LESSON ASSIGNMENT

LESSON 3
Infectious Respiratory Diseases.

LESSON ASSIGNMENT
Paragraphs 3-1 through 3-15.

LESSON OBJECTIVES
After completing this lesson, you should be able to:

3-1. Identify the characteristics, signs/symptoms, and treatment for these upper respiratory diseases: allergic rhinitis; paranasal sinusitis; common cold; acute pharyngitis; acute tonsillitis/strep throat.

3-2. Identify the characteristics, signs/symptoms, and treatment for these upper respiratory diseases with systemic effects: mononucleosis; influenza.

3-3. Identify the characteristics, signs/symptoms, and treatment for these types of pneumonia: staphylococcal pneumonia; mycoplasmal pneumonia; viral pneumonia; bronchial pneumonia.

SUGGESTION
After completing the assignment, complete the exercises at the end of this lesson. These exercises will help you to achieve the lesson objectives.
LESSON 3
INFECTIOUS RESPIRATORY DISEASES

Section I. UPPER RESPIRATORY DISEASES

3-1. ALLERGIC RHINITIS

a. Definition/Characteristics. Allergic rhinitis may be defined as the inflammation of nasal mucosa brought about by airborne pollens that react to release histamine. In other words, when some people breathe pollens that are in the air, the pollens cause histamine to be released. The excess of histamine in the body causes nasal mucosa to become inflamed. Causes of allergic rhinitis, more common during the warmest months of the year, include hay fever and allergic disorders which are common during seasons when the pollen count is high. Allergic rhinitis is also caused by house dust, occupational dust, molds, and animal danders (feathers, wool in blankets). Certain foods and drugs cause allergic rhinitis symptoms; sometimes bacteria cause this problem.

b. Signs/Symptoms.

(1) Nasal congestion.
(2) Profuse watery discharge.
(3) Itching of nose and conjunctiva.
(4) Sneezing.

c. Treatment. Treatment may include a combination of antihistamines, decongestants, or desensitization as well as management. Elimination of house dust, pollens, and such may bring relief to the patient's symptoms.

(1) Antihistamines. For the majority of patients, antihistamines will not only control the symptoms of allergic rhinitis but also dry out the membranes. Caution: Antihistamines cause some persons to be sedated, depressed, sleepy, or uncoordinated. Watch for these reactions.

(2) Decongestants. Give decongestants if the patient suffers from nasal obstruction. Decongestants are effective for short-term but not long-term treatment.

(3) Desensitization. Several months before the season when the individual becomes acutely uncomfortable from pollen, give injections of pollen extracts that are specifically made for the individual. Continue giving the injections once a week during the peak of the pollen season.
3-2. PARANASAL SINUSITIS

a. Definition/Characteristics. Paranasal sinusitis is an infection of the mucous membranes that line the paranasal sinuses. Since the membrane that lines these sinuses is continuous with that of the nose and throat, paranasal sinusitis is a common complication of any upper respiratory infection. Causes of paranasal sinusitis include viruses, streptococci, and pneumococci.

b. Signs/Symptoms. Signs and symptoms of acute paranasal sinusitis are like those of acute rhinitis but are more severe. Included are headache, worse during the day; facial and tooth pain; tenderness over the sinuses; and fever and chills. There may be chronic recurrences of these signs and symptoms along with postnasal drip.

c. Treatment. The goals of treatment are to improve drainage and control infection. Vasoconstrictors such as steam inhalation and phenylephrine 0.25 percent spray used three times a day for a maximum of seven days may be used to open the nasal passages. In the case of acute paranasal sinusitis, antibiotics may be given. The drug of choice is penicillin G. If the patient is allergic to penicillin, erythromycin is an alternative drug. Patients suffering from chronic paranasal sinusitis may be given ampicillin or tetracycline.

d. Complications. Possible complications from paranasal sinusitis include osteomyelitis (inflammation of the bone marrow); meningitis (inflammation of the membranes covering the brain and spinal cord); and abscess.

