
Respiratory Disorders

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I. Background Information

- A. Sinusitis
- B. Common Cold
- C. Pharyngitis
- D. Laryngitis
- E. Laryngotracheobronchitis
- F. Asthma
- G. Bacterial Pneumonia
- H. Viral Pneumonia
- I. *Mycoplasma* Pneumonia
- J. *Pneumocystis carinii* Pneumonia

II. Establishing the Diagnosis

- A. Sinusitis
- B. Common Cold
- C. Pharyngitis
- D. Laryngitis
- E. Laryngotracheobronchitis
- F. Asthma

G. Bacterial Pneumonia

- H. Viral Pneumonia
- I. *Mycoplasma* Pneumonia
- J. *Pneumocystis carinii* Pneumonia

III. Clinical Intervention

- A. Sinusitis
- B. Common Cold
- C. Pharyngitis
- D. Laryngitis
- E. Laryngotracheobronchitis
- F. Asthma
- G. Bacterial Pneumonia
- H. Viral Pneumonia
- I. *Mycoplasma* Pneumonia
- J. *Pneumocystis carinii* Pneumonia

IV. Case Study

V. Suggested Reading

Background Information

Like it or not, patients with respiratory complaints are a part of our practice. The common cold is often referred to as the most frequent illness occurring in humans: over 40% of Americans suffer from a “cold” each year, accounting for more lost productivity than any other illness. Pharyngitis affects almost 30 million patients annually, with over 10% of all school-aged children seeking medical care each year. Seventeen million patients a year are diagnosed with asthma, with more females than males among adult-onset patients. Whether it is the reason for our patient’s visit or an incidental complaint, we are involved with the diagnosis and management of these problems.

Sinusitis

Sinusitis affects roughly 35 million people in the United States annually. The accumulation of purulent material in inflamed paranasal sinuses results in a feeling of fullness and pressure in and over the involved sinuses. These symptoms are worse with posture changes, bending, or with air travel—anything that alters pressure inside the sinuses. Nasal congestion and a purulent, blood-tinged discharge, general malaise, low-grade fever, and sore throat are common. These patients will have tenderness over the involved sinuses and edematous or thickened mucosa may be noted on physical examination. These findings help to differentiate sinusitis from the more common cold.

The most common cause of sinusitis is bacterial infection with *Haemophilus influenzae*, pneumococci, or streptococci. Viral and fungal infections may occur, but are less common. Upper respiratory infections, allergy, or air travel often precede the development of sinusitis, and secondary infection from a tooth abscess or from swimming in contaminated water may also create a sinus infection.

Common Cold

Affecting roughly 41% of people per year, the symptoms of the common cold are familiar. The sneezing, runny nose, and malaise usually lasts 6–10 days, but may range from 2 to 26 days. Coryza (rhinorrhea and sneezing) is present in 50–66% of patients, and almost 50% of patients experience pharyngitis with a cold. Hoarseness and cough develop in 25–50% of patients. Between 25% and 45% of patients experience headache, muscular aches, lethargy, and malaise, though only 15–30% actually develop fever or chills. Surprisingly, up to 25% of patients infected with the usual cold viruses will not develop symptoms.

The patient's symptoms generally begin with the loss of a sense of well-being, scratchy eyes, and discomfort in the nose or back of the throat (Fig. 19.1).

This is soon followed by sneezing and nasal obstruction with a clear, watery discharge. Systemic symptoms, which reach their peak in the first 2–3 days, resolve first, followed by a change in nasal discharge to a cloudy or yellow, thick character. A sore throat, cough, or hoarseness may persist up to 10 days.

Transmission of the causative virus is usually by personal contact; infected droplets of respiratory discharge are spread by coughing and sneezing, and by transfer from the hands to the eyes, nose, or face. Experimental evidence suggests that small doses of virus (1–30 particles) are sufficient to produce infection. Healthy people with normal immune systems are highly susceptible to cold virus infection once the virus enters the nose. In volunteer studies, approximately 95% of normal adults became infected when virus was dropped into the nose.

