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Pneumonia

What Is Pneumonia?

Pneumonia is a lung disease characterized by the inflammation of tissues in one or both lungs. Several types of pneumonia are known, each named for the setting in which it is transmitted. For example, hospital-acquired pneumonia (HAP) is pneumonia that someone develops while he or she is in the hospital. Other types of pneumonia include community-acquired pneumonia (CAP), aspiration pneumonia, and atypical pneumonia. CAP is the most common form of pneumonia; it leads to about four million cases of pneumonia per year in the United States.

CAP spreads in the wider community through respiratory contact. When you inhale the disease-causing organisms (pathogens) by being near a person who has pneumonia, you may develop the disease. HAP is often more serious than CAP, in part because it usually strikes people who are already sick. Further, HAP develops in hospitals, where pathogens are more common than in the wider community. These include the particularly dangerous drug-resistant strains. Patients also may get pneumonia in other health care settings, such as nursing homes, dialysis centers, and outpatient clinics. This disease form is called health care-associated pneumonia.

Aspiration pneumonia can develop if you accidentally inhale food, drink, vomit, or saliva from your mouth into your lungs. Aspiration pneumonia usually happens when something disturbs your normal gag reflex. Such disturbances can be results of brain

injury, the excessive use of alcohol or drugs, or other swallowing problems. Aspiration pneumonia can cause the formation of pus in the lung (lung abscesses).

Atypical pneumonia refers to cases of CAP that result from less common bacteria (*Legionella pneumophila*, *Mycoplasma pneumoniae*, and *Chlamydia pneumoniae*).

Pneumonia can be life threatening in three situations: when it causes acute respiratory distress, when it is due to a drug-resistant bacterial strain, and when the infection spreads from the lungs to the bloodstream. However, these life-threatening cases are relatively rare.

What Causes Pneumonia?

Most cases of pneumonia result directly from the growth of microorganisms in the lungs. These microorganisms include bacteria, viruses, and fungi. However, these growths are often complications of other diseases or of their treatment. For example, flu (viral influenza) can cause both viral and bacterial forms of pneumonia. Many cases of bacterial pneumonia, especially among the elderly and disabled, develop after the patient has the flu or a common cold.

Diverse organisms can cause the lung infections that produce pneumonia: they include bacteria, viruses, and fungi.

Bacteria

Bacteria are the most common cause of pneumonia in adults. Dozens of different types of bacteria can cause pneumonia.

The most common cause of pneumonia in the United States is the bacterium *Streptococcus pneumoniae*, or pneumococcus. However, another form of the disease often develops among people who live or work in crowded places such as schools, homeless shelters, and prisons. This form is called *Mycoplasma pneumoniae*; it usually affects people who are younger than 40 and is usually mild and responsive to antibiotics.

Other forms of bacterial pneumonia include *Legionella pneumophila* and *Chlamydophila pneumoniae*. The first of these, also called Legionnaire's disease, is now associated with public places in which people inhale bacteria that grow in re-circulated water such as that in decorative fountains and whirlpool spas. The second form, *Chlamydophila pneumoniae*, is most common in people who are between 65 and 79 years of age. Fortunately, it is usually a mild form of pneumonia.

Viruses

Respiratory viruses cause up to one-third of the pneumonia cases in the United States each year. These viruses are the most common cause of pneumonia in children younger than five years of age.

The flu virus is the most common cause of viral pneumonia in adults. Other viruses that cause pneumonia include the herpes simplex virus, H5N1 influenza (bird flu) virus, and SARS-associated coronavirus (SARS-CoV).

It is important to be aware that if you have viral pneumonia, you run the risk of getting bacterial pneumonia also.

Fungi

Serious fungal infections are most common in people who have weak immune systems, such as HIV/AIDS sufferers and people who have taken immune-suppressant medication. The fungi that cause pneumonia (such as *Cryptococcus neoformans*) are usually harmless to people who have normal immune systems.

Who Is at Risk of Pneumonia?

Anyone can develop pneumonia, but you are more likely to do so if you have any of the following conditions or life patterns:

- ❖ Smoke
- ❖ Drink heavily
- ❖ Are undergoing chemotherapy
- ❖ Have had chest surgery or other major surgery

- ❖ Have a weakened immune system (because of cancer treatment, HIV/AIDs, severe wounds, or immunosuppressant medicines)
- ❖ Have chronic lung disease (cystic fibrosis, asthma, or COPD)
- ❖ Have compromised reflexes
- ❖ Have had your spleen removed
- ❖ Are over 60 years of age or are over 50 years of age and have one or more other risk factors

What Are the Signs and Symptoms?

Pneumonia often appears with the following symptoms:

- ❖ Fever
- ❖ Cough
- ❖ Shortness of breath
- ❖ Sweating
- ❖ Shaking
- ❖ Chills
- ❖ Chest pain that fluctuates with breathing (pleurisy)
- ❖ Headache
- ❖ Muscle pain
- ❖ Fatigue

Occasionally, pneumonia may produce these symptoms:

- ❖ Coughing up blood (hemoptysis)
- ❖ Nausea and vomiting
- ❖ Pain in your joints and muscles

Severe pneumonia may appear with symptoms such as these:

- ❖ A bluish tint in the skin (cyanosis)
- ❖ Extreme paleness
- ❖ Confusion and disorientation, particularly in elderly people

How Is Pneumonia Diagnosed?

Many cases of pneumonia remain undiagnosed because symptoms mimic those of a bad chest cold. For example, many cases of mycoplasma pneumonia go undiagnosed and untreated.

