



8 RESPIRATORY PRIMARY CARE

CORE CONCEPTS

- Recognize signs and symptoms related to common respiratory disorders.
- Assess patient history and make correlations relative to respiratory disorders.
- Initiate treatment for patients presenting with acute respiratory disorders.

INTRODUCTION

Respiratory system illnesses are common complaints among soldiers reporting to sick call. Combat medics must be able to recognize the signs and symptoms suggestive of respiratory disorders. Coughing, shortness of breath, and difficulty breathing are common symptoms. Therefore, you should have a basic knowledge of the anatomy and function of the respiratory system to enable treatment of common respiratory disorders within your scope of practice.

ANATOMY AND PHYSIOLOGY OF THE RESPIRATORY SYSTEM

The respiratory system is made up of several structures that allow us to take in oxygen, transfer it to the body, and release carbon dioxide through the process of breathing (Figure 8-1). The structure of the airway is divided into upper and lower regions. The upper airway consists of the nose, mouth, throat (pharynx), and epiglottis. The epiglottis is the leaf-like doorway that ends the upper airway and is mainly responsible for directing food and water away from the airways and into the digestive tract. The lower airway begins with the glottis (vocal cords) and ends with the alveoli, where oxygen is transferred to the circulatory system. Between these two structures are the trachea, bronchi, and bronchioles, which are tubes that channel air to the lungs. This system enables the body to exchange oxygen and carbon dioxide through a process called **diffusion** (Figure 8-2).

ASSESSING A PATIENT WITH A RESPIRATORY COMPLAINT

Assessment of patients with respiratory complaints follows the **SOAP** note format.

Subjective and Objective Information

When assessing a patient with respiratory complaints, gather the following subjective information:

- age, sex, and race;
- first day of last menstrual period (in females);
- chief complaint;
- history of present illness;
- **OPQRST**;
- past history; and
- **SAMPLE** history.

Document the following objective information:

- general impression;
- vital signs (blood pressure, temperature, pulse, respiratory rate, and pulse oximetry); and
- chest physical examination findings. Inspect and palpate both the anterior and posterior thorax for **DCAP-BTLS**. Note rate, rhythm, and effort of breathing. **Auscultate** breath sounds bilaterally.

