Streptococcus pyogenes, Invasive (Group A *Streptococcus*) rev Jan 2018

BASIC EPIDEMIOLOGY

Infectious Agent

Streptococcus pyogenes (group A *Streptococcus* [GAS]) are beta-hemolytic, Gram-positive cocci. There are over 130 serotypes.

Transmission

Spread occurs via large respiratory droplets and direct contact. Spread via indirect contact with objects is rare. Foodborne spread has been associated with milk, milk products and egg products. Food products are contaminated by an infected individual. Raw milk may be contaminated if GAS is transmitted to the cow.

Incubation Period

The incubation period is 1 to 5 days.

Communicability

Untreated cases may be infectious for 10–21 days, and longer if purulent discharges are present. The infectious period ends 24 hours after start of appropriate treatment. Asymptomatic carriage is possible.

Clinical Illness

Group A Streptococcal disease has multiple invasive and non-invasive presentations. Non-invasive presentations include strep throat, scarlet fever, impetigo, cellulitis, otitis media and wound infections. Invasive presentations include meningitis, septicemia, septic arthritis, necrotizing fasciitis, peritonitis, osteomyelitis and toxic-shock syndrome.

Severity

Severity varies by clinical presentation. Mortality of invasive infections ranges from 12%–13% and can be as high as 40% in cases with toxic shock syndrome. The Centers for Disease Control and Prevention estimates that 0.4 deaths per 100,000 people occur annually.

DEFINITIONS

Clinical Case Definition

Invasive group A streptococcal infections may manifest as any of several clinical syndromes, including pneumonia, bacteremia in association with cutaneous infection (e.g., cellulitis, erysipelas or infection of a surgical or nonsurgical wound), deep soft-tissue infection (e.g., myositis or necrotizing fasciitis), meningitis, peritonitis, osteomyelitis, septic arthritis, postpartum sepsis (i.e., puerperal fever), neonatal sepsis and non-focal bacteremia.

Laboratory Confirmation

- Isolation of group A *Streptococcus* (*Streptococcus pyogenes*) by culture from a normally sterile site
- Isolation of group A *Streptococcus* (*Streptococcus pyogenes*) by culture from any site when toxic-shock syndrome or necrotizing fasciitis is present

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

- Blood (excluding cord blood)
- Bone or bone marrow
- Cerebrospinal fluid (CSF)
- Pericardial fluid
- Pleural fluid
- Peritoneal fluid

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

- 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
- Joint fluid when the joint surface is intact (no abscess or significant break in the skin)

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

See the Sterile Site and Invasive Disease Determination Flowchart in Appendix A for confirming that a specimen meets the criteria for sterile site.

Case Classifications

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

Note: A person with group A *Streptococcus* isolated 2 or more times within a 6-month timeframe (regardless of calendar year) should only be counted once as a case unless additional information is available to indicate a distinct infection, e.g., different serotype, etc.

See the Streptococcal Infection: Case Status Classification Flowchart in Appendix A for assistance with case classification.

SURVEILLANCE AND CASE INVESTIGATION

Case Investigation

Local and regional health departments should investigate all reports of suspected group A *Streptococcus*. In-depth investigation involving patient interviews is not required **but confirmation of case status is necessary**.

Case Investigation Checklist

- ☐ Confirm that laboratory results meet the case definition.
  - See the Sterile Site and Invasive Disease Determination Flowchart, in Appendix A, for confirming that a specimen meets the criteria for sterile site.
- ☐ Review medical records or speak to an infection preventionist or healthcare provider to verify that the case meets case definition, identify underlying health conditions and describe the course of illness.
  - The Invasive Streptococcal Case Report Form is available at http://www.dshs.texas.gov/idcu/investigation/ and can be used to record information. This form does not need to be sent to DSHS.
- ☐ If applicable, see the Managing Special Situations section.
- ☐ All confirmed 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 invasive group A *Streptococcus* as needed.
- Use appropriate food safety practices.
- Recommend only pasteurized milk be consumed.
- Prohibit infected people from handling milk and prohibit people with uncontained skin lesions from handling prepared food.
- Recommend that anyone experiencing symptoms including signs of a wound infection (redness, swelling, drainage, pain) be evaluated by a healthcare provider.
- Promote basic control measures which include:
  - Keep cuts, scratches, sores and wounds clean and covered.
  - Cover your mouth and nose when you sneeze and cough.
  - Wash your hands often using hot water and soap.
  - Don't share toothbrushes or eating utensils.
  - Vaccinate children over 1 year of age against chickenpox. (Some children get invasive GAS infection right after they've had chickenpox.)

