Pneumococcal Disease

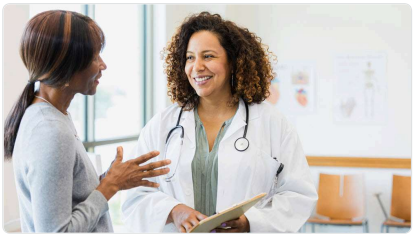
Clinical Overview of Pneumococcal Disease

Health Care Providers

FEBRUARY 6, 2024

KEY POINTS

- *Streptococcus pneumoniae* bacteria cause pneumococcal disease.
- Certain ages and medical or other conditions put people at increased risk.
- Vaccination is recommended to prevent pneumococcal disease.



Cause

Streptococcus pneumoniae are lancet-shaped, gram-positive, facultative anaerobic bacteria with more than 100 known serotypes. Most *S. pneumoniae* serotypes can cause disease, but only a minority of serotypes produce the majority of pneumococcal infections.

Carriage of pneumococci

Pneumococci are common inhabitants of the respiratory tract. The bacteria may be isolated from the nasopharynx of 5–90% of healthy persons, depending on the population and setting:

- **Adults without children:** 5–10% may be carriers
- **School-aged children:** 20–60% may be carriers
- **Service personnel on military installations:** 50–60% may be carriers

The duration of carriage varies and is generally longer in children than adults. Researchers do not clearly understand the relationship of carriage to the development of natural immunity.

Risk factors

Age, conditions, and other factors can increase someone's risk for pneumococcal disease, including severe infections.

Age

People at increased risk for pneumococcal disease include children younger than 5 years old and adults 65 years or older.

Medical and other conditions

Conditions and other factors that increase the risk for invasive pneumococcal disease include:

- Alcoholism
- Cerebrospinal fluid leak
- Chronic heart, kidney, liver, or lung disease
- Cigarette smoking
- Cochlear implant

- Decreased immune function from disease or drugs (i.e., immunocompromising condition)
- Diabetes mellitus

Chronic lung conditions that increase someone's risk include chronic obstructive pulmonary disease, emphysema, and asthma.

People with a cochlear implant appear to be at increased risk for pneumococcal meningitis specifically.

Immunocompromising conditions

Examples of immunocompromising conditions include:

- Chronic renal failure or nephrotic syndrome
- Congenital or acquired asplenia or splenic dysfunction
- Congenital or acquired immunodeficiency
- Disease or condition treated with immunosuppressive drugs or radiation therapy*
- HIV infection
- Sickle cell disease or other hemoglobinopathies

* This includes Hodgkin disease, leukemias, lymphomas, malignant neoplasms, and solid organ transplant.

Certain racial and ethnic groups

Experts do not know why, but people of **certain racial and ethnic groups** have increased rates of pneumococcal disease:

- Alaska Native people
- African American people
- Certain American Indian people

Close contact

Being in crowded settings (e.g., childcare, nursing homes) or certain living conditions (e.g., homelessness) can increase the risk of pneumococcal disease.

KEEP READING:
Risk Factors for Antibiotic-resistant *S. pneumoniae*

How it spreads

Transmission of *S. pneumoniae* occurs through direct **person-to-person** contact via respiratory droplets.

The pneumococcal serotypes most often responsible for causing infection are those most frequently found in carriers. Although carriage doesn't necessarily lead to disease, it's an important precursor for pneumococcal disease.

The following factors influence the spread of the organism **within a family or household**:

- Crowding
- Presence of upper respiratory infections or pneumococcal disease
- Season

Communicability

The period of communicability for pneumococcal disease is unknown. Presumably, transmission can occur as long as the organism appears in respiratory secretions.

Clinical features

The more serious clinical syndromes of pneumococcal disease are **pneumonia, bacteremia,** and **meningitis**. Less serious, but more common syndromes include **acute otitis media** and **sinusitis**.

KEEP READING:
Clinical Features

Prevention

Vaccination is the primary way to prevent pneumococcal disease.

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Prevention

Testing and diagnosis

Definitively diagnosing *S. pneumoniae* infection generally relies on isolating the organism from a normally sterile body site. Other tests, such as urinary antigen test to detect the C-polysaccharide antigen of *S. pneumoniae* or culture-independent molecular detection methods are also available.

KEEP READING:
Testing and Diagnosis

Surveillance and trends

CDC monitors invasive pneumococcal disease rates in the United States using two surveillance systems.

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Surveillance and Trends

Resources

Pneumococcal disease chapter of the Pink Book

Pneumococcal vaccination: Information for healthcare professionals

PneumoRecs VaxAdvisor app

SOURCES

CONTENT SOURCE:
National Center for Immunization and Respiratory Diseases; Division of Bacterial Diseases