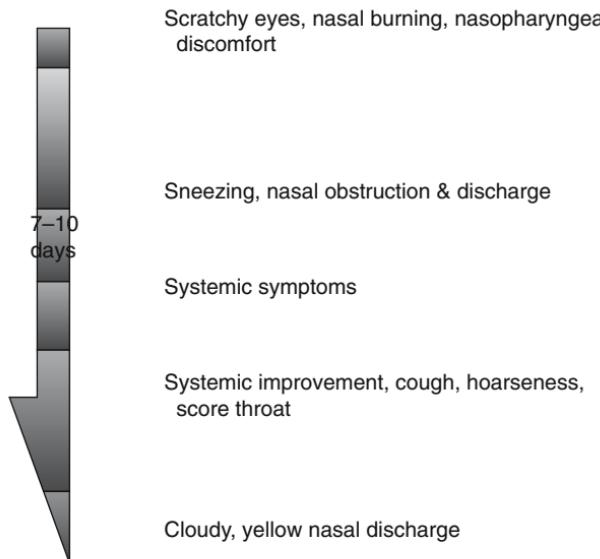


Fig. 19.1. Sequence of symptoms of the common cold.

Cold viruses are carried to the back of the throat by ciliary action where they are deposited in the area of the adenoids, where the viruses attach. From the time a cold virus enters the nose, it takes 8–12 hours for the viral reproductive cycle to be completed and for new cold virus to be released in nasal secretions. Cold symptoms can begin shortly after virus is first produced in the nose (10–12 hours). The time from the beginning of the infection to the peak of symptoms is typically 36–72 hours.

There are over 100 serotypes of rhinoviruses that may cause the common cold. These account for about 15–40% of infections. Additional viral agents include coronaviruses (10–20% of cases), influenza types A, B, and C (1–5%), parainfluenza (1–5%), respiratory syncytial virus (1–5%), adenoviruses (1–5%), and others. No specific agent is known in 30–50% of cases, though it is presumed to be viral.

Any exposure to an infected person places you at risk for infection. Consequently, anything that brings larger numbers of people together, such as daycare, schools, or the work place, increases the chances of infection. The secondary attack rates in families is approximately 25%. Cold weather, fatigue, and loss of sleep do not appear to alter the risk of infection, though colds are most prevalent in the winter months. Careful hand washing may reduce the risk, especially among those chronically exposed (e.g., health care workers). Data regarding the protective effects of large doses of vitamin C are inconclusive.

Pharyngitis

Only 12–25% of all “sore throats” seen by physicians have a true pharyngitis—most are simple viral upper respiratory infections such as the common cold. Of greatest priority is the identification and treatment of those with group A streptococcal infections so as to reduce the potential for rheumatic sequelae. Despite roughly 30 million cases annually, the incidence of rheumatic fever has declined to approximately 64 cases per 100,000. Streptococcal pharyngitis has its greatest incidence between the ages of 5 and 18 years, but is still common in patients seen in a gynecology office setting. (See Fig. 19.2 for a decision tree for sore throats.)

A sore throat, tonsillar enlargement (often with exudates), soft palate petechiae, and cervical adenopathy characterize true pharyngitis. Hoarseness and lower respiratory symptoms should be absent. Streptococcal pharyngitis usually runs a 5–7 day course, with a peak fever at 2–3 days. This time course and the presence of a moderate to high fever help to differentiate true pharyngitis from the common cold. Spontaneous resolution of symptoms generally occurs, but rheumatic complications are still possible.

Viral agents, including rhinovirus, adenovirus, and parainfluenza viruses, cause most pharyngitis. *Neisseria gonorrhoeae*, *Corynebacterium diphtheriae*, and *H. influenzae* may also cause bacterial pharyngitis. The same factors that increase the risk of the common cold (close quarters, unhygienic practices) also increase the risk of pharyngitis.

Laryngitis

Viral infections with influenza A or B, parainfluenza, or adenovirus, or bacterial infections by β -hemolytic streptococcus or *Streptococcus pneumoniae* are the most common etiology for laryngitis. Excessive or improper voice use (strain) or aspiration may also result in loss of voice. An upper respiratory tract infec-

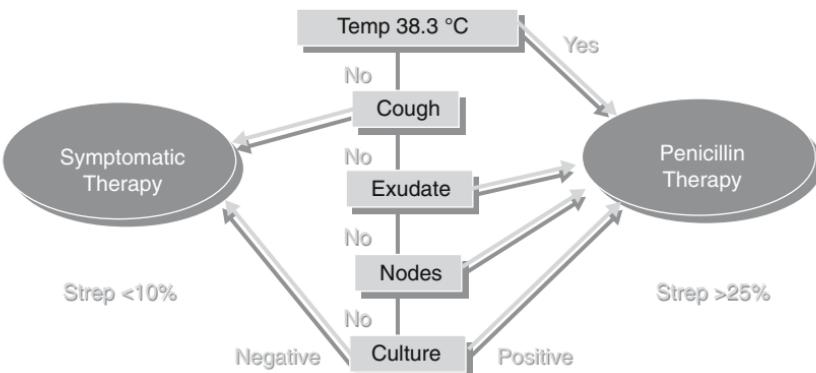


Fig. 19.2. Decision tree for sore throat.