Note: For household contacts of persons with invasive GAS infection, routine screening for GAS colonization and chemoprophylaxis is not recommended.

Exclusion

Children with streptococcal sore throat or scarlet fever should be excluded from school and daycare until 24 hours after initiation of antibiotic treatment and until fever subsides. Children with a fever from any infectious cause should be excluded from school and daycare for at least 24 hours after fever has subsided without the use of fever-suppressing medications.

MANAGING SPECIAL SITUATIONS

Case is a Suspected Healthcare-Associated Infection

If one or more healthcare-associated (nosocomial) cases occur in patients of the same dental or healthcare provider, acute care 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 EAIDB at **(800) 252-8239 or (512) 776-7676**. A single case of postpartum or post-surgical GAS infection requires prompt epidemiologic investigation and assessment of potential nosocomial spread from an asymptomatic carrier may be required.

The local/regional health department should:

- Review infection prevention practices at the facility.
- Request the facility to conduct enhanced surveillance for GAS for 6 months before and after the first (and last) case is identified.
- Work with the DSHS EAIDB Healthcare-Associated Infections (HAI) Team or the regional HAI epidemiologist to rule out transmission within the healthcare setting.

Outbreaks

If an outbreak is suspected, notify EAIDB at **(800) 252-8239 or (512) 776-7676**. Outbreaks of invasive disease in children or of rheumatic fever require immediate public health attention.
The local/regional health department should:

- Rule out foodborne exposure.
- Work with the facility to ensure staff and students/residents get hand hygiene and respiratory etiquette education.
- Recommend that staff with streptococcus infections be restricted from working until 24 hours after appropriate antibiotic treatment is initiated.
- Encourage anyone with symptoms to be evaluated by a healthcare provider.
- In childcare settings, limit transfers of children to other childcare settings.
- If cases continue to occur after basic control measures are implemented and the contacts are at high risk for complications or the presentation of illness is severe (rheumatic fever, acute nephritis, toxic-shock syndrome, necrotizing fasciitis, etc.), consider testing to identify carriers.

REPORTING AND DATA ENTRY REQUIREMENTS

Provider, School, Child-Care Facility, and General Public Reporting Requirements
Confirmed cases are required to be reported **within 1 week** to the local or regional health department or to DSHS EAIDB at **(800) 252-8239 or (512) 776-7676.**

Local and Regional Reporting and Follow-up Responsibilities
Local and regional health departments should:

- Enter the case into NBS and submit an NBS notification on all **confirmed** cases to DSHS within 30 days of receiving a report of a confirmed case.
    - Please refer to the *NBS Data Entry Guidelines* for disease-specific entry rules.
    - A notification can be sent as soon as the case criteria have been met. Additional information from the investigation may be entered upon completion of the investigation.
- If the investigator filled out an investigation form, fax, send by secure email or mail it when the NBS notification is submitted.
    - Investigation forms may be faxed to **512-776-7616**, securely emailed to the IRID Public Health and Preventionist III, or mailed to:

      Infectious Disease Control Unit
      Texas Department of State Health Services
      Mail Code: 1960
      PO Box 149347
      Austin, TX 78714-9347

When an outbreak is investigated, local and regional health departments should:

- Report outbreaks within 24 hours of identification to the regional DSHS office or to the EAIDB at **512-776-7676**.
- Submit a completed **Respiratory Disease Outbreak Summary Form** at the conclusion of the outbreak investigation.
    - Fax or send by secure email a copy to the DSHS regional office and/or to EAIDB at 512-776-7676. . The secure email should be sent to the IRID team lead at EAIDB.
    - The Respiratory Disease Outbreak Summary Form is available at http://www.dshs.texas.gov/idcu/investigation/.

LABORATORY PROCEDURES

Testing for group A *Streptococcus* is widely available from most private laboratories. In general, specimens should not be submitted to the DSHS laboratory. However, if prior approval is obtained from DSHS EAIDB, isolates may be submitted to DSHS for genotyping (PFGE) in cluster or outbreak investigations.

UPDATES

January 2018

- Definitions: changed some of the formatting for normally sterile site paragraphs
- Surveillance and Case Investigation: added the location in the Emerging Acute Infectious Disease Guidelines of where a person could find the Sterile Site and Invasive Disease Determination Flowchart
- Reporting and Data Entry Requirements: added that completed investigation forms may be sent to the IRID Public Health and Preventionist III by secure email and the completed Respiratory Disease Outbreak Summary Form may be sent to the IRID team lead by secure email