Respiratory System

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Lesson Objectives

Upon completion of this lesson, students should be able to:

1. Define and spell the terms to learn for this chapter.
2. Explain the purpose and function of the respiratory system.
3. List and explain the structures and functions of the organs of the respiratory system.
Critical Thinking Question

1. How might you describe the breathing process to a patient?
Overview of the Respiratory System

- When we breathe we inhale oxygen and exhale carbon dioxide
- The mouth, nose, trachea, bronchi, bronchioles, and lungs constitute respiratory tract; pathway for respiration
Overview of the Respiratory System

- Oxygen enters respiratory system by inhalation
- Carbon dioxide exits system by exhalation
Overview of the Respiratory System

- Actions of inhalation and exhalation achieved by alternating contraction and relaxation of respiratory muscles
  - Diaphragm
  - Muscles attached to ribs (intercostal muscles)
  - Muscles of the neck
Structures of the respiratory system.
Organs of the Respiratory System

- Upper Respiratory Tract
  - Nose
  - Paranasal sinuses
  - Pharynx (throat)
Organs of the Respiratory System

- Lower Respiratory Tract
  - Larynx (voicebox)
  - Trachea (splits into two main branches called bronchi)
  - Tiny branches of bronchi called bronchioles
  - Lungs
Organs of the Respiratory System

• Nose
  • Organ of smell
  • Component of respiration and voice
  • Serves as passageway for air
  • Warms and moistens inhaled air
  • Traps dust, pollen, other foreign matter with hairlike projections (cilia)
  • Assists in the making of sounds for speaking and singing
Organs of the Respiratory System

- Nose External
  - Bone and cartilage
  - Lined with mucous membrane
  - Entrance nostrils (nares)
Organs of the Respiratory System

- Nose Internal
  - Septum
    - Wall of cartilage
    - Lined with mucous membrane
  - Each side of nose divided into three air passageways (conchae or turbinates)
    - Inferior conchae
    - Middle conchae
    - Superior conchae
Critical Thinking Question

1. Why does your nose run when you cry?
Organs of the Respiratory System

- Nose Internal
  - Passageways connect (via eustachian tube) to middle ear, to paranasal sinuses, to nasolacrimal ducts (tear ducts)
  - Nasal mucosae moistens air moving through nose and traps pollen, dust, foreign matter
  - Nose separated from mouth by palatine bones of skull
Organs of the Respiratory System

- Paranasal Sinuses
  - Maxillary sinuses over medial portion on the cheekbones
  - Frontal sinuses over eyebrows
  - Ethmoidal sinuses in area between and behind the eyes
  - Sphenoidal sinuses behind ethmoidal sinuses
The four pairs of paranasal sinuses.

- Frontal sinus
- Ethmoid sinus
- Maxillary sinus
- Sphenoid sinus
Organs of the Respiratory System

- Paranasal Sinuses
  - Decrease weight of skull by creating air pockets
  - Aid in phonation (production of vocal sounds)
  - Provide protection and insulation
Organs of the Respiratory System

• Pharynx
  • Tube about 5 inches long formed from muscle and membrane
  • Connects nose, mouth, and larynx
  • Passageway for food to esophagus and air to larynx and trachea
  • Helps to form specific phonetic sounds
Organs of the Respiratory System

• Pharynx
  • Pharyngeal tonsils (adenoids)
  • Palatine tonsils
  • Lingual tonsils
  • Tonsils part of immune system and help in infection control
Organs of the Respiratory System

• Larynx
  • Also known as voice box
  • Muscular, cartilaginous structure lined with mucous membrane
  • Cartilaginous structures
    • Thyroid cartilage
    • Epiglottic cartilage
    • Cricoid cartilage
1. Why would cartilage be a good material for protection?
Organs of the Respiratory System

• Larynx
  • Thyroid Cartilage
    • Known as Adam's apple
    • Largest of cartilage structures
  • Epiglottic Cartilage
    • Also called epiglottis
    • Covers larynx during swallowing so that food is directed down esophagus to the stomach
Organs of the Respiratory System

• Larynx
  • Cricoid Cartilage
    • Lowest cartilage in larynx
    • Allows for expansion to accommodate large boluses of food swallowed down esophagus
Organs of the Respiratory System

