

UPPER RESPIRATORY TRACT INFECTIONS

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NONSPECIFIC INFECTIONS OF THE UPPER RESPIRATORY TRACT

nonspecific URIs have no prominent localizing features.

- acute infective rhinitis
- acute rhinopharyngitis / nasopharyngitis
- acute coryza, and
- acute nasal catarrh
- as well as by the inclusive label common cold.

Nearly all nonspecified URIs are caused by viruses

- rhinovirus the most common cause of URI (~30-40% of cases)
- other causes include influenza virus as well as parainfluenza virus, coronavirus and adenovirus
- Respiratory syncytial virus (RSV), a well-established pathogen in pediatric populations, is also a recognized cause of significant disease in elderly and immunocompromised individuals.

VIRUS GROUP	ANTIGENIC TYPES
Rhinoviruses	>156 types
Coronaviruses	5 types
Parainfluenza virus	5 types
Respiratory syncytial virus	2 types
Influenza virus	3 types <u>^a</u> (<u>tn0010</u>).
Adenovirus	57 types
Metapneumovirus	2 types
Other viruses: enteroviruses, bocavirus	

Clinical Manifestations

- The incubation period for rhinovirus is typically 2 to 4 days.
 - Common cold symptoms often begin with a sore or scratchy throat. Rhinorrhea and sneezing typically follow and persist for several days, after which nasal congestion and cough become the dominant symptoms Mucus color often changes from clear to yellow or green during the course of a cold.
 - The mean duration of symptoms is 7 to 10 days, but nasal congestion and cough can persist for weeks.
 - Other symptoms that may be experienced include headache, hoarseness, chilliness, and malaise.
- Fever is uncommon in adults but common in children.

Between 0.5 and 2% of colds are complicated by *secondary bacterial infections (rhinosinusitis, otitis media, and pneumonia)*, particularly in higher-risk populations such as infants, elderly persons, and chronically ill or immunosuppressed individuals.

Secondary bacterial infections usually are associated with a prolonged course of illness, increased severity of illness, and localization of signs and symptoms, often as a rebound after initial clinical improvement

Symptomatic Therapy

- Fever, myalgias, and sore throat can be treated with acetaminophen or a nonsteroidal anti-inflammatory drug (NSAID) such as ibuprofen.
- Rhinorrhea can be treated with ipratropium bromide.
- Nasal congestion can be managed with nasal decongestants such as oxymetazoline (two sprays into each nostril twice a day for up to 5 days) or systemic decongestants such as pseudoephedrine. Products that combine a decongestant with analgesics, antihistamines, or both help relieve symptoms.

- Although supporting data are weak, cough may be relieved with dextromethorphan or benzonatate. Opioids, while effective at relieving cough, are associated with somnolence, dysphoria, constipation, and addiction.
- nasal congestion; Both oral and topical adrenergic agents;
Pseudoephedrine
- Cough ; Dextromethorphan
- There is insufficient evidence regarding the utility of expectorants such as guaifenesin

Honey can help soothe a sore throat for children >1 year old.
Cool-mist humidifiers may help with breathing, and saline nasal drops and bulb suctioning can help with nasal congestion.

Other remedies that are ineffective, of questionable benefit, or associated with significant adverse effects include Echinacea, zinc, inhaled steam, vitamin C, vitamin D, garlic, antihistamines, Chinese medicinal herbs, intranasal glucocorticoids, Pelargonium sidoides herbal extract, saline nasal irrigation, and antiviral drugs.

There is no evidence to support the use of vitamin C or other vitamins in otherwise healthy individuals for the treatment or prevention of the common cold.

Echinacea has similarly been shown to be of no benefit.

The efficacy of zinc, administered as zinc gluconate or zinc acetate lozenges, is controversial.

Systematic reviews and meta-analyses have generally concluded that zinc lozenges may shorten the duration of the common cold by about 2 days.

