Objectives:

- Learn about the cause of Pneumococcal infection
- Learn about pneumonia
- Understand about the symptoms and treatments as well as vaccination for pneumococcal infections

Pneumococcal infections are caused by *Streptococcus pneumoniae* which is also called pneumococcus. It is a gram positive coccus that commonly inhabits the upper respiratory tract especially during the winter and early spring. Rarely do the pneumococcus cause illness. The most dangerous of infections they can cause is pneumonia. **Pneumonia** is an infection of the small air sacs of the lungs called the **alveoli** and the tissues that surround them. In the U.S., about 2 million people develop pneumonia each year, and 40,000 to 70,000 of them die. It is the 6th most common cause of death overall and the most common fatal infection acquired in hospitals. In developing countries, it often ties with diarrhea based diseases as the leading cause of death. Community acquired pneumonia (gotten when walking around town or a family members) is most commonly gotten by infection with pneumococcus. People at particular risk of developing pneumococcal infection include those with chronic illnesses and a weakened immune system—for example, people with Hodgkin's disease, lymphoma, multiple myeloma, malnutrition, and sickle cell disease. Older people also often develop pneumococcal infections. Because the spleen normally help prevent pneumococcal infection, people who have had their spleen removed (asplenic) or who have a nonfunctioning spleen are also at risk. Pneumococcal pneumonia also may develop after chronic bronchitis or if a common respiratory virus, notably the influenza virus, damages the lining of the respiratory tract.

Symptoms begin suddenly with sharp chest pains and shaking chills. Sometimes, these symptoms follow the symptoms of a viral upper respiratory tract infection (sore throat, stuffed nasal passages, runny nose, and nonproductive cough). Fever and cough develop, and the cough produces sputum, which may have a rusty color. The person feels generally sick and is often short of breath. Sometimes, doctors can recognize pneumococci when examining a sample of sputum under a microscope (you would notice small dark cocci). Usually, however, a sample of sputum, pus, or blood is sent for culture. Chest x-rays are taken to look for pneumonia. Pneumococcal ear infections are common in children. These infections cause ear pain and a red, bulging eardrum. Cultures and other diagnostic tests are usually not done. The use of a vaccine against pneumococci in children very significantly lowers the rate of serious infection. Penicillin was the preferred antibiotic for most pneumococcal infections but antibiotic resistance has been increasingly common. It is taken by mouth for ear and sinus infections and given intravenously for more severe infections. Pneumococci that are resistant to penicillin are becoming increasingly common, so newer quinolone antibiotics are often used.

In a one page essay, describe the cause of Pneumococcal infections. Describe what is so important about Pneumococcal pneumonia and how to treat it. What is the problem with the 80 different types of pneumococcus and how the different types of vaccines for pneumococcal infections help. What are the major kinds of pneumococcal vaccinations and their limitations?

**Vocabulary to know from this Clinical Correlate:**

Pneumonia
Alveoli
Community acquired
Asplenic