- Larynx
  - Contains false and true vocal folds and glottis
  - Functions in production of vocal sounds
    - Vocal cords long and relaxed, low sounds produced
    - Short, tense vocal cords produce higher-pitched notes
The larynx, trachea, bronchi, and lungs with an expanded view showing the structures of the alveolus and the pulmonary blood vessels.
Organs of the Respiratory System

• Trachea
  • Also known as windpipe
  • Cartilaginous tube about 1 inch wide and 4.5 inches long
  • Extends from larynx in the throat to bronchi in chest cavity
Organs of the Respiratory System

• Trachea
  • C-shaped rings of cartilage protect structure and shape of trachea
  • Serves as open passageway through which air reaches the lungs
Organs of the Respiratory System

• Bronchi
  • Two main branches (right and left bronchus) from trachea that extend into lungs
  • Passageways for air between trachea and the lungs
Organs of the Respiratory System

• Bronchi
  • After entering lungs, bronchi subdivide into the bronchial tree, which continues to branch into smaller and smaller branches
  • Bronchi that branch from secondary bronchi called tertiary bronchi
Organs of the Respiratory System

- Bronchioles
  - Smallest components of bronchial tree
  - Thin layer of epithelium and smooth muscle
  - Terminate at alveoli in the lungs
Organs of the Respiratory System

- Alveoli
  - Small air sacs that support network of capillaries where exchange of oxygen and carbon dioxide takes place
  - Average adult's lungs contain about 600 million alveoli
  - Surfactant reduces surface tension of the fluid in the wet surfaces of the air-filled sacs
(A) Alveolar sac; (B) alveoli with capillaries.
Organs of the Respiratory System

- Lungs
  - Large, somewhat cone-shaped organs in chest
  - Porous and spongy in texture; highly elastic
  - Each lung 10 and 12 inches in length
  - Two lungs separated by mediastinum (space that contains heart, trachea, esophagus, and blood vessels)
Organs of the Respiratory System

• Lungs
  • Hilum
    • Wedge-shaped area on central portion of each lung where primary bronchus, arteries, veins, and nerves enter and exit lung
  • Pleura
    • Thin sheets of epithelium; covers outside of lungs and inside of thoracic cavity
Critical Thinking Question

1. Why is the outside lining of the lungs lubricated?
Critical Thinking Question

1. Why do you think a person's immunity is affected when cells of the lungs are damaged or destroyed by illness or smoking?
The process of ventilation: inspiration and expiration.

(a) Inspiration
- Rib cage moves up and out.
- External intercostal muscles
- Diaphragm contracts and moves down.
- Pressure in lungs decreases, and air comes rushing in.

(b) Expiration
- Rib cage moves down and in.
- Internal intercostal muscles
- Diaphragm relaxes and moves up.
- Pressure in lungs increases, and air is pushed out.
Mechanism of Breathing

• Ventilation
  • Movement of air to and from the lungs

• Two Processes of Ventilation
  • Inhalation and exhalation
  • Brought about by nervous system and respiratory muscles
Mechanism of Breathing

- Major Respiratory Muscles
  - Diaphragm
  - Internal and external intercostal muscles
Mechanism of Breathing

• Diaphragm
  • Dome-shaped muscle below lungs that separates thoracic cavity from abdominal cavity
Mechanism of Breathing

- Intercostal muscles located between ribs
  - External intercostal muscles pull ribs upward and outward
  - Internal intercostal muscles pull ribs downward and inward
Mechanism of Breathing

- Dyspnea
  - Difficulty breathing
- Apnea
  - Absence of breathing for more than 19 seconds
- Orthopnea
  - Patient has trouble breathing unless a certain position is maintained
Mechanism of Breathing

- Inhalation
  - Also known as inspiration
  - Active process that involves precise sequence of events
  - Nervous system sends impulse to diaphragm and external intercostal muscles
  - Diaphragm contracts and flattens
  - Results in elongation of thorax
Mechanism of Breathing

• Inhalation
  • At the same time, external intercostal muscles contract to pull ribs upward and outward
  • This increases size of thorax from front to back and side to side
Mechanism of Breathing

