Invasive Group A Strep Follow up: Acute Care, Long Term Care, and Beyond

Alexandra De Jesus, MPH

Epidemiologist

Division of Epidemiology and Immunization

Bureau of Infectious Disease and Laboratory Sciences

Massachusetts Department of Public Health
Learning Objectives

• Provide an overview of group A strep (GAS) infections

• Review trends in invasive GAS infections in MA

• Discuss steps in case investigations

• Briefly review follow up for complicated investigations (i.e. outbreaks in LTCF, post-surgical, or post-partum cases)

• Highlight GAS resources for LBOHs
Overview of GAS
What is GAS?

• Bacteria (gram+ cocci) found in throat and on skin

• Can colonize without causing symptoms
  – Carriage can be as high as 15%

• Non-invasive disease is most common
  – Strep throat, impetigo

Photo Source: http://outbreaknewstoday.com/canada-increase-invasive-group-strep-reported-thunder-bay-50769/
How does GAS spread?

• Spread by direct contact with nose and throat discharges of an infected individual or with infected skin lesions.

• The risk of spread is greatest when an individual is symptomatic, such as with strep throat or an infected wound.

• Individuals who carry the bacteria but have no symptoms (colonized) are much less contagious.
How does GAS spread? (Continued)

• Incubation Period
  
  – The incubation period for GAS pharyngitis is usually short: 1–5 days (rarely longer)
  
  – The incubation period for invasive GAS disease is variable and depends on the type of infection and host factors
How does GAS spread?  
(Continued)

- Infectious Period
  - In untreated, uncomplicated GAS disease, the infectious period starts several days before onset of symptoms and lasts from 10–21 days
  - If purulent discharge is present, the infectious period may be extended from weeks to months
  - Persons with untreated GAS pharyngitis may carry and transmit the bacteria for weeks or months, with contagiousness sharply decreasing 2–3 weeks after onset of the illness
• Appropriate antibiotic treatment for at least 24 hours is sufficient to end the patient’s infectious period
How does GAS become invasive?

- Occurs when bacteria get past defenses and have invaded parts of the body, such as the blood, deep muscle, fat tissue, or the lungs.

- Infection may occur when a person has sores or other breaks in the skin (such as cuts, chicken pox, or surgical wounds) that allow the bacteria to get into the tissue.

- Although healthy people can get invasive GAS disease, people with chronic illnesses such as cancer, diabetes, kidney dialysis, end stage renal disease, and those who use medications such as steroids, are at higher risk.
In addition, there are certain strains of GAS that are more likely to cause severe disease than others.

- The reason why some strains will cause more severe illness is not totally clear but may involve the production of toxins that cause shock and organ damage and enzymes that cause tissue destruction.
Statistics on Invasive GAS Infections

- 11,000-13,000 cases of invasive disease occur each year in US
  - Translates to ~ 3.4-4.8 cases/100,000 population

- Death occurs in 10%-13% of all invasive cases, 45% of Streptococcal Toxic Shock Syndrome (STSS) and 25% of Necrotizing Fasciitis (NF) cases
  - Organ system failure can occur in cases with STSS
  - Amputation may be necessary in cases of NF

Photo source: http://healthooze.com/necrotizing-fasciitis-causes-pictures-diagnosis-treatment-prevention/
What Classifies a Group A Strep Infection as Invasive?

• Isolation of GAS from a normally sterile site (i.e. a body site normally free of germs) or

• Isolation of GAS from a nonsterile site in the presence of STSS or NF
# Examples of Sterile and Non-sterile Sites

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Clinical Presentations of Invasive GAS Infections

• Invasive GAS infection may manifest as any of several clinical syndromes, including:
  
  – Pneumonia
  – Bacteremia
  – Necrotizing Fasciitis
  – Peritonitis
  – Osteomyelitis
  – Septic Arthritis
  – Toxic Shock Syndrome
  – Post-partum Sepsis (i.e. puerperal fever)
Overview of Invasive GAS in MA

Photo Source: http://go2.guide/massachusetts-regions-map/
Confirmed Invasive GAS Cases by Year
Confirmed Invasive GAS Cases by Gender and Year

![Graph showing confirmed invasive GAS cases by gender and year from 2000 to 2017. The graph includes data for both female and male cases, with fluctuations over the years.]
# Confirmed Invasive GAS Cases by County

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Confirmed Invasive GAS Cases by IDU Status

Total reported invasive GAS cases in MA, by IDU status

* Data as of 30OCT17 and are subject to change.
Timeline of Invasive GAS Reporting

1993
• Classified as an “Emerging Infection” by CSTE

1995
• Classified as a national notifiable disease by CSTE

2003
• Became an immediately reportable disease in MA
Steps in Case Investigation
Which cases do we investigate?