3-3. COMMON COLD

a. Definition/Characteristics. The common cold is a contagious, viral infection of the upper respiratory tract. The cold is usually caused by a strain of rhinovirus. Over ninety distinct strains of rhinovirus are known to cause the common cold. Although not everyone is susceptible to infection from a cold virus, this respiratory infection occurs more often than all other diseases combined. Whether or not a person develops a cold after being exposed to a cold virus is determined to some extent by the person's general health. Fatigue, chilling of the body, wearing wet clothes and shoes, and the presence of irritating substances in the air make it more likely that the person will develop a cold.

b. Signs/Symptoms. These are signs and symptoms of the common cold:

(1) Malaise (general feeling of being unwell).
(2) Fever/chills.
(3) Headache.
(4) Nasal discomfort.
(5) Dry, sore throat.

(6) Cough (either productive or nonproductive).

(7) Mild leukocytosis (temporary increase in number of leukocytes in the blood).

c. **Treatment.** The patient should rest, drink fluids, take analgesics for pain, and use nasal decongestants for stuffiness in the nasal passages.

**3-4. ACUTE PHARYNGITIS**

a. **Definition/Characteristics.** Acute pharyngitis is an inflammation of the pharynx. This disease, inflammation of the mucosa of the pharynx, usually occurs as part of an upper respiratory tract disorder. The nose, sinuses, larynx, and trachea may also be affected. The most common causes are bacterial and viral infection. Very rarely, acute pharyngitis is caused by inhalation of irritant gases or ingestion of irritant liquids. Sometimes, acute pharyngitis is one symptom of a specific disease such as measles, chickenpox, scarlet fever, or whooping cough.

b. **Signs/Symptoms.** Common signs and symptoms are listed below. A complication may be a secondary infection.

   (1) Dry and sore throat.

   (2) Fever.

   (3) Malaise.

   (4) Strep infection may be present with white pus pocket formation.

   (5) Cough.

c. **Treatment.** Rest, light diet, analgesics for pain, and nonirritating gargles (saline) should relieve the symptoms. Give antibiotics for initial or complicating bacterial infection.

**3-5. ACUTE TONSILLITIS/STREP THROAT**

a. **Definition/Characteristics.**

   (1) **Tonsillitis.** Tonsillitis is a painful disease caused by bacteria or viruses that infect one or both of the palatine tonsils. People between the ages of 10 and 40 have the majority of tonsillitis attacks.
(2) Strep throat. Strep throat is an infectious disease that affects the membranes of the throat and tonsils. This disease is also called septic sore throat, acute streptococcal pharyngitis, and acute streptococcal tonsillitis. The disease is caused by group A beta-hemolytic streptococci bacteria. It spreads from person to person through droplets of moisture sprayed from the nose and mouth. Some people only carry the bacteria. These carriers exhibit no symptoms themselves, but spread the disease.

b. Signs/Symptoms.

(1) Sore throat.
(2) Strong breath odor.
(3) Pain on swallowing.
(4) Fever/chills.
(5) Posterior cervical lymphadenopathy (disease of the lymph nodes).
(6) Headache.
(7) Malaise.
(8) Red or swollen tonsils or pharynx (with or without fluid, cells, or cellular debris from blood vessels [exudates]).
(9) Increased white blood cells with bacterial pharyngitis.
(10) With bacterial pharyngitis (strep throat), the throat culture is positive.

c. Complications. Chronic tonsillitis, acute otitis media (accumulation of fluid in the middle ear), and acute sinusitis are complications which may occur as a result of tonsillitis or strep throat.

d. Treatment. Treatment includes rest, fluids, light diet, saline (salt water) gargles, and analgesics for pain. If indicated, prescribe antibiotics.