• Inhalation
  • Increase in size of chest cavity reduces pressure within chest
  • Environmental air (now under greater pressure) flows into lungs
Mechanism of Breathing

- Exhalation
  - Also known as quiet exhalation or expiration
  - Ordinarily passive process
  - Diaphragm and intercostal muscles relax and thorax returns to its resting size and shape
Mechanism of Breathing

- Exhalation
  - Reduction in size of thoracic cavity builds pressure inside chest cavity until it is greater than environmental air pressure
  - Causes air to flow out of lungs
Mechanism of Breathing

• Exhalation
  • Elastic recoil of lung tissues aids in quiet expiration
  • Forceful expiration involves internal intercostals and abdominal muscles
Common Disorders Associated with the Respiratory System

• Hypoxia is a lack of oxygen in the body and can be serious.
• It can lead to asphyxia, or suffocation.
• Arterial blood gases (ABGs) drawn by taking blood out of the arteries.
  • Processed immediately to truly ascertain level of oxygen and carbon dioxide (CO₂) in blood
Common Disorders Associated with the Respiratory System

• Asthma
  • Chronic, inflammatory disease of the bronchi
  • May be related to allergic reactions
  • Irritations causes swelling
  • Affects trachea and/or bronchial tubes
Common Disorders Associated with the Respiratory System

• Asthma
  • Results in coughing, which adds to irritation
  • Common irritants: pet dander, cigarette smoke, pollen, other substances
Common Disorders Associated with the Respiratory System

- Asthma
  - Difficulty breathing (dyspnea)
  - Cough
  - Wheezing and tightness in chest
  - Bronchodilators treatment of choice
Common Disorders Associated with the Respiratory System

• Asthma
  • Medications
    • Long-acting beta-2 medications
    • Eicosanoid lipid mediators
    • Inhaled corticosteroids
    • Steroids
Common Disorders Associated with the Respiratory System

- Chronic Obstructive Pulmonary Disease (COPD)
  - Combination of related diseases—chronic bronchitis and emphysema
  - Chronic obstruction of flow of air through airways and out of lungs
Common Disorders Associated with the Respiratory System

• Chronic Obstructive Pulmonary Disease (COPD)
  • Obstruction generally permanent and progresses over time
  • Smoking responsible for 85 to 90 percent of cases
Common Disorders Associated with the Respiratory System

- Chronic Obstructive Pulmonary Disease (COPD)
  - Diagnosis
    - Medical history and testing
    - Shortness of breath and difficulty breathing
    - Increased number of respiratory infections
Common Disorders Associated with the Respiratory System

- Chronic Obstructive Pulmonary Disease (COPD)
  - Persistent cough that may or may not produce mucus
  - Fatigue
  - Inability to catch one's breath
Common Disorders Associated with the Respiratory System

• Chronic Obstructive Pulmonary Disease (COPD)
  • Treatment
    • Prevent further deterioration in lung function
    • Alleviate symptoms
    • Smoking cessation
    • Bronchodilators
Common Disorders Associated with the Respiratory System

- Chronic Obstructive Pulmonary Disease (COPD)
  - Treatment
    - Vaccination against influenza and pneumonia
    - Regular oxygen supplementation
    - Pulmonary rehabilitation
Common Disorders Associated with the Respiratory System

• Bronchitis
  • Respiratory disease in which mucous membrane in bronchial passages becomes inflamed
  • As the irritated membrane swells and grows thicker, it narrows airways in the lungs
Common Disorders Associated with the Respiratory System

• Bronchitis
  • Occurs in two forms:
    • Acute
      • Lasting less than six weeks
    • Chronic
      • Recurring frequently for more than two years; considered to be a form of COPD
Common Disorders Associated with the Respiratory System

- Acute Bronchitis
  - Hacking cough
  - Yellow, white, or green phlegm, usually appearing 24 to 48 hours after cough begins
  - Fever and chills
Common Disorders Associated with the Respiratory System

- Acute Bronchitis
  - Soreness and tightness in chest
  - Pain below breastbone during deep breathing
  - Shortness of breath
Common Disorders Associated with the Respiratory System