• All reports of GAS isolated from a sterile site AND:
  
  – GAS isolated from a wound where necrotizing fasciitis is present
  
  – Invasive GAS from a woman during the post-partum period
    • This includes all inpatient days through 7 days after discharge
  
  – GAS isolated from a surgical wound or sterile site of a surgical patient within 7 days of surgery
  
  – Toxic shock syndrome with GAS isolated from ANY site
What are the goals of Invasive GAS investigations?

• Public health response varies based on situation
  – Schools, daycare centers, households, long term care facilities, hospitals
  – Post-partum, post-surgical, varicella

• For clusters/outbreak situations we want to stop any ongoing transmission and identify and eliminate a reservoir if it exists (i.e. eliminating carriage)

• Control measures may include culturing of healthcare workers and other exposed individuals, exclusion criteria, chemoprophylaxis, treatment, & environmental cleaning
Initiating an Investigation

- All suspect invasive GAS infections are reported via electronic laboratory reporting (ELR) or by phone to the Epidemiology Program.

- Once a MAVEN event is created, the Epidemiologist of the Day (EOD) will review the case to determine if it is an invasive infection and notify the LBOH if indicated.
  - Some or all of the follow-up may be delegated to the LBOH if their resources are adequate.
  - However, the Epi Program will usually coordinate investigations of post-partum or post-surgical cases or other clusters of invasive GAS disease.
MAVEN Clinical Practitioner Module

- Project where infection preventionists (IP) have access to MAVEN and complete the question packages in real time
  - Helps facilitate easier exchange of information
  - Only a handful of facilities are currently participating at this time

- Epis will review the question packages completed by the IPs

- If further public health intervention is necessary (such as the case is employed at a school or daycare or has close contacts) Epis will reach out to the LBOH for assistance
• Participating facilities:
  – Boston Medical Center
  – Brigham and Women’s Hospital
  – Lowell General Hospital
  – Massachusetts General Hospital
  – Milford Regional Medical Center
  – South Coast Health
    • St Luke’s Hospital
    • Charlton Memorial Hospital
    • Tobey Hospital
Routine Invasive GAS Investigations
Steps in the Investigation

• Complete demographic, clinical, and risk question packages in MAVEN

• **Be sure to ask the following questions:**
  – Did the GAS infection occur after a surgical procedure or post-partum?
  – Is the case an attendee or employed at a school or daycare?
  – Is the case a resident at or employed by a long-term care facility?
  – Did the case inject drugs not prescribed by a doctor during the incubation period (2 weeks?)

• *If the answer to any of these questions is “Yes” please call and notify the Epi assigned to the case*
Public Health Recommendations

• If Case is **NOT** a student, daycare or LTC facility attendee, or is **NOT** employed at a school, daycare center or LTC facility, and disease did **NOT** occur post-partum or post-operatively
  – Recommend that HCPs inform all household contacts about the clinical manifestations of pharyngeal and invasive GAS (fever, sore throat, localized muscle pain) and the importance of seeking immediate medical attention, if such symptoms occur
  – Recommend that household contacts *with* symptoms indicative of a GAS infection be tested and treated, if positive
Public Health Recommendations (Continued)

- If Case is **NOT** a student, daycare or LTC facility attendee, or is **NOT** employed at a school, daycare center or LTC facility, and disease did **NOT** occur post-partum or post-operatively
  - Recommend that the HCP *consider* offering chemoprophylaxis to non-symptomatic household contacts aged 65 years or greater
    - If providers prescribe chemoprophylaxis to an elderly or high-risk household member, then all members of the household should receive chemoprophylaxis
    - *No controlled trials have evaluated the effectiveness of chemoprophylaxis in preventing cases among close contacts*
  - Recommend heightened surveillance for additional invasive or non-invasive cases within the household cases for 30 days
Public Health Recommendations (Continued)