(1) Penicillin VK 250 mg, 1 tablet by mouth 6 times a day for 10 days.
(2) An alternate drug is erythromycin in the dosage of 250 mg. Take 1 tablet by mouth 6 times a day for 10 days.
(3) If the patient has difficulty swallowing, give benzathine penicillin G (bicillin), 1.2 million units intramuscularly.
Section II. UPPER RESPIRATORY DISEASES WITH SYSTEMIC EFFECTS

3-6. MONONUCLEOSIS

a. Definition/Characteristics. Characterized by the presence of more than the normal number of mononuclear leukocytes in the blood, mononucleosis gets its name from these mononuclear (single nucleus) cells. Although this disease occurs mostly in young adults, children and older people do sometimes contract mononucleosis. One of the herpes viruses, the Epstein-Barr virus, is the cause. The disease can be spread by direct contact between people—kissing, for example. A simple blood test can determine whether a person has mononucleosis. Some sheep's blood is mixed with a sample of clear liquid of the patient's blood. If the patient has mononucleosis, the sheep's blood cells will stick to one another.

b. Signs/Symptoms. The following signs and symptoms may be present:

(1) Fever.
(2) Malaise.
(3) Sore throat.
(4) Hepatic (liver) dysfunction.
(5) Lymphadenopathy (may cause lymph node enlargement).
(6) Hepatosplenomegaly (enlargement of the liver and spleen).
(7) Abnormal lymphocytes.
(8) Marked asthenia (weakness).

c. Treatment. There is no specific treatment for mononucleosis. Generally, rest and nourishment are prescribed. Specific symptoms are treated; for example, saline gargles for sore throat and analgesics for pain. Secondary infections are treated with appropriate antibiotics. Strenuous activities should be avoided.

d. Precautions. The symptoms of hepatitis and respiratory occlusion are treated. If the spleen ruptures, emergency removal of the spleen may be necessary.
3-7. **INFLUENZA**

a. **Definition/Characteristics.** Influenza is a highly contagious disease caused by a virus. The disease spreads by an infected person exhaling the virus, which is then breathed in by an uninfected person. Once inhaled, the virus comes in contact with cells of the upper air passages, and new influenza viruses are released in the body. These viruses infect other cells along the respiratory tract sometimes spreading deep within the lungs and to other parts of the body. The formerly healthy person exhales viruses that may be carried away by the air to be inhaled by someone else. Several different strains of virus including A, B, C, and swine viruses infect people. When the body produces substances called antibodies, people develop immunity or resistance to influenza. The antibodies attach themselves to influenza viruses and prevent the viruses from infecting cells. It is possible for the virus to change its chemical composition so that the antibodies no longer work. When this happens, the cells of the body must form new antibodies.

b. **Signs/Symptoms.** The onset of signs and symptoms is usually sudden and can include the following:

1. Slight fever lasting 1 to 7 days (usually 3 to 5 days).
2. Cough which is nonproductive and dry, occurring in spasms.
3. Headache.
4. Nasal stuffiness and discharge.
5. Mildly infected throat.
6. Chills.
7. Myalgia (pain in muscles).
8. Occasional nausea, diarrhea.

c. **Complications.** These complications can occur:

1. Necrosis of the respiratory epithelium (tissue death of linings in the respiratory system) which makes a secondary bacterial infection possible.
2. The most common complication is pneumococcal pneumonia.
3. The most serious complication is a staphylococcal infection.
d. **Diagnosis.** Isolation of the virus from throat washing or sputum allows a diagnosis of influenza.

e. **Treatment.** Bed rest is of great importance in order to prevent complications. Analgesics can be taken for muscle pain and headache. The patient should drink plenty of fluids. Antibiotics may be given for secondary bacterial infections.

f. **Prevention.** Flu vaccine is available for vaccination of the general population.

**Section III. LOWER RESPIRATORY DISEASES**

3-8. **ACUTE BRONCHITIS**

a. **Definition/Characteristics.** Acute bronchitis is inflammation of the bronchial mucous membrane of the bronchial tree. Infection, dust, chemical agents, and/or allergies can cause bronchitis. When the bronchi are infected, the mucous membranes (linings) of the bronchi secrete mucus and pus cells (white blood cells that can attack infectious agents). The large outpouring of mucus partially obstructs the airways. Additionally, the irritated membranes may swell, further obstructing the airways.

b. **Signs/Symptoms.**

   (1) Chilliness.

   (2) Malaise.

