

Bacterial vs Viral Pneumonia

What is the Difference? By Krystina Ostermeyer RN, BSN, CDE

Aside from childbirth, pneumonia is the leading cause of hospital admission. In fact, it results in approximately 1 million adult hospital admissions annually – and 50,000 deaths. It is also the leading cause of sepsis, being responsible for approximately half of all sepsis cases.

Unfortunately, there is no one cause of pneumonia. In fact, no single microbe is responsible for at least 10% of pneumonia cases – meaning that there are a lot of variables when it comes to diagnosing pneumonia.

What is Pneumonia?

Pneumonia is an infection that affects the lungs. This infection causes the sacs of the lungs, the alveoli, to become inflamed, as well as become filled with fluid or pus. When infection develops, a myriad of symptoms can occur, such as fever, cough, and difficulty breathing.

Pneumonia can occur in any age group and can be mild or life-threatening. It is most dangerous to the very young and to the elderly, as these age groups are most likely to have weakened immune systems and other health problems.

Pneumonia can be caused by bacteria, fungi, and viruses. It is important to identify the organism that is causing pneumonia because the treatment plan varies.

Bacterial Pneumonia

Pneumonia caused by a bacterium is called *bacterial pneumonia*. There are many types of bacteria that may cause bacterial pneumonia, but the most common type *Streptococcus pneumoniae*. This type of pneumonia causes 900,000 infections yearly and hospitalizes approximately 400,000 people.

Common symptoms of bacterial pneumonia include:

- Chest pain while coughing
- Shortness of breath • Chills
- Sputum that is yellow or green mucous • Fever
- Fatigue

Bacterial pneumonia requires antibiotics for treatment; ideally, the antibiotic will target the specific type of bacteria. Steroids may also be used to improve breathing.

It is also common to hear bacterial pneumonia as “community-acquired pneumonia” if it

is “caught” in the community. If pneumonia is acquired while hospitalized for a different reason, it is often called “hospital-associated pneumonia” and “ventilator-associated pneumonia.” However, all of these types of pneumonia can also be viral pneumonia.

Viral Pneumonia

Approximately 30% of pneumonia cases are viral. This type of pneumonia typically occurs as a secondary infection from other viruses such as influenza, coronavirus, parainfluenza, adenovirus, and respiratory syncytial virus (RSV).

These types of viruses spread through air droplets. For example, a sneeze or a cough may cause sputum an air droplet to spread through the air, or the virus could land on a doorknob or a surface that is touched, then brought to the nose or mouth.

Symptoms of viral pneumonia are similar, although there are differences:

- A dry cough (note that there is rarely sputum produced with viral pneumonia)
- Fever
- Chills
- Chest pain
- Shortness of breath

While bacterial pneumonia is treated with antibiotics, this treatment will not help bacterial pneumonia. Viruses are not receptive to antibiotics. Occasionally, antiviral medications may be prescribed. For example, if pneumonia is secondary to influenza, oseltamivir (Tamiflu), zanamivir (Relenza), or peramivir (Rapivab) may help the virus from spreading. If pneumonia is secondary to RSV, ribavirin (Virazol) may be prescribed.

Fungal Pneumonia

Fungal pneumonia is not nearly as common as bacterial and viral pneumonia. When fungal pneumonia occurs, it is most likely in people with compromised immune systems or other chronic health conditions.

Fungal pneumonia occurs when a spore enters the lungs and begins to multiply.

The most common types of fungal pneumonia include:

Pneumocystis pneumonia. This type of pneumonia is caused by the *Pneumocystis jirovecii* fungus. It typically occurs in people who have seriously compromised immune systems, such as those with human immunodeficiency virus (HIV),

acquired immunodeficiency disease (AIDs), those who have had an organ transplant, or those who are undergoing treatment for cancer.

Coccidioidomycosis. The fungus that causes this specific type of pneumonia is called *Coccidioides*, and it is commonly found in west Texas, southern Arizona, southwestern New Mexico, and central California.

Histoplasmosis. *Histoplasma capsulatum* fungus is found in the Mississippi and Ohio river valleys and is spread by bat and bird droppings. Luckily fewer than five percent of people who have low levels of exposure will develop this type of pneumonia, but with high exposure, most people will develop pneumonia.

Cryptococcus. Although the *Cryptococcus* fungus can be found in soil worldwide, it is uncommon to have this fungal infection without a compromised immune system.

Prevention

The best way to prevent pneumonia of all types is proper hand hygiene. This means washing hands frequently, as well as using alcohol hand sanitizer when it is appropriate.

Staying away from sick people, especially if you have a compromised immune system, is also ideal.

Ask your physician if you should get a pneumococcal vaccine. ■

Resources

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