• Chronic Bronchitis
  • Persistent cough
  • Produces yellow, white, or green phlegm (for at least three months of the year and for more than two consecutive years)
  • Sometimes wheezing and breathlessness
Common Disorders Associated with the Respiratory System

- **Acute Bronchitis Treatment**
  - Plenty of rest
  - Drinking lots of fluids
  - Avoiding smoke and fumes
  - Use of inhaled bronchodilator
  - Cough suppressant

- **Chronic Bronchitis Treatment**
  - Inhaled or oral steroids
  - Supplemental oxygen may be necessary
Common Disorders Associated with the Respiratory System

• Emphysema
  • Long-term, progressive lung disease
  • Attacks structure of alveoli in lungs
  • Permanent holes develop in alveolar walls, making them unable to hold their shape properly on exhalation
  • Decreases amount of oxygen-rich blood that is able to circulate through the body
Common Disorders Associated with the Respiratory System

• Emphysema
  • Tobacco smoking most common cause
  • Deficiency of enzyme alpha-1 antitrypsin
  • Air pollution
  • Airway reactivity
  • Heredity
  • Gender (male)
  • Age
Common Disorders Associated with the Respiratory System

- Emphysema
  - Shortness of breath most common symptom
  - Coughing, sometimes caused by production of mucus
  - Wheezing
  - Rapid heartbeat
  - Decreased cognition
  - Intolerance for exercise
Common Disorders Associated with the Respiratory System

- Emphysema
  - Smoking cessation
  - Bronchodilating medications
  - Steroids and antibiotics
  - If patient experiences shortness of breath, oxygen therapy may be given
  - In very severe cases, surgery to remove a lung may be required
Common Disorders Associated with the Respiratory System

- Common Cold
  - Viral infection of upper respiratory tract
  - Caused by more than 200 viruses
  - Rhinovirus most common virus
  - Many cold viruses highly contagious; transmitted through droplets
  - Transmitted through sneezing and coughing, hand-to-hand contact, use of shared objects
Common Disorders Associated with the Respiratory System

- Common Cold
  - Runny or stuffy nose or sneezing
  - Itchy or sore throat
  - Cough
  - Congestion
  - Slight body aches
Common Disorders Associated with the Respiratory System

- Common Cold
  - Mild headache
  - Watery eyes
  - Low-grade fever of less than 102°F
  - Mild fatigue
Common Disorders Associated with the Respiratory System

- Common Cold
  - No cure
  - Antibiotics useless against cold viruses
  - OTC cold preparations do not cure or shorten its duration
Common Disorders Associated with the Respiratory System

- Common Cold
  - OTC medications can relieve some symptoms
    - Fever, sore throat, headache: mild pain relievers
    - Runny nose and nasal congestion: antihistamines or decongestants
Common Disorders Associated with the Respiratory System

- Common Cold
  - No effective vaccine developed
  - Wash hands
  - Scrub countertops clean, especially when someone in household has a cold
Common Disorders Associated with the Respiratory System

- Common Cold
  - Use tissues to sneeze and cough into and discard them immediately
  - Not sharing drinking glasses or other utensils with family members who may be sick
Common Disorders Associated with the Respiratory System

- Hay Fever
  - Also called seasonal allergic rhinitis or pollinosis
  - Seasonal allergy
  - Mucous membranes of nose and eyes become inflamed
Common Disorders Associated with the Respiratory System

• Hay Fever
  • Cause
    • Pollen of trees, plants, weeds carried by wind and air
  • About 26 million Americans experience hay fever symptoms each year
Common Disorders Associated with the Respiratory System

• Hay Fever
  • Repeated and prolonged sneezing
  • Stuffy and watery nose
  • Redness, swelling, itching of eyes
  • Itching of nose, throat, mouth, ears
  • Other ear problems
  • Impaired senses of smell and taste
  • At bedtime, may experience difficulty breathing and increased coughing
Common Disorders Associated with the Respiratory System

• Hay Fever
  • Best controlled by avoiding substance that causes the reaction
  • Air filters
  • Antihistamine medication
  • Corticosteroids
Common Disorders Associated with the Respiratory System

- Influenza
  - Commonly called the flu
  - Caused by viruses that infect respiratory tract
  - Often more serious than common cold
Common Disorders Associated with the Respiratory System