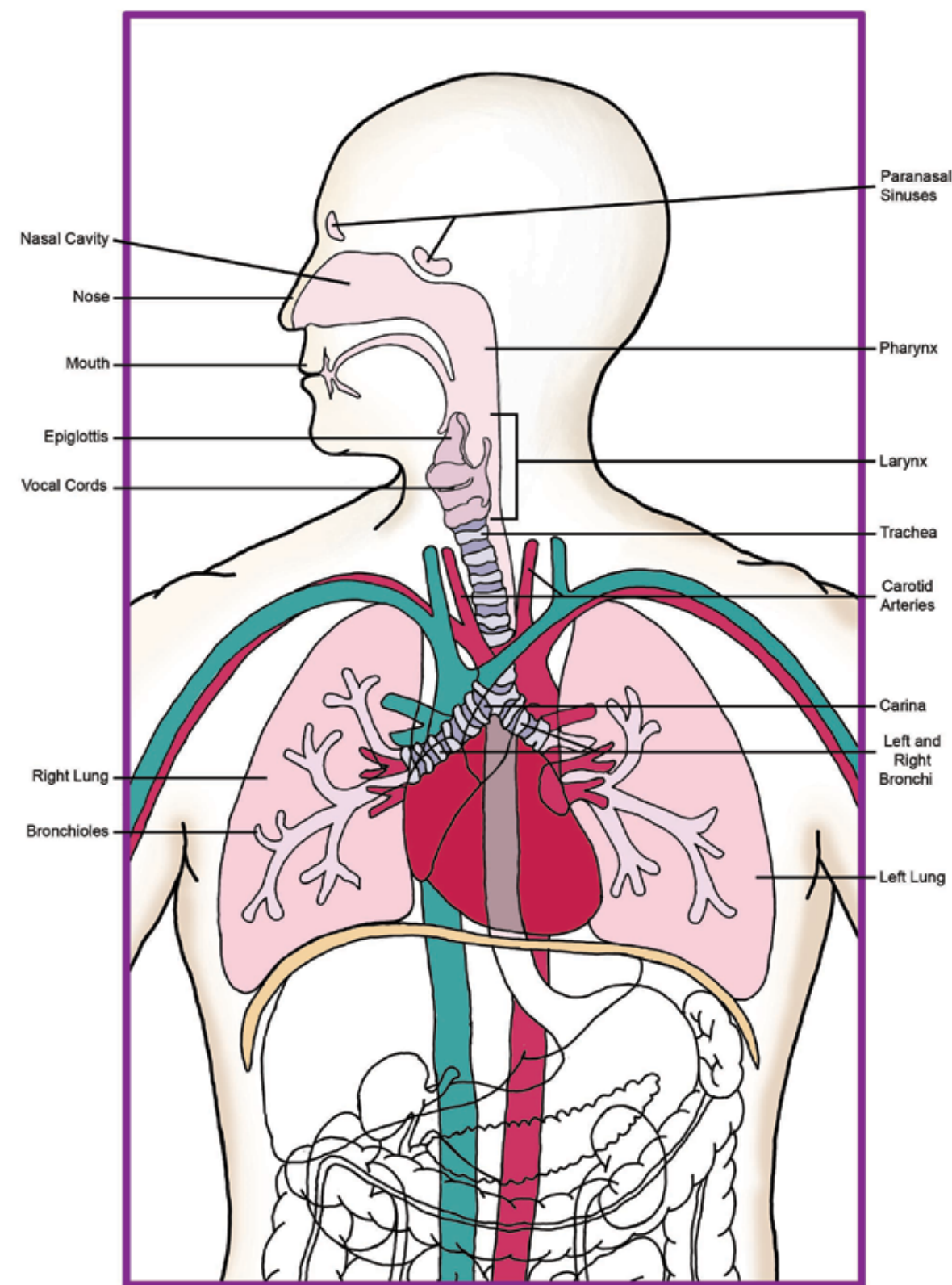


Figure 8-1. Anatomy of the upper and lower airway.