INFECTIONS OF THE PHARYNX

Etiology

respiratory viruses are the most common cause of acute pharyngitis

- rhinoviruses
 - coronaviruses
 - Influenza virus,
 - parainfluenza virus, and
 - adenovirus
(pharyngoconjunctival fever).
- herpes simplex virus (HSV) types 1 and 2,
 - coxsackievirus A,
 - cytomegalovirus (CMV),
 - Epstein-Barr virus (EBV).
 - Acute HIV infection

Viruses

Rhinovirus	Common cold
Coronavirus	Common cold
Adenovirus	Pharyngoconjunctival fever
Herpes simplex types 1 and 2	Pharyngitis , gingivostomatitis
Parainfluenza	Cold, croup
Enteroviruses	Herpangina, hand-foot-mouth disease
Epstein-Barr virus	Infectious mononucleosis
Cytomegalovirus	CMV mononucleosis
Human immunodeficiency virus	Primary HIV infection
Influenza A and B	Influenza
Respiratory syncytial virus	Cold, bronchiolitis, pneumonia
Human metapneumovirus	Cold, bronchiolitis, pneumonia



Acute bacterial pharyngitis

- Group A streptococcal ;children aged 5-15 years
- Streptococci of groups C and G
- *Fusobacterium necrophorum* (Lemierre disease,)
- *Neisseria gonorrhoeae*,
- *Corynebacterium diphtheriae*,
- *Corynebacterium ulcerans*,
- *Yersinia enterocolitica*, and
- *Treponema pallidum* (in secondary syphilis).
- Anaerobic bacteria
- *M. pneumoniae* and *C. pneumoniae*

PATHOGEN	ASSOCIATED DISORDER(S)
Bacteria	
<i>Streptococcus</i> , group A	Pharyngitis , tonsillitis, scarlet fever
<i>Streptococcus</i> , group C and G	Pharyngitis , tonsillitis
Mixed anaerobes	Vincent angina
<i>Fusobacterium necrophorum</i>	Pharyngitis , tonsillitis, Lemierre syndrome
<i>Neisseria gonorrhoeae</i>	Pharyngitis , tonsillitis
<i>Corynebacterium diphtheriae</i>	Diphtheria
<i>Arcanobacterium haemolyticum</i>	Pharyngitis , scarlatiniform rash
<i>Yersinia pestis</i>	Plague
<i>Francisella tularensis</i>	Tularemia, oropharyngeal form
<i>Treponema pallidum</i>	Secondary syphilis



Epstein-Barr Virus

- Infectious mononucleosis (IM) is a multisystem disorder caused by primary infection with Epstein-Barr virus (EBV), the classic symptoms of fever, fatigue, pharyngitis, and adenopathy.
- Fatigue was common and noted in 65% to 75%.
- Other symptoms included fever, headache, cough, myalgia, arthralgia, and nausea.
- Rash was uncommon and is typically described as a diffuse maculopapular eruption in patients given ampicillin.

- On examination, pharyngitis with mildly painful anterior and posterior cervical lymphadenopathy was detected in 75% of patients,
- splenomegaly and/or hepatomegaly were detected in approximately 35% of patients
- during the first two weeks of the illness with minimally elevated transaminase levels in more than half of the group
- The pharyngitis that accompanies IM is subacute in onset and may be accompanied by mild-to-moderate enlargement of the tonsils as well as exudates and palatal petechiae.
- Symptoms substantially improve over the first month of illness and after 6 months are almost completely resolved..

Group A Streptococcus

GAS is the only common cause of sore throat that should be treated with antibiotics. The principal goal in the evaluation of adults with sore throat is to identify patients likely to have *GAS* pharyngitis, or "strep throat."

Prompt antibiotic treatment of adults likely to have strep throat has the potential to reduce symptoms, prevent the spread of disease, and reduce suppurative complications (e.g., peritonsillar abscess).

Nonsuppurative complications are rare. In developed countries, the prevalence of rheumatic fever is extremely low, and antibiotic treatment does not prevent poststreptococcal glomerulonephritis

About 10% of adults with sore throat are infected with *GAS*.

Among children with sore throat, the prevalence of *GAS* can be as high as 35%, with rates peaking from 5 to 15 years of age.

The prevalence of *GAS* is higher in winter and early spring.

The risk of streptococcal pharyngitis is elevated among health care and child care workers, teachers, parents of young children, and patients exposed to individuals with strep throat.

Clinicians need to be aware of local outbreaks of *GAS* infection, particularly in military and institutional settings, where the prevalence of *GAS* and the risk of acute rheumatic fever may be elevated.