   (3) Soreness and constriction behind the sternum-worse when patient coughs.

   (4) Slight fever.

   (5) Cough, at first dry and painful; later, green or yellowish sputum with pus cells.

c. **Treatment.** Treatment should include bed rest and increased fluid intake. Medication to reduce the fever and pain can be taken. Antibiotics can be used, if indicated. Steam inhalation can open air passages.
3-9. **PLEURITIS**

a. **Definition/Characteristics.** Pleuritis is an inflammation of the pleural lining, a lining that covers the lungs and the chest cavity. The two surfaces of this lining are moist and allow the lungs to move smoothly over the chest wall when a person breathes. The surfaces of the lining become dry and rough. They rub together when the pleura lining is inflamed. This condition, called pleurisy or pleuritis, is very painful and becomes more painful when the person breathes deeply or coughs. Most cases of pleuritis occur as complications of some other respiratory condition such as pneumonia, tuberculosis, or another infectious disease. The underlying disease must be treated in order to cure the pleuritis.

b. **Signs/Symptoms.** Pleuritis signs and symptoms include the following.

(1) Pain--varies from vague discomfort to sharp severe stabbing in the chest. The pain becomes worse when the person coughs or breathes deeply.

(2) Respirations--short, shallow, and rapid.

(3) Motion--limited on the affected side.

(4) Breath--diminished sound.

(5) Fever.

(6) Chills.

(7) Friction rub--usually heard only after 24 to 48 hours.

c. **Treatment.** The patient should rest in bed, use heat on the area that is painful, and take analgesics for fever and mild pain.

3-10. **PNEUMONIA**

a. **Characteristics/Definition.** Pneumonia is an acute infection of the alveoli spaces of the lungs. Causes of pneumonia include injury to the respiratory mucosa with pneumonia as a secondary infection, influenza, common colds, and bronchitis. There are three types of pneumonia: bacterial, mycoplasmal (bacteria having no cell wall and bounded by a triple-layered membrane), and viral. Bacterial pneumonia is further subdivided into these types: pneumococcal; staphylococcal; klebsiella (Friedlander's bacillus); streptococcal; and influenza bacillus.

b. **Pneumococcal Pneumonia.** Sixty to eighty percent of bacterial pneumonia cases are pneumococcal pneumonia. This type of pneumonia, an inflammation of the lung tissue, is probably caused by a lowering of a person's natural resistance to
infection. These conditions that can lower a person’s resistance to this type of pneumonia include viral respiratory diseases, malnutrition, exposure to cold, exposure to noxious gases, and alcoholic intoxication.

(1) **Signs/Symptoms**.

(a) Mild nasopharyngitis (inflammation of the nasopharynx)–several days before onset of the disease.

(b) Sudden onset of illness.

(c) Vomiting.

(d) Severe chest pain (occurs in 70 percent of the cases).

(e) Productive cough with rusty sputum.

(f) Fever (103°F to 106°F) and chills.

(g) Often acutely ill.

(h) Dyspnea (labored breathing) and cyanosis. Cyanosis in light-skinned individuals gives a bluish cast to skin, lips, and nail beds. In dark-skinned individuals or blacks, the discoloration is grey or grayish. The cause is not enough oxygen in the blood.

(i) Decreased movement on one side of the chest.

(j) Severe, shaking chill.

(k) Signs of consolidation (inflammatory solidification of the lung); dull to percussion; bronchial breath sounds; fine rales.

(l) Gram-positive diplococci (bacterium which has not separated but occurs in pairs as a result of disease).

(m) Blood culture positive.

(n) Chest x-rays originally showing vague haziness but later showing shadows in area of lung involvement.

(2) **Course**. Fever and symptoms subside dramatically within 72 hours after the start of the antibiotics in over fifty percent of the patients. When the patient begins to get better, the fine rales and tubular breathing become coarse, sticky rales. If the patient experiences pseudocrisis (the fever subsides, but the other symptoms continue), watch for shock.
(3) **Treatment.**

(a) The drug of choice is penicillin given by intramuscular injection. The dosage ranges from 600,000 units of procaine penicillin every 12 hours if the illness is moderate to 1 million units of aqueous penicillin G given every 4 hours in an intravenous infusion for a patient seriously ill. Continue penicillin treatment 72 hours after the patient's temperature has returned to normal. If the patient is allergic to penicillin, administer tetracycline or erythromycin.