tion, bronchitis, or pneumonia often precedes laryngitis. Environmental causes such as smoking or being in an environment with second-hand tobacco smoke can also cause laryngitis. In the industrial or school environment, exposure to irritating chemicals can also lead to similar symptoms. The peak incidence of laryngitis parallels epidemics of the individual viruses (winter).

Laryngotracheobronchitis

This subacute viral illness is noteworthy for its barking cough, biphasic stridor, and risk of airway obstruction. While more common in children (the most common cause of stridor in children), the potential for serious complications (e.g., acute obstruction) makes it an illness that should be familiar to gynecologists. Patients with laryngotracheobronchitis often have had an upper respiratory prodromal infection in the last 1–7 days. Fatigue, malaise, low-grade to moderate fever, and a normal voice characterize the patient's symptoms. The uncomplicated disease usually wanes in 3–5 days but may persist for as many as 10 days.

Most cases of laryngotracheobronchitis are caused by viral infection (parainfluenza, influenza A, and others). Recurrent upper respiratory infections increase the risk of developing laryngotracheobronchitis. As the infection extends to the proximal trachea, diffuse inflammation with exudate and edema of the subglottic area causes narrowing of the airway. The cricoid ring of the trachea (in the immediate subglottic area) is the narrowest portion of the airway. A small amount of edema in this region can cause significant airway obstruction. (The resistance to flow through a tube is inversely proportional to the fourth power of the radius.) Air flowing through this narrowed subglottic area causes the characteristic stridor.

Asthma

With over 10 million new cases diagnosed each year, asthma affects up to one in five children in the United States—more than 4.8 million children under the age of 18. Direct health care costs for asthma (adults and children) in the United States total more than \$9.8 billion annually; indirect costs (lost productivity) add another \$2.8 billion for a total of \$12.6 billion. Inpatient hospital services represented the largest single direct medical expenditure, over \$4.2 billion. The prevalence of asthma increased 75% from 1980 to 1994, and currently affects more than 17 million Americans. Researchers have yet to pinpoint the cause for the increase in asthma. Allergic rhinitis is considered a risk factor in developing asthma, as up to 78% of people with asthma also have allergic rhinitis. While it is tempting to think of asthma as a childhood condition that is not seen in a gynecologic practice, half of all asthma cases occur in patients over the age of 10, and more women than men make up this adult onset group.

Asthma is a chronic inflammatory disorder involving constriction of the muscles lining the bronchial airways. Physical symptoms of asthma include coughing, wheezing, tightness of the chest, and shortness of breath.

Narrowing of both the large and small airways results in the wheezing, cough, and dyspnea typical of this condition. Hyperresonance and decreased breath sounds are found on clinical examination.

Allergy, exposure to smoke or other pollutants, viral infections, exercise, or even aspirin intake may induce these episodic attacks. While there is a familial association of reactive airway disease, no known genetic pattern exists. Other triggers that may play a significant role in provoking asthma attacks are shown in Table 19.1.

Asthmatic patients who become pregnant can expect their condition to remain the same or improve (75% of cases). In about 25% of cases, asthma worsens during pregnancy.

Bacterial Pneumonia

More common in adults than its viral cousin, bacterial pneumonia has an annual incidence of approximately 20 per 1000 population. Of these, approximately 60% are community acquired and 40% are acquired in a hospital or nursing home setting. Alcoholics, the debilitated, postoperative patients, patients with respiratory diseases or viral infections, and those who have weakened immune systems are at greater risk.

The cardinal signs of bacterial pneumonia are a cough, fever and chills, chest pain, and a thick dark or bloody (rusty) sputum. Malaise, myalgia, and abdominal, shoulder, or pleuritic pain may also be present. Rales and rhonchi, decreased breath sounds, and vocal fremitus may be found on examination. The tissue of part of a lobe of the lung, an entire lobe, or even most of the lung becomes completely filled with liquid (consolidation). The infection may quickly spread through the bloodstream, resulting in septicemia or bacterial seeding to other sites.

