by group C or group G beta hemolytic streptococci is not associated with acute rheumatic fever [[18](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/18)]. Group C streptococcus is considered a common cause of pharyngitis in adults and college students [[19,20](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/19,20)]. Group G streptococcus has been linked to community outbreaks of pharyngitis in older children [[21](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/21)]. The treatment of Group C or Group G pharyngitis is discussed separately. (See "Treatment and prevention of streptococcal tonsillopharyngitis" and "Group C and group G streptococcal infection".)

●**Arcanobacterium haemolyticum** — Arcanobacterium haemolyticum (formerly Corynebacterium haemolyticum) is a gram-positive bacillus that is an uncommon cause of acute pharyngitis and tonsillitis. Symptomatic infection with this organism may closely mimic acute streptococcal pharyngitis. Two features of pharyngeal infection with this organism are notable. It has a predilection for adolescents and young adults, and it frequently provokes a generalized rash that may resemble that of scarlet fever [[22](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/22)]. The organism might not be identified in routine throat cultures. Thus the clinician should suspect A. haemolyticum infection in adolescents or young adults who have an acute pharyngitis and scarlatiniform rash but a negative culture or rapid streptococcal antigen test for GAS [[5](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/5)]. (See "Treatment and prevention of streptococcal tonsillopharyngitis", section on 'Antibiotics for other organisms' and "Group A streptococcal tonsillopharyngitis in children and adolescents: Clinical features and diagnosis", section on 'Other bacterial infections'.)

●**Corynebacterium diphtheriae** — C. diphtheriae, the etiologic agent of diphtheria, produces pharyngitis, malaise, and low-grade fever. The onset of symptoms is typically gradual. The infection can begin with mild pharyngeal injection and erythema. The hallmark of diphtheria, the formation of a tightly adhering gray membrane that causes bleeding when dislodged, occurs in at least one-third of patients. Diphtheria should be considered in patients with compatible symptoms who have recently traveled to countries where the disease remains endemic. (See "Epidemiology and pathophysiology of diphtheria" and "Clinical manifestations, diagnosis, and treatment of diphtheria".)

●**Neisseria gonorrhoeae** — N. gonorrhoeae is a relatively rare cause of pharyngitis, but represents a treatable and transmissible pathogen that has important public health implications. Most cases are asymptomatic [[23](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/23)]. (See "Clinical manifestations and diagnosis of Neisseria gonorrhoeae infection in adults and adolescents" and "Treatment of uncomplicated gonococcal infections", section on 'Pharyngeal infection'.)

●**Chlamydia pneumoniae** — C. pneumoniae generally affects young, previously healthy adults. When C. pneumoniae causes pharyngitis, it is usually accompanied by other manifestations such as acute bronchitis or pneumonitis. Clinical laboratory methods for identification of C. pneumoniae are suboptimal and it is rare to make a definitive diagnosis in a timely manner. (See "Pneumonia caused by Chlamydia pneumoniae in adults" and "Acute bronchitis in adults".)

●**Tularemia**— Tularemia is the zoonotic infection caused by Francisella tularensis, an aerobic and fastidious gram-negative bacterium. The major symptoms are fever and severe sore throat. Pharyngeal tularemia accounts for a small percentage of cases in the United States, but has comprised a larger percentage of cases worldwide, particularly in outbreaks that have occurred as a consequence of the disruptions caused by war or natural disaster [[24,25](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/24,25)]. (See "Clinical manifestations, diagnosis, and treatment of tularemia", section on 'Clinical manifestations'.)

●**Fusobacterium necrophorum** — Fusobacterium necrophorum (Fn) is the causative agent of most cases of Lemierre syndrome (septic thrombophlebitis of the internal jugular vein). However, since 2005, several reports have documented the isolation of Fusobacterium necrophorum (Fn) from throat swabs of adolescents and young adults with nonstreptococcal sore throat [[26-28](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/26-28)]. (See "Suppurative (septic) thrombophlebitis", section on 'Jugular vein'.)  
  
There is some evidence for Fn as a primary pathogen in acute pharyngitis in adolescents and young adults without Lemierre syndrome [[29](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/29)]. One observational study at a single United States university health clinic in students aged 15 to 30 years found that Fn was detected in 20.5 percent of students with acute sore throat, compared with 9.4 percent of asymptomatic students [[20](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/20)]. However, there is no evidence that Fn pharyngitis leads to Lemierre syndrome or that treatment prevents it [[30](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/30)]. Further study is required to determine the role of Fn in acute pharyngitis, as well as the necessity for and efficacy of therapy. Treatment for Fn pharyngitis is discussed separately. (See "Treatment and prevention of streptococcal tonsillopharyngitis", section on 'Antibiotics for other organisms'.)