(b) The patient should have bed rest, oxygen, fluids, and electrolytes. In two to three weeks, the patient should have a follow-up chest x-ray.

(4) **Prognosis.** In treated groups, there is 95 percent recovery. In groups of people who are untreated, 20 to 40 percent do not survive (usually in the under 2 age group and the over 45 age group).

**Section IV. OTHER CAUSES OF PNEUMONIA**

3-11. **INTRODUCTION**

Other causes of pneumonia include other bacteria, viruses, mycoplasmas, pulmonary embolus, and atelectasis. The physical findings and x-ray evidence may be similar. In order to treat a pneumonia case properly, it is important to determine the cause by blood culture and sputum examination. Occasionally, other methods may be necessary to determine the cause.

3-12. **STAPHYLOCOCCAL PNEUMONIA**

a. **Predisposing Factors.** A person with a respiratory tract viral infection can contract this type of pneumonia. A debilitated patient such as a postsurgical patient also may contract staphylococcal pneumonia.

b. **Signs/Symptoms.** Signs of consolidation (dullness and tubular breathing) are infrequent, but pleural effusion (liquid in the pleural space) is common. Gram-positive cocci (bacterial cells) help confirm that the patient has staphylococcal pneumonia.

c. **Treatment.** Initial treatment consists of a vigorous antibiotic which should be a penicillin derivative other than penicillin G or ampicillin. If the patient is sensitive to penicillin, the next drug of choice would be cephalothin given for 8 to 14 days and administered intravenously or vancomycin twice a day administered intravenously.

d. **Prognosis.** There is 15 to 20 percent mortality. Whether or not the patient recovers depends on his underlying general health and the effect of the drug administered on the virus.
3-13. MYCOPLASMAL PNEUMONIA

Mycoplasmas can be defined as bacteria that do not have a cell wall. Mycoplasma pneumonia is a respiratory, disease-producing microorganism that occurs from time to time and spreads in groups of people—the family, school populations, the military.

a. Signs/Symptoms.

(1) Slow onset of headache and malaise.
(2) Cough, nonproductive or a small amount.
(3) Not acutely ill.
(4) No cyanosis or dyspnea.
(5) Only mild signs of consolidation.
(6) Shadows on the chest x-ray.
(7) White blood count is normal.
(8) Gram stain shows normal flora (flora-normal bacteria in intestine).
(9) Frequently affects families.
(10) Generally, limits itself.
(11) Cold agglutinins positive (50 percent or more).

b. Treatment. Follow the same general measures as for pneumococcal pneumonia. Antimicrobial drugs are not necessary in mild or moderate cases of this disease. In severe cases, tetracycline or erythromycin may be given for two or three weeks.

3-14. VIRAL PNEUMONIA

Viral pneumonia may be caused by the adenoviruses (a group of DNA viruses, some of which can cause respiratory tract infections), respiratory viruses, the parainfluenza viruses, and probably other viruses not yet identified with viral pneumonia. It is difficult to distinguish viral pneumonia from primary atypical pneumonia on the basis of physical and x-ray findings. It is necessary to examine sputum by Gram’s stain and culture to diagnose viral pneumonia.
a. **Signs/Symptoms.** The onset of viral pneumonia is usually slow and occurs after an upper respiratory infection. The disease is similar to mycoplasmal pneumonia except that the illness is shorter and cold agglutinins and lymphocytosis are negative. The disease, however, is dangerous to two groups of people: debilitated persons with chronic pulmonary or cardiac disease and infants under six months. For these patients, the disease is rapid and often fatal. The signs of the disease are much like those for pneumococcal pneumonia. Other signs and symptoms for persons not in these two high risk groups include:

1. Mild rales.
2. Nonproductive cough.
3. Mild illness.
4. Abnormal chest x-ray, rarely.

b. **Treatment.** Treatment is supportive in that the symptoms should be treated. No antibiotics are given.