If you see your doctor about symptoms that may indicate pneumonia, he or she will discuss your personal and familial health history. In addition, you may undergo some or all of these tests:

Physical Exam

During the exam your doctor listens to your lungs with a stethoscope to check for abnormal bubbling or crackling sounds (rales) and for rumblings (rhonchi) that signal the presence of thick liquid.

Chest X-rays

X-rays can confirm the presence of pneumonia and determine the extent and location of the infection.

Sputum Testing

To collect a sputum sample, your doctor will ask you to cough deeply. The resulting sputum will be labeled and sent to a laboratory for analysis. Lab staff identifies the bacterial content, allowing your doctor to determine the best available antibiotic for you.

Urine Antigen Testing

Urine tests allow your doctor to detect any *Streptococcus pneumoniae* and *Legionella pneumophila*. These tests are easy to perform and provide rapid results.

Blood Testing

Blood testing provides two benefits. First, an elevated number of white blood cells (WBC) per unit volume of blood indicates the presence of infection and helps to indicate the presence and severity of any pneumonia. Secondly, blood cultures can be studied in detail and used to determine the best antibiotic.

Blood Oxygen Measurement

This test allows measuring the oxygen levels in your blood to assess your level of illness. By way of a light sensor attached to your finger or ear, a technician can measure your blood oxygen level using infrared light.

Bronchoscopy

In this procedure a physician uses a thin, flexible tube with a camera to view the trachea and bronchi (the tubes between the trachea and lungs). Through the bronchoscope, the doctor or referred technician can view lung tissue directly and collect small fluid samples. Your doctor can use these samples and data to determine whether there is an underlying cause of infection, such as a growth or inhaled foreign body. Bronchoscopy is done only in the rare cases when patients hospitalized for pneumonia do not improve with antibiotics.

What Are Common Treatments?

Pneumonia treatments reflect the type of pneumonia that you have and vary with the severity of your symptoms. However, almost all courses of treatment for pneumonia should include a follow-up office visit with your doctor and a follow-up x-ray.

Medications and other treatments are available for each of the following types of pneumonia:

Bacterial

Antibiotics are usually given for bacterial pneumonia. Although you may start to feel better shortly after beginning your medication, be sure to complete the entire course of antibiotics. Stopping medication too soon may cause your pneumonia to return or may help to create strains of bacteria that are resistant to antibiotics. Antibiotics available for pneumonia include amoxicillin, macrolide antibiotics including erythromycin, azithromycin (Zithromax®, Zmax®), and clarithromycin (Biaxin®).

Viral

Antibiotics are not effective against most viral forms of pneumonia. A few viral pneumonias may be treated with antiviral medications. However, the usual recommended treatment is rest and plenty of fluids.

Mycoplasma

Mycoplasma pneumonias are treated with antibiotics. However, recovery may not be immediate. In some cases, fatigue may continue long after the infection itself has cleared.

Fungal

If your pneumonia is caused by a fungus, treatment usually entails an antifungal medication such as fluconazole.

Hospitalization

If you have severe pneumonia, you will be hospitalized and treated with intravenous antibiotics. You may also need the use of a ventilator.

Can Pneumonia Be Prevented?

The following steps are very effective in helping to prevent pneumonia:

- ❖ Wash your hands frequently
- ❖ Get enough rest
- ❖ Follow a diet that is rich in fruits, vegetables and whole grains
- ❖ Refrain from smoking and avoid second-hand smoke
- ❖ Avoid those who have a cold or the flu
- ❖ Stay active
- ❖ Maintain a healthy weight
- ❖ Get treatment for Gastroesophageal Reflux Disease (GERD)

If you have pneumonia, try to avoid anyone with a compromised immune system. When that is not possible, protect others by wearing a facemask and coughing into a tissue.

Vaccination

Because pneumonia can be a complication of the flu, getting a yearly flu shot is a good way to prevent viral influenza pneumonia. If you are over 50 years of age, get vaccinated against pneumococcal pneumonia at least once. If you are over 50 years of age and have one or more additional risk factors, such as cardiovascular disease, repeat the pneumococcal vaccination once every five years.

A vaccine known as pneumococcal conjugate vaccine can help protect young children against pneumonia. It is recommended for all children younger than two and for children

of between two and five years of age who are at high risk of pneumonia. These children are those with an immune system deficiency, cancer, cardiovascular disease, or sickle cell anemia.

In addition, the pneumococcal conjugate vaccine is recommended for children in this age group who attend day care centers.

Should I Call My Doctor?

Remember that for some older adults and people with heart failure or lung ailments, pneumonia can quickly become a life-threatening condition.

Whether or not you have been diagnosed with pneumonia, seek emergency help in any of these circumstances:

- ❖ Your fingernails, toenails, or skin turns dark or bluish in color
- ❖ You are coughing up bloody sputum

If you have been diagnosed with pneumonia, call your doctor immediately or seek emergency medical help if any of these conditions develops:

- ❖ Significant, persisting chest pain
- ❖ Mental confusion
- ❖ A change in pneumonia symptoms and you also have another risk factor (age, smoking, heavy drinking, new injury, heart failure, ongoing chemotherapy, or a compromised immune system)
- ❖ You are taking a medication that compromises your immune system, such as prednisone

In addition, call your doctor if you have been diagnosed with pneumonia and develop:

- ❖ A fever
- ❖ Itching
- ❖ Swelling
- ❖ Rash
- ❖ Stomach pain

For More Information

For more information, refer to the following medical resources:

<http://www.medicinenet.com/pneumonia/article.htm>

<http://www.nlm.nih.gov/medlineplus/pneumonia.html>

The content in this document is neither intended nor recommended as a substitute for seeking professional medical advice, diagnosis or treatment. It is recommended that you seek the advice of your physician or other qualified healthcare professional regarding any medical questions related to the topics contained within this document, your health or conditions.