Mycoplasma pneumoniae — Mycoplasma respiratory infections are characterized by pharyngitis, constitutional symptoms, and persistent cough [[31](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/31)]. Pharyngitis as a manifestation of mycoplasma infection occurs primarily in young, previously healthy adults. (See "Mycoplasma pneumoniae infection in adults" and "Acute bronchitis in adults".)

Non-infectious causes — The most common non-infectious causes of inflammation of the pharynx are allergies. Patients with seasonal or environmental allergies can complain of sore throat. Smokers and those exposed to second-hand smoke may also have intermittent episodes of non-infectious pharyngitis. Poorly humidified air in the home or workplace, particularly in the winter, can be associated with pharyngitis as well.

CLINICAL FEATURES — Adults with pharyngitis typically complain of sore throat, particularly when swallowing. Fever is often present with bacterial pharyngitis and may occur in association with headache or malaise. Patients may note “swollen glands” or anterior neck pain related to lymphadenopathy.

Many patients with viral pharyngitis also have signs and symptoms associated with a viral upper respiratory infection (nasal congestion, coryza, hoarseness, sinus discomfort or tenderness, ear pain, or cough).

Findings on physical examination in patients with pharyngitis will rarely distinguish the etiology. With rare exception, none of the agents of acute pharyngitis presents a unique clinical picture, complicating the ability of clinicians to distinguish among the pathogens. Some abnormal findings restricted to the throat (eg, hyperemia) and related lymph nodes are consistent with streptococcal pharyngitis, but may also be found in patients with other etiologies for pharyngitis, including viral infection. The Centor criteria are helpful in identifying patients unlikely to have GAS. (See 'Etiology' above and 'Centor criteria' below.)

EVALUATION — The major goal of the evaluation of adults with sore throat or acute pharyngitis is to exclude potentially dangerous causes, to identify any treatable causes, and to improve symptoms. Identifying group A streptococcus (GAS) is important because timely treatment with antibiotics helps prevent poststreptococcal complications such as acute rheumatic fever [[32](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/32)]. The evaluation includes a thorough history, focused physical examination, and diagnostic testing in selected patients.

Physical examination of patients with GAS pharyngitis will reveal pharyngeal erythema, often associated with tonsillar hypertrophy, and purulent exudate. Anterior cervical lymph nodes are typically tender and enlarged. Palatal petechiae may be present.

Patients calling in to the physician’s office who can reliably report that they have no fever and who have a cough in addition to their sore throat symptoms would not meet criteria for diagnostic testing. Such patients can be advised to stay home and monitor themselves for warning signs. They should be cautioned to present for evaluation if fever develops, if they have difficulty swallowing or if they develop any unusually severe signs and symptoms (secretions, drooling, dysphonia, muffled "hot potato" voice, or neck swelling). (See 'Diagnostic tests' below and 'Excluding dangerous conditions' below.)

Students older than 18 who reside in a college dormitory are likely to be at higher risk for streptococcal pharyngitis and should be approached like those 18 and younger. (See "Group A streptococcal tonsillopharyngitis in children and adolescents: Clinical features and diagnosis", section on 'Diagnosis'.)

In the vast majority of patients with a negative evaluation for GAS, the pharyngitis will resolve without sequelae and no further diagnostic measures are required [[2](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/2)]. Symptomatic treatment should be offered. (See "Symptomatic treatment of acute pharyngitis in adults".)

Excluding dangerous conditions — Patients who present with unusually severe signs and symptoms (secretions, drooling, dysphonia, muffled "hot potato" voice, or neck swelling), particularly if they have difficulty swallowing, should be evaluated for rare but serious throat infections. Evaluation for primary HIV infection should be considered in patients with painful mucocutaneous ulcers or risk factors for HIV.

●**Epiglottis —**Epiglottitis is inflammation of the epiglottis and adjacent supraglottic structures. The clinical features of epiglottitis differ with age, severity, and etiology. Presenting features of epiglottitis in adults include sore throat or odynophagia, fever, muffled voice, drooling, stridor or respiratory distress, and hoarseness. Epiglottitis should be suspected in adults in whom the severity of sore throat is out of proportion to the findings on oropharyngeal examination [[33](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/33)]. (See "Epiglottitis (supraglottitis): Clinical features and diagnosis", section on 'Adults'.)