### 3-15. BRONCHIAL PNEUMONIA

Bronchial pneumonia is an infection of the alveolar spaces of the respiratory bronchiole.

a. **Signs/Symptoms.** Bronchial pneumonia begins slowly, often after a person has had an upper respiratory infection. The patient may cough and spit out greenish, yellowish sputum. The patient's chest may be congested and feel tight, yet a percussion examination will be normal. Auscultation indicates the patient has scattered rhonchi, usually on both sides of the chest. His respiration, pulse, and temperature will be above normal.

b. **Treatment.** Treat the symptoms of the disease. Specific problems can be treated with drugs. A patient with mycoplasmal pneumonia can be given tetracycline. Administer penicillin to patients with either pneumococcal or streptococcal pneumonia. If the patient has gram-negative rods, administer streptomycin.

Continue with Exercises

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EXERCISES, LESSON 3

INSTRUCTIONS. Answer these exercises by writing the answer in the space provided. After you have answered all the exercises, turn to "Solutions to Exercises" at the end of the lesson and check your answers.

1. Fever and chills, facial and tooth pain, and a headache which is worse during the day are symptoms of _________________________________.

2. Acute pharyngitis is sometimes a symptom of a specific disease such as measles, _______________________, whooping cough, or chickenpox.

3. Abnormal lymphocytes, lymph node disease, and hepatic dysfunction are symptoms of _________________________________.

4. ___________________________________, an inflammation of the lining which covers the lungs and chest cavity, is usually a complication of some other respiratory condition such as pneumonia or tuberculosis.

5. Acute bronchitis can be caused by dust, chemical agents and/or ________________ to pollens.

6. Three types of pneumonia are bacterial pneumonia, _______________________ pneumonia, and viral pneumonia.

7. When the patient breathes in airborne pollen, his nasal passages become inflamed. He is suffering from _________________________________.

8. A patient with an increased white blood cell count, pain on swallowing, and strong breath odor could have strep throat or _______________________.


9. A highly contagious disease caused by a virus whose strains include A, B, and C is ________________________________.

10. Nasal congestion, profuse watery discharge, itching of nose and conjunctiva, and sneezing are all signs and symptoms of ____________________________.

11. Paranasal sinusitis is ____________________________ ________________

12. There are over ninety distinct strains of ____________________________ that can cause the common cold.

13. The most common causes of acute pharyngitis are bacterial infection and ____________________________

14. Septic sore throat and acute streptococcal pharyngitis are other names for the respiratory infection commonly called ____________________________.

15. The respiratory disease which gets its name from the abnormal increase in single nucleus cells in the body is ____________________________.

16. Influenza is a highly contagious disease which is caused by ____________________________.

17. A person with pleuritis most likely has some other respiratory condition such as ____________________________, ____________________________, or another infectious disease.

18. Mild rales, nonproductive cough, and ____________________________ are signs and symptoms of viral pneumonia.

Check Your Answers on Next Page
1. Paranasal sinusitis. (para 3-2b(1)(a)-(d))
2. Scarlet fever. (para 3-4a)
3. Mononucleosis. (para 3-6b)
4. Pleuritis. (para 3-9)
5. Allergies. (para 3-8a)
6. Mycoplasmal. (para 3-10a)
7. Allergic rhinitis. (para 3-1a)
8. Tonsillitis. (para 3-5b)
9. Influenza. (para 3-7a)
10. Allergic rhinitis. (para 3-1b)
11. Paranasal sinusitis is an infection of the mucous membranes which line the paranasal sinuses or the bony framework of the sinuses. (para 3-2a)
12. Rhinovirus. (para 3-3a)
13. Viral infection. (para 3-4a)
14. Strep throat. (para 3-5a(2))
15. Mononucleosis. (para 3-6a)
16. A virus. (para 3-7a)
17. Pneumonia, tuberculosis. (para 3-9a)
18. Mild illness. (para 3-14a)

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