- Influenza
  - Symptoms begin and progress more quickly with influenza
  - Influenza viruses continually change over time, usually by mutation
  - Body susceptible to new mutations
1. Are antibiotics an effective treatment for the flu? Why or why not?
Common Disorders Associated with the Respiratory System

- Influenza
  - Fever (usually 102°F to 106°F in adults, often higher in children)
  - Dry cough
  - Sore throat
  - Runny or stuffy nose
Common Disorders Associated with the Respiratory System

- Influenza
  - Headache
  - Muscle aches
  - Extreme fatigue
  - Gastrointestinal symptoms rarely prominent
Common Disorders Associated with the Respiratory System

• Influenza
  • Most people recover completely in one to two weeks
  • Some develop serious and potentially life-threatening medical complications
Common Disorders Associated with the Respiratory System

• Influenza
  • Best defense against influenza is annual influenza vaccination
  • Health care workers, elderly, those who are immunosuppressed, children at highest risk
Common Disorders Associated with the Respiratory System

- Legionnaire's Disease
  - Type of pneumonia or lung infection
  - Caused by breathing in a mist of water contaminated with Legionella bacterium
  - Known as Legionnaires' disease (legionellosis) in 1976 after attendees at American Legion convention became ill in a Philadelphia hotel
  - 40 different strains since identified
Common Disorders Associated with the Respiratory System

• Legionnaire's Disease
  • Affects middle-aged or elderly people and smokers or people with respiratory problems
  • Not transmitted via person-to-person contact
Common Disorders Associated with the Respiratory System

• Legionnaire's Disease
  • Direct exposure to bacteria
  • Symptoms 2 to 14 days after person infected
    • High fever with sweating
    • Severe headache
    • Shortness of breath and cough
    • Muscle aches and pains
Common Disorders Associated with the Respiratory System

• Legionnaire's Disease
  • Severe cases
    • Body systems affected leading to diarrhea, vomiting, mental confusion, kidney and liver damage
Common Disorders Associated with the Respiratory System

- Legionnaire's Disease
  - Treatment
    - Administration of antibiotics
    - Severe cases, oxygen therapy necessary
    - Fluid and electrolyte replacement
  - In United States, *Legionella* considered reportable health condition
Common Disorders Associated with the Respiratory System

• Lung Cancer
  • Leading cause of cancer deaths in both women and men in U.S. and throughout world
  • 85 percent of cases occur in smokers or former smokers
Common Disorders Associated with the Respiratory System

• Lung Cancer
  • Risk of developing related to:
    • Number of cigarettes smoked
    • Age person started smoking
    • How long person has smoked
Common Disorders Associated with the Respiratory System

• Lung Cancer
  • 3,000 nonsmokers die each year from secondhand smoke
  • High-risk causes include:
    • Exposure to asbestos and radon gas
    • Excessive levels of air pollution
    • Arsenic in drinking water
    • Exposure to certain carcinogens
An X-ray image of lung cancer.
Science Photo Library - NATIONAL CANCER INSTITUTE/Getty Images;
Common Disorders Associated with the Respiratory System

- Lung Cancer
  - Two types
    - Non-small cell lung cancer (NSCLC) and small cell lung cancer
  - Small cell less common, faster-growing, and spreads more quickly
Common Disorders Associated with the Respiratory System

• Lung Cancer
  • Persistent cough
  • Coughing up blood
  • Shortness of breath
  • Wheezing
  • Chest pain
  • Excessive fatigue
  • Decreased appetite and weight loss
Common Disorders Associated with the Respiratory System

- Lung Cancer
  - Treatment depends on type and stage of lung cancer diagnosis
    - Surgery
    - Chemotherapy
    - Radiation therapy
Common Disorders Associated with the Respiratory System

- Pertussis
  - Also known as whooping cough
  - There is an effective vaccination
  - Bacterial infection of upper respiratory tract
Common Disorders Associated with the Respiratory System

• Pertussis
  • Caused by *Bordetella pertussis*
  • Highly contagious bacterium spread through airborne droplets
  • Intense and uncontrollable coughing spells
Common Disorders Associated with the Respiratory System