●**Peritonsillar abscess** **—** The typical clinical presentation of peritonsillar abscess is a severe sore throat (usually unilateral), fever, and a "hot potato" or muffled voice. Pooling of saliva or drooling may be present. Trismus, related to irritation and reflex spasm of the internal pterygoid muscle, occurs in nearly two-thirds of patients; it helps to distinguish peritonsillar abscess from severe pharyngitis or tonsillitis [[34,35](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/34,35)]. Patients often have neck swelling and pain and may have ipsilateral ear pain [[36](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/36)]. Fatigue, irritability, and decreased oral intake may occur as a result of discomfort. (See "Peritonsillar cellulitis and abscess", section on 'Evaluation'.)

●**Submandibular space infections** **—** Patients with submandibular space infections (Ludwig’s angina) typically present with fever, chills, and malaise, as well as mouth pain, stiff neck, drooling, and dysphagia, and may lean forward to maximize the airway diameter [[37](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/37)]. They may have a muffled voice or be unable to speak at all. Trismus is usually absent. On physical examination, patients have tender, symmetric, “woody” induration, sometimes with palpable crepitus, in the submandibular area. There is usually no lymphadenopathy. The floor of the oropharynx is usually elevated, erythematous, and tender to palpation. (See "Submandibular space infections (Ludwig's angina)", section on 'Clinical features'.)

●**Retropharyngeal space infections** **—** Infection may reach the retropharyngeal space from either local or distant sites. Penetrating trauma (eg, from chicken bones or following instrumentation) is the usual source of local spread; in such cases, a sore throat or difficulty in swallowing or breathing may be the first indication of infection.

●**Primary HIV** — Sore throat is a frequent manifestation of acute HIV infection. Painful mucocutaneous ulceration is one of the most distinctive manifestations of acute HIV infection. Other common clinical features of acute HIV infection include fever, fatigue, myalgias, adenopathy, and rash. The diagnosis of HIV is discussed in detail separately. (See "Acute and early HIV infection: Clinical manifestations and diagnosis", section on 'Oropharyngeal findings'.)  
  
Parapharyngeal space infections, peritonsillar abscess ("quinsy"), submandibular space infection (Ludwig's angina), and epiglottitis are discussed separately. (See "Peritonsillar cellulitis and abscess" and "Deep neck space infections" and "Epiglottitis (supraglottitis): Clinical features and diagnosis", section on 'Adults'.)

Identifying patients with GAS

Centor criteria — The Centor criteria are a widely used and accepted clinical decision tool [[38-40](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/38-40)]. These criteria are:

●Tonsillar exudates

●Tender anterior cervical adenopathy

●Fever by history

●Absence of cough

The likelihood of having GAS increases with the number of Centor criteria. However, the Centor criteria are most useful in identifying patients for whom neither microbiologic tests nor antimicrobial therapy are necessary. Patients with fewer than three (0 to 2) Centor criteria are unlikely to have GAS and, in general, should not receive either antibiotic treatment or diagnostic testing.

Several studies have evaluated the ability of these criteria to predict the presence of GAS infection [[10,41,42](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/10,41,42)]. In a large study of 206,870 patients, 7 percent of patients with one Centor criteria, 21 percent of patients with two Centor criteria, 38 percent of patients with three Centor criteria, and 57 percent of patients with four Centor criteria tested positive for GAS (using RADT and throat culture for negative RADT results) [[42](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/42)].

The modified Centor criteria (also known as the McIsaac score) adds age to the original Centor criteria (one additional point for age 3 to 14 years, no additional points for age 15 to 44 years, and minus one point for age ≥45 years) [[43](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/43)]. The modified Centor criteria is used more often in pediatric populations.

Diagnostic tests — Most authorities, and several published practice guidelines, favor evaluation of adult patients with three or more Centor criteria using a sensitive rapid antigen detection test (RADT), without reflex throat culture for negative RADT results [[18,38,39](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/18,38,39)]. This is the approach that we take. (See 'Rapid antigen detection test' below.)   
  
Specific patient populations may benefit from backup throat culture if RADT is negative. (See 'Throat culture' below.)

Rapid antigen detection test — In adults with three or more Centor criteria, we use a sensitive RADT without backup throat culture for negative results [[44](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/44)]. A positive RADT is highly specific and is useful in establishing the diagnosis of GAS pharyngitis, allowing for rapid initiation of antibiotic therapy.

Our approach of using a sensitive RADT without backup throat culture for negative results in patients with three or more Centor criteria means that some adults with pharyngeal GAS will not be treated. However, the RADT has a high negative predictive value, acute GAS pharyngitis in otherwise healthy adults is largely a benign and self-limited illness, and the risk of acute rheumatic fever in developed countries is exceptionally low [[39](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/39)]. The use of throat culture in patients with negative RADT is discussed below. (See 'Throat culture' below.)