Hematogenous spread or direct inhalation of the organism (*S. pneumoniae*, *H. influenzae*, *Staphylococcus aureus*, *Legionella pneumophila*, and

Table 19.1. Agents that may precipitate or provoke asthma.

Allergens such as pollens, molds, animal dander, dust mites, and cockroaches

Irritants such as strong odors and sprays, chemicals, air pollutants, tobacco smoke, and cold air

Viral or sinus infections including colds, pneumonia, and sinusitis

Exercise, especially in cold, dry air

Gastroesophageal reflux disease (GERD), a condition in which stomach acid flows back up the esophagus

Medication and foods

Emotional anxiety

Table 19.2. Recommended groups for pneumonia vaccination.

Those with chronic illnesses such as lung disease, heart disease, kidney disorders, sickle cell anemia, or diabetes
Those recovering from severe illness
Those in nursing homes or other chronic care facilities
Age 65 or older

others) is the most common source of infection for most patients. *S. pneumoniae* is the most frequent cause of bacterial pneumonia and is the one form of pneumonia for which a vaccine is available. Anything that diminishes the host's defenses increases the risk of becoming ill. Alcoholism and smoking, immunosuppression and AIDS, chronic disease, malnutrition, and advanced age are all associated with an increased risk. Groups for whom vaccination should be recommended are shown in Table 19.2.

Viral Pneumonia

Viral pneumonia has signs and symptoms similar to those of bacterial pneumonia, with fever, chills, and a productive cough the predominant symptoms. As with bacterial infections, a preceding upper respiratory tract infection is common. Rales, rhonchi, and altered breath sounds are typical findings on examination.

While 90% of childhood pneumonia is viral, only between 1% and 5% of adult pneumonias are caused by viral infections. Influenza A and B, as well as parainfluenza (1, 2, 3, and 4), and respiratory syncytial virus may also be common agents. Varicella, herpes simplex, and rubeola are atypical causative organisms but account for significant morbidity when they are the causative agents. Infection with the influenza virus may be severe and occasionally fatal. The virus invades the lungs and multiplies, but there are almost no physical signs of lung tissue becoming filled with fluid. Fatalities are most common among those who have preexisting heart or lung disease or are pregnant.

***Mycoplasma* Pneumonia**

Because of its somewhat different symptoms and physical signs, and because the course of the illness differed from classic pneumococcal pneumonia, *Mycoplasma* pneumonia was once believed to be caused by one or more undiscovered viruses and was called "primary atypical pneumonia." Mycoplasmas generally cause a mild and widespread pneumonia that can affect all age groups, occurring most frequently in older children and young adults. The death rate is low, even in untreated cases.

Little separates *Mycoplasma* pneumonia from viral pneumonia except for the presence of cold agglutinins. A prodromal period of mild sore throat,

low-grade fever, and malaise generally precedes the development of paroxysmal cough and blood-streaked sputum.

Confined living spaces (such as military bases, college campuses, and hospitals) increase the risk of *Mycoplasma* epidemics. Immunocompromised patients are also at higher risk for infection.

***Pneumocystis carinii* Pneumonia**

Pneumocystis carinii pneumonia is caused by an organism believed to be a fungus and is frequently the first sign of illness in many persons with AIDS. This often insidious infection is seen almost exclusively in immunocompromised individuals. Weakness, fatigue, malaise, fever and chills, and mild dyspnea on exertion are typical. A mild nonproductive cough or a cough productive of only scant amounts of clear sputum is common.

Establishing the Diagnosis

Sinusitis

The clinical signs and symptoms present most often establish the diagnosis of sinusitis. Sinus X-rays will show cloudiness and air-fluid levels with thickened mucosa in the affected sinuses, but are not required for diagnosis in most cases. Computed tomography and magnetic resonance imaging are not indicated in these patients. Transillumination of the affected sinuses will reveal opacity. A mildly elevated white blood cell count may be found and appropriate cultures (especially in chronic sufferers) may be of help, and can help to separate cases of viral and allergic rhinitis from those of bacterial infection. The possibility of a foreign body must always be considered.