• Pertussis
  • Infants afflicted with disease may have permanent disability, and it could be fatal
  • Mimics common cold symptoms: coughing, runny nose, low-grade fever
  • Within two weeks of infection, violent coughing develops that ends in a noise that sounds like a "whoop"
Common Disorders Associated with the Respiratory System

• Pertussis
  • Antibiotics if pertussis diagnosed early
  • At the hospital, oxygen therapy, including oxygen tents with high levels of humidity, IV fluids, and sedatives may be administered to relieve symptoms
Common Disorders Associated with the Respiratory System

• Pleurisy
  • Also known as pleuritis
  • Inflammation of membrane that surrounds and protects lungs (the pleura) caused by:
    • Lower respiratory infections (viruses or bacteria)
    • Injury to chest
Common Disorders Associated with the Respiratory System

• Pleurisy
  • Inflammation of membrane that surrounds and protects lungs (the pleura) caused by:
    • Pulmonary embolism
    • Disorders (rheumatoid arthritis, lupus, pancreatitis)
    • Complications from heart surgery
Common Disorders Associated with the Respiratory System

• Pleurisy
  • Sudden, intense chest pain
  • Pain may be constant; usually most severe with inhalation
  • Referred pain
  • Holding one's breath or exerting pressure against chest relieves the pain
  • Rapid, shallow breathing pattern
  • Cyanosis of patient's lips or nail beds
Common Disorders Associated with the Respiratory System

• Pleurisy
  • Analgesic and antiinflammatory drugs
  • Relief obtained by lying on painful side
  • Painful cough controlled with codeine-based cough syrups
  • Patient should try to breathe deeply and clear any congestion by coughing
Critical Thinking Question

1. Why is coughing to clear congestion recommended after pain subsides?
Common Disorders Associated with the Respiratory System

- Pneumonia
  - Inflammation of the lung or lungs caused by bacteria, viruses, fungi, or chemical irritants
  - *Streptococcus pneumoniae* (pneumococcus) most common bacteria
Common Disorders Associated with the Respiratory System

• Pneumonia
  • Influenza virus most common viral cause
  • Young children, elderly, those with weakened immune systems, patients with respiratory disorders more susceptible
Common Disorders Associated with the Respiratory System

- Pneumonia
  - Productive cough with greenish mucus or puslike sputum
  - Fever
  - Chills
  - Fatigue
  - Chest pain
  - Muscle aches
Common Disorders Associated with the Respiratory System

• Pneumonia
  • Treated with fluids, rest, antibiotics, and nonprescription drugs for pain relief
  • Oxygen therapy and respiratory treatments
  • Cough medicines may be counterproductive
Common Disorders Associated with the Respiratory System

- Pulmonary Edema
  - Fluid accumulates in the alveoli of lungs
  - Can be chronic condition
  - Can develop suddenly and quickly become life-threatening
  - Most cases caused by failure of the heart's main chamber, the left ventricle, to pump adequately
Common Disorders Associated with the Respiratory System

• Pulmonary Edema
  • Shortness of breath brought on by exertion
  • Difficulty breathing in positions other than sitting upright
  • Frothy bloody sputum containing pus
Common Disorders Associated with the Respiratory System

- Pulmonary Edema
  - Cold, clammy, cyanotic skin
  - Leg swelling
  - Decreased alertness
  - Increased anxiety
Common Disorders Associated with the Respiratory System

- Pulmonary Edema
  - Requires immediate emergency treatment in hospital setting
  - Oxygen therapy administered to increase oxygenated blood circulation throughout body
  - Diuretic medications
  - Goal of treatment is to reduce amount of fluid in the lungs
Common Disorders Associated with the Respiratory System

• Pulmonary Embolism
  • Blood in the lungs
  • Usually comes from vessels in leg, pelvis, arm, or heart
  • Vessels of lungs become smaller and smaller
  • Wedged clot prevents blood flow
  • Deprived of oxygen, that portion of lung suffers an infarct
Pulmonary embolism. The purple shaded section shows the area of the lung that is dying from lack of blood supply caused by the embolism.
Common Disorders Associated with the Respiratory System

• Pulmonary Embolism
  • Risks of clot formation
    • Person immobilized because of illness, injury, or prolonged sitting
    • Recent surgery
    • Trauma or injury (especially to legs)
    • Obesity
Common Disorders Associated with the Respiratory System