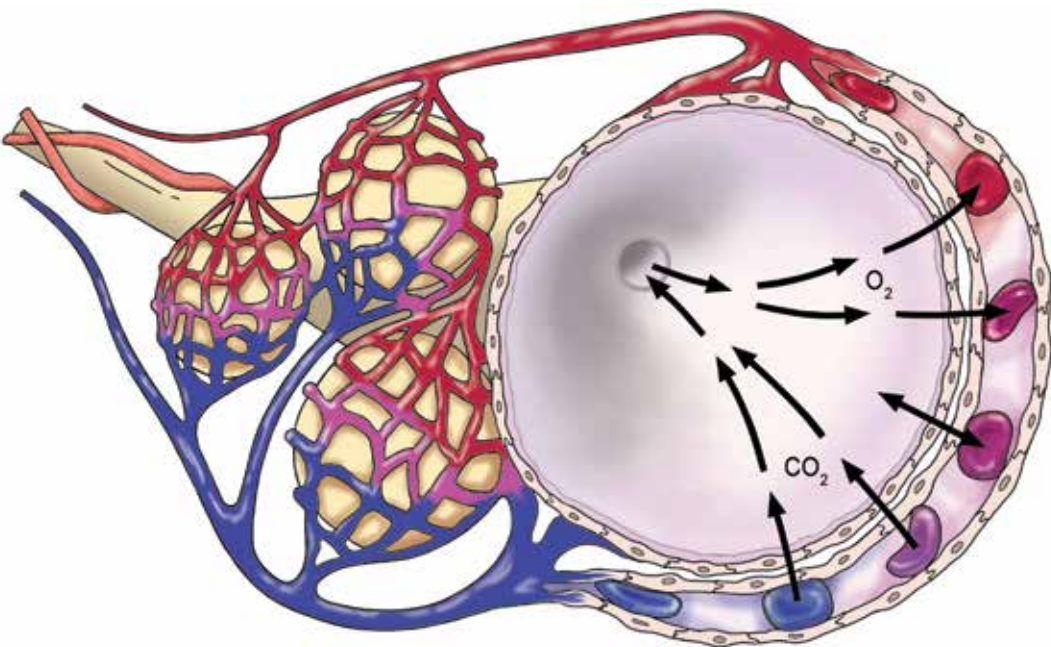


Figure 8-2. Oxygen diffuses across the alveolar membrane and binds to the hemoglobin of red blood cells, while carbon dioxide diffuses from the hemoglobin into the alveoli.

RED FLAGS of Respiratory Complaints

The following respiratory symptoms warrant immediate attention:

- fever higher than 100.4 °F,
- shortness of breath,
- abnormal breath sounds (**rhonchi**, **rales**, and **wheezing**),
- abnormal pulse oximetry (<95% oxygen saturation),
- **accessory muscle** use, and
- productive cough with chest pain.

Check on Learning

1. List the six RED FLAGS of respiratory complaints.

COMMON RESPIRATORY COMPLAINTS

Upper Respiratory Infection

An upper respiratory infection (URI) can be defined as an acute infection of the upper airway usually caused by viruses. URIs are typically afebrile with

inflammation in any or all areas including the nasal cavity, paranasal sinuses, throat, larynx, epiglottis, and most often the trachea and bronchi.

Although upper respiratory infections can occur at any time, they are most common during the fall and winter months. URIs are prevalent during this time because viruses that affect the upper respiratory tract thrive in the low humidity of the winter. Signs and symptoms may include the following:

- nasal congestion,
- sore throat,
- cough (productive or nonproductive),
- hoarseness,
- breathing difficulties,
- sinus pressure,
- **malaise**, and
- fatigue.

The pharynx may appear slightly reddened with mucous streaking. If the infection is contained in the upper respiratory tract, the lungs can be clear to auscultation.

In the military, upper respiratory infection (especially the common cold or influenza) is one of the most common reasons for sick call visits. Appropriate assessment is vital to identifying the illness and

returning the soldier to duty. The medical officer (MO) will discuss referral options and medical intervention goals you should consider while screening patients. Patients presenting with symptoms of a URI should be treated symptomatically with cough suppressants, decongestants, throat lozenges, **analgesics** for fever and body aches, increased fluids, and rest. The use of a face mask should be considered to prevent the spread of disease. Antibiotics are not indicated for viral URIs.

Common Cold and Influenza (Flu)

The flu and the common cold are both respiratory illnesses caused by different viruses (Figure 8-3). They are both highly contagious respiratory infections that can affect the soldier's ability to complete the mission. Most are seasonal and thrive in environments with relatively low humidity. People with a common cold or flu can spread it to others through droplets