Rapid antigen detection tests for streptococcus, sometimes referred to as rapid streptococcal antigen tests, are based upon enzyme or acid extraction of antigen from throat swabs [[45-49](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/45-49)]. Sensitivity for the streptococcal RADT ranges from 70 to 90 percent and specificity from 90 to 100 percent in multiple studies [[32,44,50-52](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/32,44,50-52)]. The performance of the RADT can vary depending on the clinical characteristics of patients being tested, such as the number of Centor criteria present, a heavy versus light inoculum, as well as the clinical experience of the physician performing the test [[52-55](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/52-55)]. (See 'Specimen collection and transport' below.)

The approach to use of RADT testing in children is reviewed separately. (See "Evaluation of sore throat in children".)

Throat culture — Throat culture has been considered the gold standard method to establish the microbial cause of acute pharyngitis. However, compared with RADT, cultures delay diagnosis as they take 24 to 48 hours to grow. Throat culture is primarily used as a backup test in patients with negative RADT where clinical concern for GAS or bacterial pharyngitis is still high.

For adults at higher risk for severe infections (eg, poorly-controlled diabetes mellitus, immunocompromised, on chronic corticosteroids), throat culture can be obtained at the initial visit even if the rapid antigen detection test is negative for GAS. Throat culture is also reasonable in cases where prevention of transmission of GAS is particularly important (eg, adults in contact with people who are particularly vulnerable to complications of infection, such as immunocompromised individuals, infants, or the elderly), or in the presence of endemic or epidemic rheumatic fever. The use of backup culture can also be considered a reasonable approach in patients with Centor score ≥3 with negative RADT but in whom clinical suspicion for GAS remains high.

With proper collection and processing techniques, the sensitivity of throat culture is between 90 to 95 percent and specificity is between 95 to 99 percent [[39](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/39)]. The figure given for sensitivity is based on double swabs, which show discordant results in 9 to 12 percent of cases [[56](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/56)]. The performance in practice, however, is often significantly lower than these figures, because the sensitivity can be negatively affected by suboptimal methods of specimen collection and laboratory processing. (See 'Specimen collection and transport' below.)

DNA probes — We do not use DNA probes routinely. However, due to their high sensitivity and specificity (94.8 and 100.0 percent, respectively), DNA probes are used by some laboratories as an alternative to throat culture to confirm findings when RADT is negative [[57](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/57)]. It may be helpful in specific patients with negative RADT. (See 'Throat culture' above.)

In one observational study, DNA strep probes were performed in 15,555 symptomatic adults with a negative RADT; 6 percent of patients had positive DNA probe [[51](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/51)]. Because half the patients with a negative RADT and positive DNA probe were treated with antibiotics, the DNA probe changed management for only 3 percent of patients, at a cost of over 1.75 million dollars.

DNA probe can also be used as a stand-alone test. Turn-around time is 24 hours as compared with up to 72 hours for throat culture, which allows for quicker diagnosis, but does not support a same visit treatment decision.

Specimen collection and transport — The key to optimizing detection of GAS in clinical specimens is appropriate collection and transport of the sample [[58](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/58)]:

●Specimens should be obtained prior to the initiation of antimicrobial therapy. Even a single dose of antibiotics may be sufficient to render the culture or RADT negative [[59,60](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/59,60)].

●Specimens should be obtained by vigorous swabbing of both tonsils (or tonsillar fossae in patients without tonsils) and the posterior pharynx. The tongue, buccal mucosa, and hard palate are **not** satisfactory sites for culture and should be avoided. The importance of obtaining an adequate specimen cannot be overstated, as the sensitivity of both culture and rapid antigen detection testing correlate with inoculum size [[61](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/61)].

●Although double testing for both RADT and culture is not recommended for most adults, if such a strategy is chosen, two separate samples should be used; the sample obtained for the RADT should not be then sent for routine culture.

●GAS are relatively resistant to desiccation. The organism remains viable on dry swabs for 48 to 72 hours.

Patients who do not have GAS — In the vast majority of patients with a negative evaluation for GAS, the pharyngitis will resolve in a few days without sequelae and no further diagnostic measures are required [[2](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/2)]. Symptomatic treatment should be offered. (See "Symptomatic treatment of acute pharyngitis in adults".)

Patients needing further evaluation — Adults who test negative for GAS and do not improve with symptomatic treatment within five to seven days or who have worsening symptoms, should be reassessed for a previously unsuspected diagnosis (eg, infectious mononucleosis or primary HIV infection) or a suppurative complication (eg, peritonsillar abscess).