• Pulmonary Embolism
  • Risks of clot formation
    • Heart disease
    • Burns
    • Previous history of blood clots in the legs
Common Disorders Associated with the Respiratory System

- Pulmonary Embolism
  - Sudden onset of chest pain that is sharp and stabbing and worse when taking deep breath
  - Shortness of breath
  - Rapid breathing and rapid heart rate
Common Disorders Associated with the Respiratory System

• Pulmonary Embolism
  • Anxiety or apprehension
  • Dry cough
  • Sweating
  • Passing out
Common Disorders Associated with the Respiratory System

- Pulmonary Embolism
  - Thrombolytics
    - Clot-buster medications used to help dissolve emboli
  - Oxygen therapy
    - Initiated to assist with breathing
Common Disorders Associated with the Respiratory System

- Pulmonary Embolism
  - Blood-thinning medications
    - Administered to prevent formation of new clots
  - Medications to raise blood pressure levels may also be necessary
Critical Thinking Questions

1. In addition to the lungs, where else can a blood clot become lodged?
2. What is the resulting problem?
Common Disorders Associated with the Respiratory System

• Severe Acute Respiratory Syndrome (SARS)
  • Recently identified respiratory illness
  • First infected people in parts of Asia, North America, and Europe in early 2003
Common Disorders Associated with the Respiratory System

- Severe Acute Respiratory Syndrome (SARS)
  - New virus known as SARS-CoV
  - May have first developed in animals
  - Highly contagious illness spread via airborne droplets
Common Disorders Associated with the Respiratory System

• Severe Acute Respiratory Syndrome (SARS)
  • Cough
  • Difficulty breathing
  • Fevers greater than 100.4°F
  • Muscle aches
  • Headaches
  • Chills
Common Disorders Associated with the Respiratory System

- Severe Acute Respiratory Syndrome (SARS)
  - Antibiotics
  - High doses of steroids to reduce inflammation of lungs
  - Antiviral medications
Common Disorders Associated with the Respiratory System

- Sinusitis
  - Infection or inflammation of mucous membranes that line nose and sinus cavities
  - Swells, blocking drainage of fluid from sinuses into nose and throat
Common Disorders Associated with the Respiratory System

• Sinusitis
  • Causes pressure and pain in sinuses
  • Sinuses that do not drain properly more vulnerable to bacterial and fungal growth
Common Disorders Associated with the Respiratory System

- Sinusitis
  - Types include acute (sudden) and chronic (long term)
  - Pain and pressure in face
  - Stuffy or runny nose
  - Sore throat
  - Postnasal drip
Common Disorders Associated with the Respiratory System

• Sinusitis
  • Cough that worsens at night
  • Bad breath
  • Tooth pain
  • Decreased sense of smell
Common Disorders Associated with the Respiratory System

• Sinusitis
  • Medications
    • Combination of antibiotics, decongestants, analgesics, corticosteroids, mucolytics
  • Applying moist heat to face
  • Increasing fluid intake
  • Using humidifier
Common Disorders Associated with the Respiratory System

- Tuberculosis (TB)
  - Contagious and caused by *Mycobacterium tuberculosis* bacteria
  - Spread when infected droplets inhaled
  - Expel droplets through laughing, coughing, sneezing, and spitting
  - TB bacteria most commonly found in lungs, where they produce granulomas (granular tumors)
Common Disorders Associated with the Respiratory System

- Tuberculosis (TB)
  - Coughing
  - Hemoptysis
  - Night sweats
  - Fatigue
Common Disorders Associated with the Respiratory System

• Tuberculosis (TB)
  • Chills
  • Weakness
  • Anorexia
  • Advanced TB
    • Clubbing of fingers and toes
Common Disorders Associated with the Respiratory System

• Tuberculosis (TB)
  • Treatment long term as it usually takes 9 to 12 months to eradicate the bacteria
  • Respiratory precautions
Common Disorders Associated with the Respiratory System

• Tuberculosis (TB)
  • Four antibiotics taken at same time:
    • Rifampin
    • Isoniazid
    • Pyrazinamide
    • Ethambutol