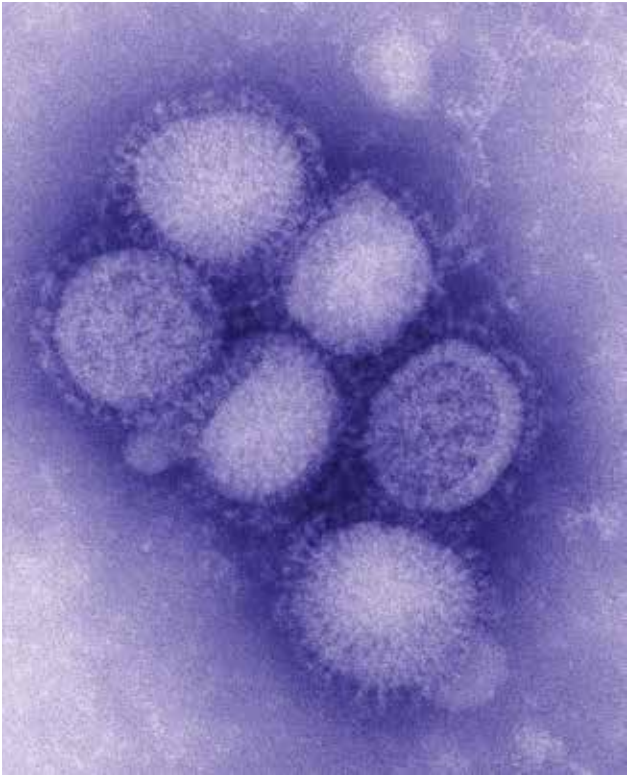


Figure 8-3. H1N1 Influenza virus. This virus is a subtype of type A influenza and has been responsible for several pandemics in history. Photograph by CDC/Dr. Lucille K. Georg. Reproduced from Public Health Image Library, Centers for Disease Control and Prevention. http://www.cdc.gov/h1n1flu/images.htm?s_cid=cs_001



Figure 8-4. A combat medic administers the influenza vaccine at the troop medical clinic at Contingency Operating Base Q-West. Photo by Sergeant Keith Anderson. Reproduced from Defense Visual Imagery Distribution System. <https://www.dvidshub.net/image/130163/medics-fast-with-hands-slow-with-minds>

deposited in the air from coughing, sneezing, or talking. The viruses can be acquired from inhalation or by touching the eyes, nose, or mouth after touching infected surfaces. The single most effective preventive measure to stop the spread of the common cold or flu is appropriate hand washing. All soldiers must be vaccinated against seasonal flu every year (Figure 8-4). However, vaccination may not completely protect the recipient and some circulating virus strains may not be included in the vaccine. Give face masks to all patients suspected of having the flu and refer them to the MO.

Signs and symptoms of the common cold and flu are similar, which makes it difficult to diagnose if you are focused on symptoms alone. Symptoms of the common cold can be as mild as having a runny or stuffy nose. In more severe cases, symptoms can include the following:

- sore throat,
- sneezing,
- slight fever,
- cough,
- fatigue,
- headache, and
- body ache.

When considering the possibility of the patient having the flu, it is important to remember that influenza patients experience a higher pain intensity. The most recognizable symptoms for the flu are extreme tiredness, fever, and nausea. A person infected with a

flu virus typically suffers from the illness for approximately 7 to 10 days. Treatment consists of 5 to 6 days of limited activity and about 3 days of bed rest. The common cold usually does not cause such debilitation.

Pneumonia

Pneumonia is inflammation of the lungs caused by a reaction to an invading pathogen or noxious substance (toxins or chemicals). It usually results in fluid consolidation, whereby fluid accumulates in surrounding lung tissue (Figure 8-5), separating the alveoli from the capillaries. When assessing a patient for pneumonia, always consider where and how the patient acquired the illness, as well as any other preexisting medical problems. Many different types of infectious agents cause pneumonia. Bacterial causes are common in young adults, whereas viruses are the common culprits in infants and young children (Figure 8-6).

