

Section 16: *Streptococcus pneumoniae*, Invasive, (Pneumococcal Infection)

BASIC EPIDEMIOLOGY

Infectious Agent

Streptococcus pneumoniae (*S. pneumoniae*), is a beta hemolytic gram positive cocci.

Transmission

Transmission of *S. pneumoniae* occurs as a result of direct person-to-person contact via respiratory droplets and by autoinoculation in persons carrying the bacteria in their upper respiratory tract.

Incubation Period

The incubation period varies by type of infection and can be as short as 1 to 3 days.

Communicability

The period of communicability is unknown and may be as long as the organism is present in respiratory tract secretions but is probably less than 24 hours after effective antimicrobial therapy is begun.

Clinical Illness

The major clinical manifestations of invasive pneumococcal disease are bacteremia and meningitis. Pneumonia is the most common clinical presentation of pneumococcal disease among adults. Symptoms generally include an abrupt onset of fever and chills or rigors. Other common symptoms include pleuritic chest pain, productive cough, shortness of breath, rapid breathing, hypoxia, rapid heart rate, malaise, and weakness.

Bacteremia without a known site of infection is the most common invasive clinical presentation of pneumococcal infection among children 2 years of age and younger.

Severity

The case fatality rate of pneumococcal pneumonia is 5%-7% and may be much higher among elderly persons. Bacteremia occurs in about 25%-30% of patients with pneumococcal pneumonia. The case fatality rate of pneumococcal bacteremia is about 20%, but may be as high as 60% among elderly persons. The case fatality rate of pneumococcal meningitis is about 30% and may be as high as 80% among elderly persons.

DEFINITIONS

Clinical Case Definition

Streptococcus pneumoniae causes many clinical syndromes, depending on the site of infection (e.g., pneumonia, bacteremia, or meningitis). Only invasive *Streptococcus pneumoniae* is reportable.

Laboratory Confirmation

- Isolation of *S. pneumoniae* from a normally sterile site.

Normally sterile site: Invasive diseases typically cause significant morbidity and mortality. Sterile sites include:

- blood (excluding cord blood)
- cerebrospinal fluid (CSF)
- pericardial fluid
- pleural fluid
- peritoneal fluid
- bone or bone marrow

The following are also considered sterile sites when certain other criteria are met:

- joint fluid when the joint surface is intact (no abscess or significant break in the skin)
- internal body sites (brain, heart, liver, spleen, vitreous fluid, kidney, pancreas, lymph node or ovary) when the specimen is collected aseptically during a surgical procedure

Normally sterile sites do *not* include:

- Anatomical areas of the body that normally harbor either resident or transient flora (bacteria) including mucous membranes (throat, vagina), sputum, and skin, or abscesses or localized soft tissue infections.

Case Classifications

- **Confirmed:** A case that is laboratory confirmed
- **Probable:** No probable case definition

CASE INVESTIGATION

Case Investigation Checklist

- Confirm laboratory results meet the case definition. Only specimens from sterile sites are accepted as evidence of invasive disease.
 - See the Sterile Site and Invasive Disease Determination Flowchart for confirming a specimen meets the criteria for sterile site.
- Review medical records or speak to an infection preventionist or physician to verify case definition, identify underlying health conditions and describe course of illness.
 - The Streptococcal Investigation Form is available as a tool to use to record information. This form does not need to be sent to DSHS.
- Determine vaccination status of the case. Sources of vaccination status that should be checked include:
 - Case (or parent), IMMTRAC, school nurse records, primary care provider, etc

- All confirmed strep pneumo case investigations must be entered and submitted for notification in the NEDSS Base System (NBS). Please refer to the *NBS Data Entry Guidelines* for disease specific entry rules.

Control Measures

- Provide education on streptococcus as needed.
- Recommend that anyone experiencing symptoms be evaluated by a healthcare provider.
- Promote respiratory etiquette.
- Encourage vaccination per ACIP guidance.
 - Two pneumococcal vaccines are currently available for use in children, the pneumococcal conjugate vaccine (PCV7) and the pneumococcal polysaccharide vaccine (PPV23).
 - A pneumococcal polysaccharide vaccine (PPSV23) is licensed for use in adults 65 years and older and in persons ages 2-49 years with certain risk factors.

Exclusion

Children with a fever from any infectious cause should be excluded from school/daycare for at least 24 hours after fever has subsided without the use of fever suppressing medications.

MANAGING SPECIAL SITUATIONS

Case is a Suspected Health Care-Associated (Nosocomial) Infection

If one or more nosocomial (health care-associated) cases occur in patients of the same hospital, residential care facility, or other long-term care facility; and the cases have no other identified plausible source of infection; or if other circumstances suggest the possibility of nosocomial infection, notify Infectious Disease Control Unit (IDCU) at **(800) 252-8239** or **(512) 776-7676**.

Outbreaks

If an outbreak is suspected, notify Infectious Disease Control Unit (IDCU) at **(800) 252-8239** or **(512) 776-7676**.

The local/regional health department should

- Review infection prevention practices currently in place.
- Work with the facility to ensure everyone gets hand hygiene and respiratory etiquette education.
- Cohort ill patients / residents together.
- Encourage anyone with symptoms be evaluated by a healthcare provider.
- Review vaccination status of exposed persons and recommend vaccination as per ACIP guidance.
- Note: Treatment of asymptomatic carriers is considered ineffective.

REPORTING AND DATA ENTRY REQUIREMENTS

Provider, School & Child-Care Facilities, and General Public Reporting Requirements

Suspected cases of pneumococcal disease (*S. pneumoniae*) should be reported within 1 week to the local or regional health department or the Texas Department of State Health Services (DSHS), Infectious Disease Control Unit (IDCU) at **(800) 252-8239** or **(512) 776-7676**.

Local and Regional Reporting and Follow-up Responsibilities

Local and regional health departments should submit an NBS notification on all confirmed cases to DSHS within 30 days of receiving a report. Please refer to the *NBS Data Entry Guidelines* for disease specific entry rules. Investigations forms are not required to be submitted.

Local and regional health departments should report suspected outbreaks within 24 hours of identification to the regional DSHS office or to 512-776-7676 and submit a completed respiratory outbreak form at the conclusion of the outbreak investigation (fax a copy to the DSHS regional office and/or IDCU 512-776-7676).

LABORATORY PROCEDURES

Testing for pneumococcal disease is widely available from most hospital or private laboratories. Pneumococcal serotyping is no longer available through the DSHS laboratory.