Group A Streptococcus

- Pharyngitis attributable to GAS is sudden throat associated with GAS may result in difficulty swallowing.
- Fever, headache, and gastrointestinal symptoms
- Physical examination generally reveals pharyngeal erythema, tonsillar enlargement, and a gray-white exudate covering the posterior pharynx and tonsillar pillars.
- Petechiae are sometimes observed on the soft palate, with erythema and edema of the uvula.
- Anterior cervical lymphadenopathy, often at the angle of the jaw, is typical of GAS pharyngitis
- Signs and symptoms most indicative of GAS pharyngitis are tonsillar or pharyngeal exudates, tender anterior cervical nodes, fever or history of fever, and absence of cough.

Suggestive of Group A *Streptococcus*

Sudden onset

Sore throat

Fever

Headache

Nausea, vomiting, and abdominal pain

Inflammation of pharynx and tonsils

Patchy discrete exudates

Tender, enlarged anterior cervical nodes

Patient aged 5–15 yr

Presentation in winter or early spring

History of exposure



The Centor Criteria and the Probability of Streptococcal Pharyngitis for Adults^a

NO. OF CRITERIA MET ^b	POSTEVALUATION PROBABILITY (%)	RECOMMENDATION
0	2	No test, no antibiotic
1	3	No test, no antibiotic
2	8	Rapid test
3	19	Rapid test
4	41	Empirical antibiotic treatment or rapid test

The criteria are (1) a history of fever, (2) an absence of cough, (3) tender anterior cervical lymphadenopathy, and (4) tonsillar swelling or exudate.

Each criterion gets 1 point.

Roughly 40-60% of adults will meet no criteria or one criterion; ~20% will meet the criteria for antibiotic prescribing.

In children, the Centor criteria are less specific, and streptococcal pharyngitis should be confirmed with testing.

Children who have signs of pharyngitis without signs of viral infection (conjunctivitis, runny nose, cough, hoarseness, nonexudative oral lesions) should have testing performed.

TREATMENT

Streptococcal Pharyngitis

All patients with pharyngitis— nonstreptococcal and streptococcal—should receive analgesics (acetaminophen or NSAIDs).

Saline gargles, humidification, soft foods, and tea with honey soothe a painful throat.

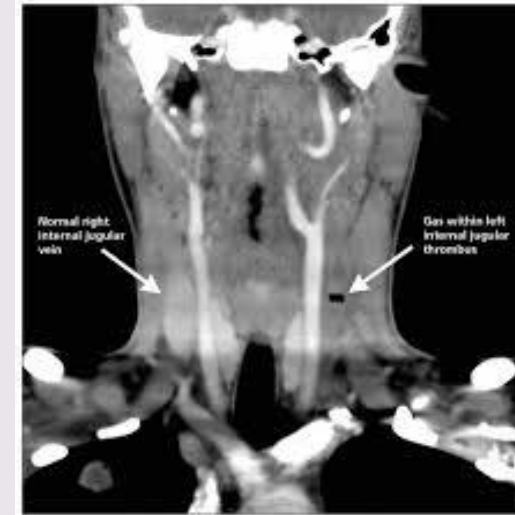
Antibiotic Treatment of Group A Streptococcal Pharyngitis

ANTIBIOTIC	DOSING
Antibiotic of Choice	
Penicillin	500 mg PO qid or 1000 mg PO bid × 10 days
Alternative for Non-Penicillin-Allergic Patients	
Amoxicillin	500 mg PO bid or 1000 mg qd × 10 days
Alternatives for Non-Anaphylactic Penicillin-Allergic Patients	
Cephalexin	500 mg PO bid × 10 days
Cefadroxil	1 g PO qd × 10 days
Alternatives for Patients with Severe Penicillin Allergy	
Erythromycin	250–500 mg PO qid or 500–1000 mg PO bid × 5 days
Clarithromycin	500 mg PO bid × 5 days
Clindamycin	300 mg PO tid × 10 days

