

## Fact Sheet

### *Pneumococcal*

#### **What causes pneumococcal disease?**

Pneumococcal disease is caused by *Streptococcus pneumoniae*, a bacterium. There are more than 80 subtypes. Most types can cause disease, but only a few produce the majority of invasive pneumococcal infections: the 10 most common types cause 62% of invasive disease worldwide.

#### **How does pneumococcal disease spread?**

The disease is spread person to person by droplets in the air. The pneumococci bacteria are common inhabitants of the human respiratory tract. They may be isolated from the nasopharynx of 5%-70% of normal, healthy adults.

#### **How long does it take to show signs of pneumococcal disease after being exposed?**

As noted above, many people carry the bacteria in their nose and throat without ever developing invasive disease. The incubation period for specific diseases caused by an invasive pneumococcal infection is noted below.

#### **What are the symptoms of pneumococcal disease?**

There are three major conditions caused by invasive pneumococcal disease: pneumonia, bacteremia, and meningitis. They are all caused by infection with the same bacteria, but have different symptoms.

Pneumococcal pneumonia (lung disease) is the most common disease caused by pneumococcal bacteria. It is estimated that 150,000-570,000 cases occur each year in the United States. The incubation period is short (1-3 days). Symptoms include abrupt onset of fever, shaking chills or rigors, chest pain, cough, shortness of breath, rapid breathing and heart rate, and weakness. The fatality rate is 5%-7% and may be much higher in the elderly.

Pneumococcal bacteremia (blood infection) occurs in about 25%-30% of patients with pneumococcal pneumonia. In the United States, it causes an estimated 16,000-55,000 cases per year. Bacteremia is the most common clinical presentation among children less than two years, accounting for 70% of invasive disease in this group.

Pneumococci cause 13%-19% of all cases of bacterial meningitis (infection of the covering of the brain or spinal cord) in the United States. There are 3,000-6,000 cases of pneumococcal meningitis each year. Symptoms may include headache, tiredness, vomiting, irritability, fever, seizures, and coma. Children less than one year have the highest rate of pneumococcal meningitis, approximately 10 cases per 100,000 population. The mortality rate is high (30% overall, up to 80% in the elderly).

Pneumococci are also a common cause of acute otitis media (middle ear infection). Approximately 30%-50% of such ear infections are caused by *S. pneumoniae*. Middle ear

infections are the most frequent reason for pediatric office visits in the United States, resulting in over 20 million visits annually.

### **How serious is pneumococcal disease?**

Pneumococcal infection is estimated to cause up to 6,000 deaths annually in the United States. Approximately half of these deaths potentially could be prevented through the use of vaccine. Young children and the elderly (less than five and older than 65) have the highest incidence of serious disease.

Case-fatality rates are highest for meningitis and bacteremia, and the highest mortality occurs among the elderly and patients who have underlying medical conditions. Despite appropriate antimicrobial therapy and intensive medical care, the overall case-fatality rate for pneumococcal bacteremia is about 20% among adults. Among elderly patients, this rate may be as high as 60%.

Before a vaccine was available in the United States, pneumococcal disease caused serious disease in children less than five years. Each year it was responsible for causing 700 cases of meningitis, 17,000 blood infections, five million ear infections, and 200 deaths. Children younger than two are at the highest risk for serious pneumococcal disease.

### **Is there a treatment for pneumococcal disease?**

Penicillin is the drug of choice for treatment of pneumococcal disease; however, resistance to penicillin and other antibiotics has been on the rise. Studies indicate that in some areas of the United States up to 35% of pneumococci are resistant to common antibiotics. Treating patients infected with resistant organisms requires expensive alternative antimicrobial agents and may result in prolonged hospital stays.

The increased difficulty of treating this serious bacterial infection makes prevention through vaccination even more important.

### **How long is a person with pneumococcal disease contagious?**

The exact period of communicability is not known. It appears that transmission can occur as long as the organism remains in respiratory secretions.

### **How common is pneumococcal disease in the United States?**

Providers are not required by law to report pneumococcal disease to health authorities, so exact numbers are not known. Estimates have been made from a variety of population studies, however, and it is believed that 45,000 cases of invasive pneumococcal disease (meningitis and blood infections) occur each year in the United States. (Pneumonia and middle ear infections are most common but are not considered "invasive" diseases.)

The incidence of the disease varies greatly by age group. The highest rate of invasive pneumococcal disease occurs in young children, especially those younger than two. Children with certain chronic diseases (such as sickle cell disease or HIV infection) are at very high risk of invasive disease.

### **Can you get pneumococcal disease more than once?**

Yes. There are more than 80 known types of pneumococcus bacteria, with 23 types included in the current pneumococcal polysaccharide vaccine. Having been infected with one type does not

always make the patient immune to other types. Even if an individual has had one or more episodes of invasive pneumococcal disease, he or she needs to be vaccinated.

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*This fact sheet is for information only and is not meant to be used for self-diagnosis or as a substitute for consultation with a health care provider. If you have any questions about the disease described above or think that you may have this infection, consult a health care provider.*

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