Common Cold

The diagnosis of the common cold is made on clinical grounds with testing rarely indicated and useful only when other conditions are suspected. Viral culture or isolation is not practical and should not be undertaken. Influenza, rubeola and rubella, *Mycoplasma* pneumonia, group A β -hemolytic streptococcal infections, and allergic rhinitis may all be confused with the common cold and should be considered when appropriate.

Pharyngitis

In addition to the patient's symptoms, a throat culture (on blood agar) or a rapid screening test for *Streptococcus* is indicated because history and physical examination are only 50% accurate in establishing the diagnosis. Because of a sensitivity of 80% and specificity of 95% for most rapid screening tests, a follow-up culture is indicated even if the rapid test is used for the initial screening. A fever of greater than 39.2°C (102.5°F), white blood count of greater than 12,000, or a scarlet fever rash (punctate erythematous macules with reddened flexor creases and circumoral pallor) is suggestive of a streptococcal infection and requires more aggressive evaluation and treatment. A gray pseudomem-

brane suggests the presence of diphtheria and vesicles should suggest herpes stomatitis as alternate diagnoses.

Laryngitis

The diagnosis of laryngitis is made primarily on the patient's symptoms. The hallmarks of laryngitis are hoarseness, abnormal sounding voice, or loss of voice. Feelings of throat tickling or rawness, coupled with a frequent urge to clear the throat, are also common. Like the cough of the common cold, laryngitis may continue after the acute infection is over. This can be recognized by noting that the fever and ill feeling have resolved, but the hoarseness continues for several days to a week or longer. Direct or indirect laryngoscopy is diagnostic but generally beyond the interest of most gynecologists.

Laryngotracheobronchitis

Laryngotracheobronchitis must be differentiated from epiglottitis, foreign body aspiration, diphtheria, and simple upper respiratory infections. X-Rays of the neck (PA and lateral) will show a characteristic narrowing in the subglottic region with a normal epiglottis (an inverted V-shaped "steeple" or "pencil" sign). Direct laryngoscopy is often required to establish the final diagnosis. Early in the course of the disease leukopenia may be present with leukocytosis occurring in later, more severe cases. Because hypoxia may be insidious and occurs in up to 80% of children with laryngotracheobronchitis, pulse oximetry should be considered. Even in adults, the condition of the patient can change rapidly, necessitating early consultation and aggressive management.

Asthma

Allergists follow the national *Guidelines for the Diagnosis and Management of Asthma* (National Asthma Education and Prevention Program, National Institutes of Health, 1997) to diagnosis and establish treatment plans for patients with asthma and other allergic diseases. The diagnosis of asthma is made mainly on the basis of the recurrent clinical pattern. Allergy testing, spirometry, and chest X-ray may support or clarify the diagnosis. Unusual conditions such as recurrent pulmonary emboli and cystic fibrosis, or more common processes such as congestive heart failure and tuberculosis, must all be considered. Special attention should be paid to the nose and sinuses for evidence of chronic infection. A spirometer may be used to objectively measure the amount of air inhaled and exhaled and to determine the level of airway obstruction, though the simple bedside test of asking the patient to blow out a match held at arm's length can provide a quick assessment of forced expiratory volume (FEV₁).

Bacterial Pneumonia

Frequently, the criteria for diagnosis have been fever, cough, and development of purulent sputum, in combination with radiologic evidence of a new or progressive pulmonary infiltrate, a suggestive Gram stain, and cultures of sputum, tracheal aspirate, pleural fluid, or blood. Unfortunately, symptoms, elevated

white blood count with left shift, hemoconcentration, hyponatremia, and transaminase elevations are all nonspecific signs of bacterial pneumonia.

The onset of bacterial pneumonia can vary from gradual to sudden. In the most severe cases, the patient may experience shaking chills, chattering teeth, severe chest pain, and a cough that produces rust-colored or greenish mucus. The patient's temperature may rise as high as 105°F. The patient sweats profusely, and breathing and pulse rate increase rapidly. Lips and nail beds may demonstrate hypoxia and confusion or delirium may be present.

The chest X-ray will show air bronchograms and consolidation, with pleural effusion common. Blood cultures will be positive in 20–30% of patients with community-acquired infections. Bronchoscopic cultures with greater than 10,000 organisms are diagnostic, but beyond the capability of most gynecologists. Induced sputum for culture and Gram stain may be helpful, but are less reliable.