DRUG	DOSE	DURATION
Oral Regimens		
Penicillin V	Children: 250 mg bid or tid Adolescents and adults: 250 mg tid or qid or 500 mg bid	10 days
Amoxicillin	50 mg/kg once daily (maximum 1000 mg) Alternative: 25 mg/kg bid (maximum 500 mg)	10 days
For Penicillin-Allergic Patients		
Erythromycin	Varies with formulation	10 days
First-generation cephalosporins	Varies with agent	10 days
Intramuscular Regimens		
Benzathine penicillin G	600,000 units for patients <27 kg	1 dose
	1.2 million units for patients ≥27 kg	1 dose
Mixtures of benzathine and procaine penicillin G	Varies with formulation	1 dose

Fusobacterium necrophorum

- Septic thrombophlebitis of the internal jugular vein (Lemierre disease).
- The illness typically starts as a sore throat which may present as exudative tonsillitis or peritonsillar abscess.
- Infection of the deep pharyngeal tissue allows organisms to drain into the lateral pharyngeal space, which contains the carotid artery and internal jugular vein.
- pain, dysphagia, and unilateral neck swelling and stiffness.
- Sepsis usually occurs 3-10 days after the onset of sore throat and is often coupled with metastatic infection to the lung and other distant sites, with pulmonary abscess or empyema.
- treatment ; a penicillin in combination with a β -lactamase inhibitor (e.g., [ampicillin/sulbactam](#)) together with [metronidazole](#).
- **Fusobacterium species are universally resistant to macrolide antibiotics (e.g., azithromycin) and have been increasingly noted to show resistance to clindamycin.**



RHINOSINUSITIS



an inflammatory condition involving the nasal sinuses.

Although most cases of sinusitis involve more than one sinus, the maxillary sinus is most commonly involved; next, in order of frequency, are the ethmoid, frontal, and sphenoid sinuses.

Viral rhinosinusitis is far more common than bacterial sinusitis

viruses most commonly isolated—both alone and with bacteria—have been rhinovirus, parainfluenza virus, and influenza virus.

Bacterial causes of sinusitis have been better described.

S. pneumoniae and nontypable *Haemophilus influenzae*

Moraxella catarrhalis

Treatment Acute Rhinosinusitis

- Moderate symptoms (e.g., nasal purulence/congestion or cough) for >10 d or
- Severe symptoms of any duration, including unilateral/focal facial swelling or tooth pain

ANTIMICROBIAL	ADULT DOSAGE	PEDIATRIC DOSAGE
Amoxicillin	500–875 mg q12h	40–80 mg/kg/day divided q12h
Amoxicillin/clavulanate <u>a.(tn0040)</u>	875 or 2000 mg 12h	40–80 mg/kg/day divided q12h
Cefpodoxime proxetil	200 mg 12h	10 mg/kg/day divided 12h
Cefixime <u>b.(tn0045)</u>	400 mg q12–24h	8 mg/kg/day divided q12–24h
Cefdinir	300 mg q12h or 600 mg q24h	14 mg/kg/day divided 12–24h
Azithromycin <u>c.(tn0050)</u>	500 mg daily for 3 days	10 mg/kg daily for 3 days
Clarithromycin <u>c.(tn0050)</u>	500 mg q12h for 14 days 1000 mg daily for 14 days	15 mg/kg/day divided q12h
Levofloxacin	500 mg daily	16–20 mg/kg/day divided every 12h <u>b.(tn0045)</u>
Moxifloxacin	400 mg daily	400 mg daily for adolescents <u>b.(tn0045)</u>

Treatment Recommendations^a

Initial therapy:

Amoxicillin/clavulanate, 500/125 mg PO tid or 875/125 mg PO bid^b

Penicillin allergy:

Doxycycline, 100 mg PO bid; *or*

An antipneumococcal fluoroquinolone (e.g., moxifloxacin, 400 mg/d PO daily)^c

Exposure to antibiotics within 30 d or >30% prevalence of penicillin-resistant Streptococcus pneumoniae:

Amoxicillin/clavulanate (extended release), 2000/125 mg PO bid; *or*

Doxycycline, 100 mg PO bid; *or*

An antipneumococcal fluoroquinolone (e.g., moxifloxacin, 400 mg PO daily)^c

Recent treatment failure:

Amoxicillin/clavulanate (extended release), 2000 mg PO bid; *or*

An antipneumococcal fluoroquinolone (e.g., moxifloxacin, 400 mg PO daily)^c

*Thank
you*