Some experts suggest that physicians should consider Fusobacterium necrophorum infection in adolescents and young adults (ages 15 to 30) with a negative rapid test for streptococcus whose episode of pharyngitis is unusually prolonged and severe [[62,63](https://www.uptodate.com/contents/evaluation-of-acute-pharyngitis-in-adults/abstract/62,63)].

SOCIETY GUIDELINE LINKS — Links to society and government-sponsored guidelines from selected countries and regions around the world are provided separately. (See "Society guideline links: Streptococcal tonsillopharyngitis".)

INFORMATION FOR PATIENTS — UpToDate offers two types of patient education materials, “The Basics” and “Beyond the Basics.” The Basics patient education pieces are written in plain language, at the 5th to 6th grade reading level, and they answer the four or five key questions a patient might have about a given condition. These articles are best for patients who want a general overview and who prefer short, easy-to-read materials. Beyond the Basics patient education pieces are longer, more sophisticated, and more detailed. These articles are written at the 10th to 12th grade reading level and are best for patients who want in-depth information and are comfortable with some medical jargon.

Here are the patient education articles that are relevant to this topic. We encourage you to print or e-mail these topics to your patients. (You can also locate patient education articles on a variety of subjects by searching on “patient info” and the keyword(s) of interest.)

●Basics topics (see "Patient education: Sore throat in adults (The Basics)")

●Beyond the Basics topics (see "Patient education: Sore throat in adults (Beyond the Basics)")

SUMMARY AND RECOMMENDATIONS

●Group A streptococcus (GAS), the major treatable pathogen for acute pharyngitis, is the cause of pharyngitis in only approximately 5 to 15 percent of adults who seek medical care. However, antibiotics are prescribed for more than 70 percent of adults who present with pharyngitis. (See 'Introduction' above.)

●Many pathogens cause pharyngitis, but with rare exception, few present a unique clinical picture. Clinical features of GAS include sudden onset of sore throat, tonsillar exudate, tender cervical adenopathy, and fever. Influenza is suspected when present in the community, and sore throat is accompanied by myalgias, cough, and high fever. (See 'Etiology' above and 'Group A streptococcus (GAS)' above.)

●Patients who present with unusually severe signs and symptoms (secretions, drooling, dysphonia, muffled "hot potato" voice, or neck swelling), particularly if they have difficulty swallowing, should be evaluated for rare but serious throat infections. (See 'Excluding dangerous conditions' above.)

●The number of Centor clinical criteria present (tonsillar exudates, tender anterior cervical adenopathy, fever history, absence of cough) correlates with the likelihood of acute GAS pharyngitis in an adult patient. (See 'Centor criteria' above.)

•Most patients with two or fewer Centor criteria (tonsillar exudates, tender anterior cervical adenopathy, fever history, absence of cough) should not receive either antibiotic treatment or diagnostic testing. Exceptions might include patients with a history of rheumatic fever, or those at highest risk for severe infections. (See 'Evaluation' above.)

•For adults with three or more Centor criteria, we suggest obtaining a sensitive RADT without reflex throat culture for negative results. However, the use of backup culture can also be considered a reasonable approach in patients with Centor score ≥3 with negative RADT but in whom clinical suspicion for GAS remains high. (See 'Diagnostic tests' above.)

●For adults at higher risk for severe infections (eg, poorly-controlled diabetes mellitus, immunocompromised, on chronic corticosteroids), throat culture can be obtained at the initial visit even if the rapid antigen detection test is negative for GAS. (See 'Throat culture' above.)

●Patients in whom pharyngitis secondary to GAS has been determined are treated with antibiotics. (See "Treatment and prevention of streptococcal tonsillopharyngitis".)

●Adults who do not have GAS should be offered symptomatic treatment. (See "Symptomatic treatment of acute pharyngitis in adults".)

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***Contributor Disclosures:*** **Anthony W Chow, MD, FRCPC, FACP**Nothing to disclose. **Shira Doron, MD**Speaker's Bureau: Merck; Allergan [Cdiff, skin and soft tissue infection, UTI (Ertapenem, imipenem, moxifloxacin, daptomycin, ceftaroline, dalbavancin)]. Consultant/Advisory Boards: Allergan [skin and soft tissue infection (dalbavancin)]; Becton Dickinson (prevention of hospital acquired infection, skin cleaning). **Mark D Aronson, MD**Nothing to disclose. **Sheila Bond, MD**Employment: EBSCO [General medicine (Web-based clinical information resource)].