Streptococcal Pharyngitis

Viral Pharyngitis

Original image by James Heilman, MD / CC BY-SA 3.0

Original image Dake~commonswiki / CC BY-SA 2.5

Photo Source:
https://i.ytimg.com/vi/CoBJ6pDCLKI/maxresdefault.jpg
Investigating GAS Infections in Schools/Daycares
Invasive GAS in School Setting

• If Case is employed by or attends a school
  – Recommend remaining staff and attendees in the facility who have symptoms consistent with GAS infection be tested and treated, if positive
    • School health manual provides a sample letter for schools to use
  – Review and enhance environmental cleaning procedures with facility
Invasive GAS in Daycare Setting

- **If Case IS employed by or attends a daycare**
  - Ask if there are any cases of varicella or other cases of invasive GAS occurring among staff or attendees in the previous 2 weeks

- **Typically there are no cases of varicella or additional invasive GAS cases among staff or attendees**

  - Public health recommendations:
    - Discuss with household contacts the clinical manifestations of pharyngeal and invasive GAS and the importance of seeking immediate medical attention, if such symptoms occur
    - Recommend that household contacts with symptoms indicative of a GAS infection be tested and treated, if positive
    - Recommend that non-symptomatic household contacts aged 65 years or greater discuss with their provider whether they should receive chemoprophylaxis
    - Recommend heightened surveillance for additional invasive or non-invasive cases within the household cases for 30 days
Invasive GAS in Daycare Setting (Continued)

• In the event that a LBOH learns of varicella infection(s) or additional invasive GAS case(s), they should notify the Epi assigned to the case to discuss further follow up procedures.

Photo Source:
https://www.rch.org.au/uploadedImages/Main/Content/kidsinfo/RCH-KHI-Chickenpox-lge.jpg
Investigating GAS Infections in Long Term Care Facilities (LTCF)
Invasive GAS in LTCF

- 1 case of invasive GAS in LTCF
  - Epi or LBOH contacts the LTCF to ask if there have been additional cases of invasive or non-invasive GAS in the facility (among other residents or staff)
  - Recommend retrospective review of medical charts and lab results to determine if there have been any other cases of invasive or non-invasive GAS infection among residents or staff (providing direct patient care) within the previous 6 months

- Provide facility with MDPH LTCF GAS Memo
• **1 case of invasive GAS in LTCF**
  – If any staff or residents have symptoms such as sore throat, tonsillar inflammation, cervical lymphadenopathy or skin infections including pyoderma and impetigo, then obtain appropriate cultures
  – If any cultures are positive then treat as appropriate or prescribed by a health care professional
  – Recommend enhanced surveillance for next 6 months
  – Reinforce rigorous hand washing
• 2 or more cases of invasive GAS in a LTCF within 6 months
  – Intensive follow up handled by Epis with the help of LBOH
  – Consists of identifying the exposed group (both residents and HCWs) and screening those exposed regardless of symptom status
  – Positive cultures should be treated appropriately
  – Staff members with indistinguishable PFGE results should continue treatment and follow-up cultures should be obtained 7-10 days after completion of therapy
Invasive GAS in LTCF (Continued)

• If follow-up cultures in staff members with indistinguishable PFGE results remain positive after completion of therapy, Epis may ask for LBOH assistance in culturing household contacts of the colonized staff member.

Photo Source: https://www.wadsworth.org/sites/default/files/WebImage/694814150/PFGE%20gel%20picture.jpg
Investigating GAS Infections in Acute Care (Hospitals)
Invasive GAS in Acute Care

• Post-partum or post-surgical invasive GAS infections
  – HCWs can shed bacteria anally, vaginally, or from the respiratory tract
  • This can occur in both symptomatic HCWs (i.e. strep throat infection) or in colonized HCWs

Photo Source:

© Can Stock Photo - csp17017315
Invasive GAS in Acute Care (Continued)

• Follow up is coordinated by an Epi and infection preventionists at the facility
  – Investigative efforts focus on identifying a source and/or eliminating carriage
  – This is accomplished through targeted screening of shared HCWs when cases are identified
GAS Resources for LBOHs
Resources for LBOHs

• CDC Group A Streptococcal (GAS) Disease

• MDPH group A streptococcal fact sheet
  – http://www.mass.gov/eohhs/docs/dph/cdc/factsheets/g-i/group-a-strep.pdf

• MDPH is updating the GAS chapter in The Guide to Surveillance Manual for LBOHs
  – Available before the end of the year!

• MDPH LTCF Memo
  – All LBOHs should have received this memo in October

• School health manual
Questions?