Viral Pneumonia

The initial symptoms of viral pneumonia are the same as influenza symptoms: fever, a dry cough, headache, muscle pain, and weakness. Within 12–36 hours, there is increasing breathlessness; the cough becomes worse and produces a small amount of mucus. There is a high fever and there may be hypoxia and cyanosis. In extreme cases, the patient has a desperate need for air and extreme breathlessness. Exclusion of the more common bacterial pneumonia and the addition of viral culture or fluorescent antigen studies establish the diagnosis of viral pneumonia.

***Mycoplasma* Pneumonia**

The most prominent symptom of *Mycoplasma* pneumonia is a cough that tends to come in violent attacks, but produces only sparse whitish mucus. Chills and fever are early symptoms, and some patients experience nausea or vomiting. Patients may experience profound weakness that lasts for a long time. The presence of cold agglutinins in a titer of 1:64 or greater, or with a fourfold rise in titers, is found in 50% of infections. Cultures for *Mycoplasma* take 7–10 days, so are of little use in making the acute diagnosis.

***Pneumocystis carinii* Pneumonia**

Suspicion greatly aids the diagnosis. Chest X-ray shows bilateral interstitial or perihilar infiltrates in 75% of cases, though a normal chest X-ray may be present. Serum lactate dehydrogenase (LDH) is often elevated (average 340 IU) and CD4 cell counts are generally depressed (<200) in HIV-infected patients.

Clinical Intervention

Sinusitis

Outpatient care for patients with sinusitis is appropriate except when there is involvement of the frontal or sphenoid sinuses. For simple cases involving the

other sinuses, steam inhalation will provide some comfort and promote drainage. Irrigation with saline may be recommended, but is seldom required. Amoxicillin (500 mg three times a day) or trimethoprim-sulfamethoxazole twice a day for 14–21 days will generally provide good coverage for the most common causative organisms. Recent data suggest that treatment courses of as little as 3 days may be sufficient in uncomplicated cases. With proper antibiotic treatment, over 90% of cases of acute bacterial sinusitis are cured. If response is not forthcoming, a switch to an antibiotic with activity against β -lactamase-producing bacteria is prudent. Cases of acute bacterial sinusitis that do not clear after a few months of appropriate medical treatment may require sinus surgery. Analgesics, vasoconstrictors to relieve fullness, and antihistamines may all be used as needed. Patients should be advised to avoid alcohol and caffeine because both may result in swelling of the sinus membranes.

Though rare, sinusitis may lead to meningitis, extradural, subdural, or brain abscesses, osteomyelitis, or septic cavernous sinus thrombosis. Patients with chronic or recurrent sinusitis may require surgical drainage.

Common Cold

Common sense and supportive therapies are all that are required for most patients suffering from the common cold. Rest, fluids (including fruit juices), smoking cessation, and humidification may all be of some help. The best strategy for treating a cold is to start treatment as soon as there is the recognition that a cold is beginning and to continue treatment on a regular basis until it appears that the cold is over (3–7 days). Analgesics, oral decongestants (pseudoephedrine, phenylephrine, and phenylpropanolamine), antitussives (dextromethorphan, codeine) combined with mucolytics (guaifenesin), antihistamines, and topical decongestants (oxymetazoline) may all provide some relief.

Early studies of the first generation antihistamines for the treatment of colds gave negative results because of inadequate precision in symptom recording. Subsequent studies have demonstrated that first generation antihistamines are quite effective in reducing the sneezing and runny nose of colds. The use of topical decongestants should be limited to 3–4 days to avoid rebound hyperemia and congestion. Decongestants taken by mouth have less powerful and immediate activity but cause fewer problems with the cycles of recurrent nasal obstruction than topical preparations.

There is some evidence that supplemental vitamin C may reduce the duration of disability. The use of zinc gluconate lozenges has been shown to reduce the duration of symptoms but they must be used frequently and are often associated with nausea. The use of zinc (gluconate) lozenges has been shown to reduce the duration of symptoms by roughly one-half if used early in the course of the infection. In clinical trials, doses of 13–15 mg every 2 hours while symptoms persist have been used. Studies using intranasal ipratropium bromide (Atrovent) three times daily have demonstrated a reduction in rhinorrhea and sneezing. Efforts to either treat or prevent the common cold with Echinacea preparations have had variable success when subjected to randomized trials.