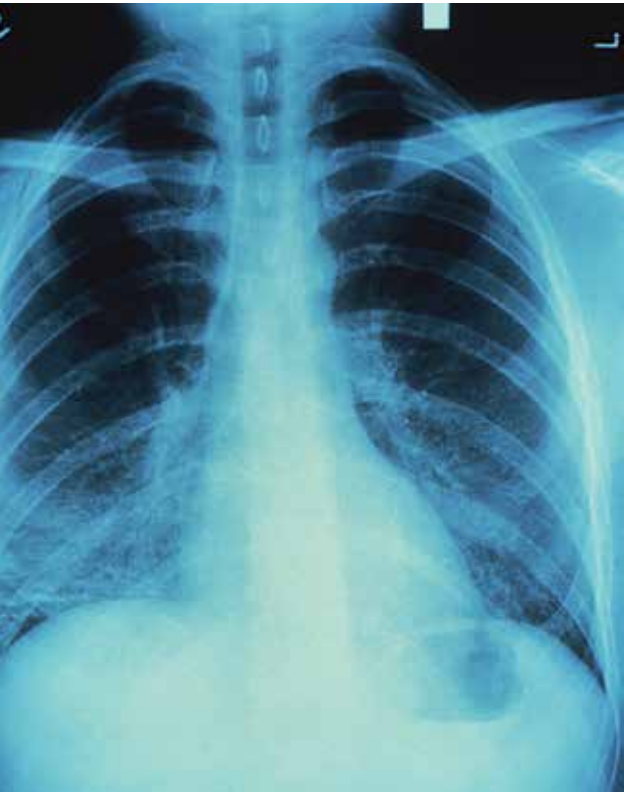


Figure 8-5. An anteroposterior (AP) chest x-ray showing bilateral pneumocystis (fungal) pneumonia. Photograph by CDC/Jonathan W.M. Gold, MD. Reproduced from Public Health Image Library, Centers for Disease Control and Prevention. <https://phil.cdc.gov/Details.aspx?pid=14372>

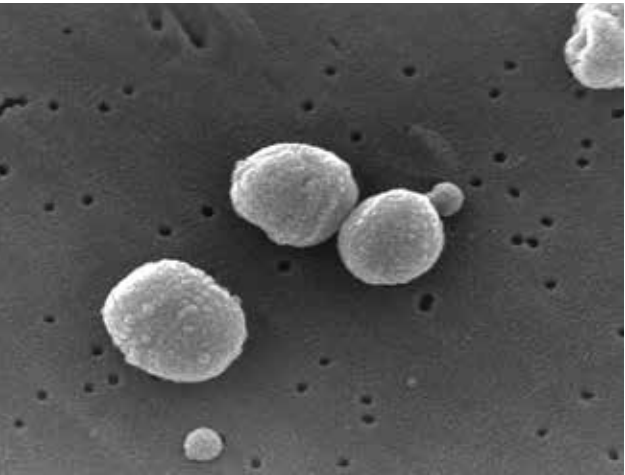


Figure 8-6. *Streptococcus pneumoniae* infections can cause serious illnesses such as pneumonia, bacterial meningitis, peritonitis, and endocarditis. Photograph by CDC/Janice Carr and Dr. Richard Facklam. Reproduced from Wikimedia Commons. https://commons.wikimedia.org/wiki/File:Streptococcus_pneumoniae.jpg

The following are signs and symptoms of pneumonia:

- cough (usually productive with green, brown, or rust-colored **purulent** sputum);
- chest pain;
- **pleurisy** (worse with cough or deep breath);
- shortness of breath at rest;
- malaise;
- lethargy;
- poor appetite;
- fever (occasionally with shaking chills);
- **tachycardia**;
- **tachypnea**; and
- rhonchi and rales (may be heard on auscultation).

If pneumonia is suspected, symptoms may be treated with nonsteroidal anti-inflammatory drugs (NSAIDs) or acetaminophen for fever, decongestants, cough suppressants (if cough results in trouble sleeping), and bronchodilators (eg, an albuterol inhaler). Patients should increase their fluid intake to avoid dehydration. Consider putting the patient on profile and bed rest. If in a field environment, patients with pneumonia should be evacuated to the nearest medical treatment facility. Patients with pneumonia usually require antibiotics; therefore, refer them to the MO for evaluation.

Note: Pneumonia is a leading medical cause of death in the United States.

Check On Learning

- 2. What are the signs and symptoms of pneumonia?
- 3. What is the single most effective way to stop the spread of colds and flu?
- 4. In obtaining a patient history, what are signs and symptoms indicating URI?

Asthma

Asthma is a disorder of the tracheobronchial tree characterized by mild to severe obstruction of airflow. It is caused by an exaggerated **bronchoconstriction** response to many different stimuli. Hyperactivity or hyper-responsiveness of the airway triggers the obstructive elements of asthma. The degree of hyper-responsiveness is closely linked to the extent of inflammation and severity of the disease. Precipitating factors may include the following:

- stress;
- physical exertion (usually beginning within 3 minutes after the end of exercise);
- cold weather;
- upper respiratory infection;
- allergens (eg, pollen, mold, house dust, animal dander, and cigarette smoke);
- certain drugs (eg, NSAIDs such as ibuprofen and aspirin); and
- other environmental agents such as outdoor pollutants.

Signs and symptoms may vary widely from mild to life-threatening. Acute symptoms are caused by spasm of the bronchial smooth muscle, narrowing of large and small airways, edema and inflammation of the bronchial mucosa, and excessive production of mucus. (Figure 8-7).

Note: The clinical hallmark of asthma is wheezing.

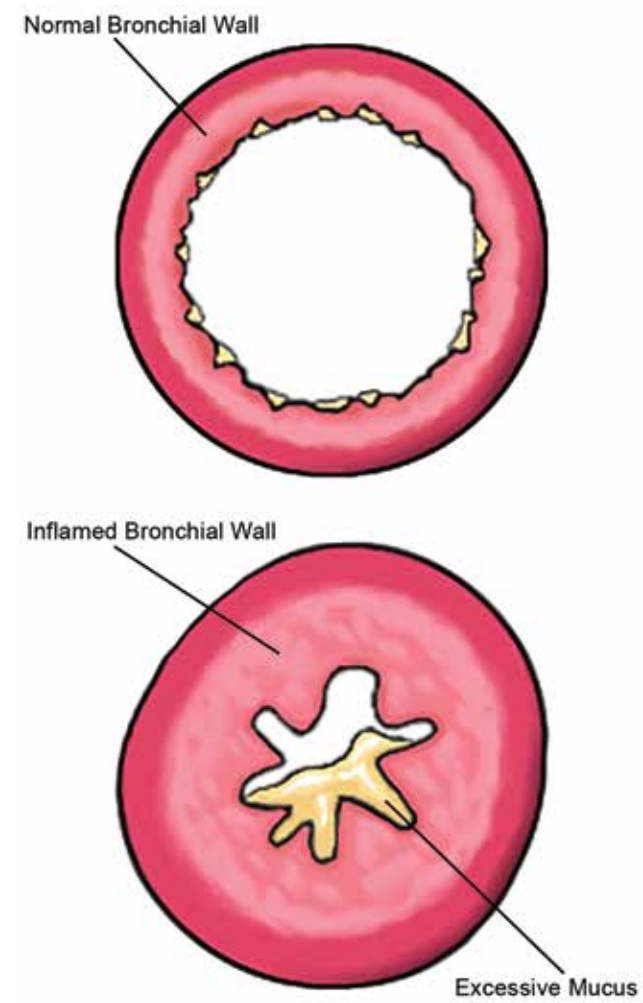


Figure 8-7. The pathophysiology of an asthma attack depicting the bronchoconstriction and mucous plugging that occurs when a patient experiences an asthma attack.

Symptoms include the following:

- prolonged expiratory phase,
- accessory muscle use with retractions,
- tachycardia, and
- decreased blood oxygenation (check with a pulse oximeter).

Signs and symptoms of asthma can be episodic, **paroxysmal**, or persistent.



Figure 8-8. An asthma patient receiving a nebulizer treatment of a bronchodilator medication. Photograph courtesy of Schertz Emergency Medical Services, Schertz, Texas.

The affected individual may have shortness of breath after exercise or upon awakening, a history of wheezing, chronic cough (usually nonproductive), nocturnal attacks, and chest tightness. Refer patients with these symptoms to the MO immediately.