The use of antibiotics has only a limited role in the treatment of the common cold and should be discouraged. When a common cold has lasted for 7–10 days and is no better or worse, acute bacterial sinusitis may have developed and additional medical care may be required. For this reason, antibiotics may be indicated when symptoms continue unabated for more than 10 days. After this time, the probability of a secondary bacterial infection increases to roughly 80%. Erythromycin, amoxicillin, and sulfisoxazole-trimethoprim are reasonable empiric choices at this point.

Pharyngitis

Symptomatic treatments for pharyngitis include salt-water gargles, acetaminophen, dyclonine lozenges, and use of a cool mist humidifier. Smoking cessation and voice rest are always indicated. When a streptococcal infection is suspected (i.e., when a high fever is present), treatment with penicillin, penicillin VK (250 mg three times daily), erythromycin ethylsuccinate (300–400 mg three times daily), or cephalixin (250 mg three times daily) should be started and continued for a full 10 days. Azithromycin is also effective, with its higher cost partially offset by the shorter (5 day) course of therapy. Patients are considered noninfectious after 24 hours of antibiotic coverage.

Complications from pharyngitis are rare and are generally restricted to the bacterial forms. The greatest concern is the development of rheumatic fever and its sequelae. Poststreptococcal glomerulonephritis, peritonsillar abscess, otitis media, and systemic infections are also possible complications.

Laryngitis

Usually, laryngitis is self-limiting. However, children's croup or acute epiglottitis can present like laryngitis. The primary treatment of laryngitis is voice rest, humidity (steam or cool mist), increased fluids, antipyretics, and analgesics (Table 19.3). Smoking should be stopped. Penicillin G (250 mg every 6 hours for 10–12 days) is indicated when streptococcal or pneumococcal infections are suspected. Indications for further investigation or that a change in therapy is needed are shown in Table 19.4.

Laryngotracheobronchitis

In mild cases, outpatient treatment with humidification, fluids, rest, and analgesics may suffice. Dexamethasone has been shown to reduce symptoms in patients with moderate-to-severe croup and is frequently used in children. Because of the possibility of acute airway obstruction, more severe cases require hospitalization and intensive monitoring by those familiar with the disease.

Asthma

Although there is no cure for asthma, there are effective treatment methods. Successful management of asthma consists of four components: (1) patient education, (2) reduction of environmental triggers (allergens), (3) measurement and monitoring of pulmonary function, and (4) pharmacologic intervention.

Table 19.3. Simple interventions for laryngitis.

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- Suck on cough drops, a throat lozenge, or hard candy
 - Stop smoking
 - Avoid places where cigarettes are smoked
 - Use a humidifier (cool mist ultrasonic humidifiers are preferred—these are more expensive than the usual vaporizer, but are safer and more effective); you can also try standing in a hot shower
 - Use aspirin, ibuprofen, or acetaminophen for temperature, muscle discomfort, and pain; do not give aspirin to anyone less than 19 years of age—it can trigger an attack of Reyes syndrome
 - Gargle with warm salt solution (1/2 tsp salt in 1 cup of water)
 - Speak softly, but do not whisper; use a notebook and pencil to communicate
 - Drink warm liquids like hot Tang or honey and lemon
-

Medication therapies are designed to minimize the airway inflammation component of asthma as well as to treat airway narrowing. Environmental control measures are implemented to avoid or eliminate factors that induce or trigger asthma flare-ups. Immunotherapy may also be considered if allergies are known to be an asthma trigger, a condition that is most common in children.

The treatment of asthma is based on five major classes of drugs: antiinflammatory agents (cromoglycate and nedocromil), steroids (beclomethasone, prednisone), β -agonists (albuterol, terbutaline), methylxanthines (theophylline), and anticholinergics (atropine, ipratropium bromide). A sixth class has gained favor recently: antileukotrienes or leukotriene modifiers.

Table 19.4. Indications for reevaluation or a change in therapy for laryngitis.

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- Difficulty breathing
 - Fever over 101°F
 - Difficulty swallowing
 - Deep cough or, in a young child, a cough like the bark of a seal (suggestive of laryngotracheobronchitis)
 - Brown, green, or yellow sputum
 - Hoarseness that persists for 1 month or more
 - Inability to carry on normal activities
 - Symptoms of gasping or drooling
-

Leukotrienes are responsible for the contraction of the airway smooth muscle, increasing leakage of fluid from cells in the lung, and further promoting inflammation by attracting other inflammatory cells into the airways. Recently, new antileukotriene medications have been introduced to fight the inflammatory response typical of allergic disease. These drugs are generally limited to the treatment of chronic asthma, though recent data have demonstrated that antileukotriene therapy can be beneficial for many patients with less chronic asthma. It is likely that these newer medications will eventually have an increased role in asthma care as more studies are conducted. Comanagement with both the patient and an asthma specialist is essential when the disease is advanced.