Treatment for acute asthma attacks includes inhaled bronchodilators, such as a metered-dose inhaler or nebulizer (Figure 8-8), intravenous fluids, and supplemental oxygen. Patients in a field environment require immediate evacuation.

Check on Learning

- 5. What are five precipitating factors of asthma?

SUMMARY

Respiratory disorders are common and the ability to accurately assess and recognize them is crucial. In the field, identification of respiratory disorders can become even more significant due to possible environmental aggravations. Moreover, a combat medic who knows how to properly assess patient history plays a critical role in treating common symptoms and identifying RED FLAGS that may warrant immediate attention. Respiratory disorders can affect the mission; however, early diagnosis and treatment will reduce the amount of time soldiers are unable to perform their duties.

KEY TERMS AND ACRONYMS

- Accessory muscle.** One of several muscles that assist the primary muscles used in breathing by contributing to expansion and contraction of the thoracic cavity when needed. For example, you can often observe patients having an asthma attack using their abdominal muscles to help them move air.
- Analgesics.** Medications that provide pain relief.
- Auscultate.** Listening to sounds that originate from inside the body.
- Bronchoconstriction.** Constriction of the bronchial tubes.
- DCAP-BTLS.** Deformities, contusions, abrasions, punctures, burns, tenderness, lacerations, and swelling.
- Diffusion.** A passive process in which molecules move from an area of higher concentration to an area of lower concentration.
- Hyper-responsiveness.** Reacting quickly to a stimulus.
- Malaise.** A subjective sense of discomfort, weakness, fatigue, or feeling run down that may occur alone or accompany other symptoms and illnesses.
- NSAID.** Nonsteroidal anti-inflammatory drug.
- OPQRST.** Onset, provoking or palliative factors, quality, radiation or region, severity, and timing.
- Paroxysmal.** A sudden attack or recurrence.
- Pleurisy.** Inflammation of the pleura, with or without a liquid emission or discharge in the pleural cavity, characterized by a dry cough and pain in the affected side.
- Purulent.** Relating to or containing pus.
- Rales.** An abnormal crackling or rattling sound heard upon auscultation of the chest, caused by disease or congestion of the lungs.
- Rhonchi.** A wheezing or snoring noise heard upon auscultation of the chest, caused by an accumulation of mucus or other material.

SAMPLE. Signs and symptoms; allergies; medications; past medical, surgical, and social history; last oral intake; and events leading up to illness or injury.

SOAP. Subjective, objective, assessment, plan.

Tachycardia. Rapid heart rhythm, more than 100 beats per minute (bpm).

Tachypnea. Rapid respirations.

URI. Upper respiratory infection.

Wheezing. A rough, high-pitched breath sound that occurs when there is an airway obstruction.

CHECK ON LEARNING ANSWERS

1. List the six RED FLAGS of respiratory complaints.

Fever higher than 100.4 °F; shortness of breath, abnormal breath sounds (rhonchi, rales, severe wheezing), abnormal pulse oximetry (< 95% oxygen saturation), accessory muscle use, and productive cough with chest pain.

2. What are the signs and symptoms of pneumonia?

Cough, chest pain, pleurisy (worse with cough or deep breath), shortness of breath at rest, malaise, lethargy, poor appetite, fever (occasionally with shaking chills), and tachycardia.

3. What is the single most effective way to stop the spread of colds and flu?

Appropriate hand washing techniques.

4. In obtaining a patient history, what signs and symptoms indicate URI?

Nasal congestion, sore throat, cough, hoarseness, malaise, fatigue, and headache.

5. What are five precipitating factors of asthma?

Any five of the following: emotional upset, physical exertion, cold weather, upper respiratory infection, allergic components (eg, pollen, mold, house dust, animal dander, and cigarette smoke), certain drugs (eg, NSAIDs such as ibuprofen and aspirin), and other environmental agents such as outdoor pollutants.

SOURCES

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