Mild cases of asthma (brief wheezing one to two times per week) are often managed by intermittent use of β -agonists or theophylline. Bronchodilators are generally used as "rescue medications" to relieve coughing, wheezing, shortness of breath, and difficulty in breathing. Those patients with weekly symptoms that interfere with sleep, exercise, or work require a regular maintenance schedule with cromolyn qid or nedocromil bid, with inhaled steroids as an adjunct. Theophylline is added when symptoms worsen. Salmeterol is a long-acting bronchodilator that, along with an antiinflammatory medication, is used for maintenance in the long-term control of asthma symptoms.

Both patients and physicians must be aware of several potential pitfalls in management: Not recommended are mist therapy, fluid loading, breathing exercises, or intermittent positive-pressure breathing (IPPB) therapy. Erythromycin and ciprofloxacin can slow theophylline clearance resulting in increased levels of as much as 15–20% and possible toxicity.

Bacterial Pneumonia

In addition to common sense support measures, antimicrobial therapy for the most likely organisms is required. For community acquired infections, empiric treatment with erythromycin (500 IV every 6 hours) provides good coverage, including coverage for *Mycoplasma* and *Legionella*. For patients with nosocomial infections, third-generation cephalosporins (cefotaxime, ceftizoxime) plus vancomycin are recommended.

In otherwise healthy adults, improvement should occur in 1–3 days. Despite clinical improvement, it may take quite some time for the chest X-ray to clear, necessitating repeated studies for up to 6 weeks. Mortality rates for bacterial pneumonia still runs about 5%. This rate rises when the pneumonia is associated with debilitating processes such as alcoholism and AIDS. For these high-risk patients, consideration should be given to prophylaxis with polyvalent pneumococcal and influenza vaccinations (Table 19.2).

Viral Pneumonia

General supportive measures such as analgesics, antitussives, and antipyretics are appropriate. Amantadine (100 mg q 12 h) is effective for treating infections

with influenza A, but not against influenza B infections. Symptoms should resolve in several days to a week. It should be noted that amantadine should be used with caution in patients with liver disease or epilepsy, and in those with a history of psychotic illness.

Mycoplasma Pneumonia

Rest, fluids, and analgesics are appropriate initial therapy. Antibiotic treatment with either tetracycline or erythromycin (500 mg every 6 hours for 7 days) provides good coverage. Azithromycin, given as 500 mg the first day, then 250 mg for days 2 through 5, may also be effective. Antibiotics such as penicillin are not effective against *Mycoplasma pneumoniae*. Symptoms often take more than 2 weeks to resolve.

A false-positive VDRL may be found in patients with *Mycoplasma pneumonia*.

Pneumocystis carinii Pneumonia

Trimethoprim/sulfamethoxazole (10–20 mg/kg/day of trimethoprim component divided every 6 hours for 21 days) with adjunctive corticosteroid therapy (prednisone) is standard, though a high percentage of AIDS patients will develop intolerance to trimethoprim/sulfamethoxazole. Trimethoprim/sulfamethoxazole has been used in pregnancy for both treatment and prophylaxis.

Pneumocystis carinii pneumonia can be successfully treated in many cases. It may recur a few months later, but treatment can help to prevent or delay its recurrence. Mortality for first episode infections is now about 10–15%, down from as high as 30–40% previously. Approximately 10% of patients develop respiratory failure and more than 85% of these succumb.

Case Study

A 23-year-old G2P2002 patient calls your office complaining of a “sinus infection” and requesting that a prescription for antibiotics be called to a local pharmacy. She reports congestion, a nasal discharge that has become thick and purulent and she has had a low-grade fever. Her symptoms began about 5 days ago. How should you proceed at this point?

This is a typical presentation for the common cold—the symptoms, their progression and the request for antibiotic therapy are all typical. Unless there is a history of previous sinus infections, or a reason to suspect that this patient is at high risk for an atypical infection or complication (e.g., immunocompromise), an office visit, additional testing, or anything other than symptomatic interventions are not warranted.

Suggested Reading

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