

# Group A Streptococcus Outbreak Investigation in a Long-Term Care Facility, Virginia, 2023

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# Background



#### **Group A Strep**

- Streptococcus pyogenes, or Group A Strep (GAS), is a common cause of mild non-invasive infections like pharyngitis, cellulitis, and impetigo
- Invasive infections (iGAS) range from septicemia, streptococcal toxic shock syndrome (STSS), and necrotizing fasciitis
- Long-term care facilities (LTCFs) are the most burdened with adverse outcomes and death
  - Older adults have an increased risk for infection, severe disease, and death



### **Initial Notification**

- March 30, 2022: Local hospital reported a case of iGAS in a resident from a skilled nursing facility
- Facility was contacted and provided infection control guidance
  - Facility Infection Preventionist (IP) was not aware of this case or additional cases among staff or residents
  - Health district recommended retrospective review of records and active surveillance to identify additional cases
- April 4, 2022: Facility collected wound cultures on 2 residents that resulted positive for GAS and identified a nurse that tested positive for strep throat



## The Facility

- Large four-unit, permitted for more than 150 beds, skilled nursing facility
  - Provides skilled nursing, long-term care, shortterm rehabilitation, and memory care
- Facility recently changed ownership and utilized a large amount of agency staff
- Existing, positive relationship between facility and health district epidemiology staff





# Methods



### **Epidemiologic Investigation**

- Cases were identified through:
  - Active surveillance
  - o Retrospective chart review
  - Colonization screenings
- Multiple onsite infection prevention and control (IPC) assessments were conducted
- Genotyping analysis was preformed on available isolates throughout outbreak



#### **Case Definition**



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- A resident of staff member of the facility
- Onset of symptoms or positive test collected in March 2022 or later
- One of the following:
  - o Invasive: GAS isolated from normally sterile site
  - Serious noninvasive: GAS isolated from wound/cellulitis, urine, or respiratory secretions
  - Noninvasive: GAS isolated or detected by rapid antigen from the throat or a clinical diagnosis of strep throat from a healthcare provider



### **Case Identification**

- Retrospective review
  - Chart review of resident infection status, wound care notes, and hospitalizations from 1 month prior
  - Employee illness reports and call outs from 1 month prior
- Active Surveillance
  - Daily survey for symptoms of GAS infection for residents and staff included: sore throat, fever, new or worsening wounds, decubitus ulcer, cellulitis, other skin/soft tissue infection, altered mental status, and unusual fatigue
  - Anyone with symptoms of GAS infection were recommended to obtain medical assessment and test via culture



## Genotyping

- Whole genome sequencing (WGS) was conducted at the state lab on:
  - Positive specimens from colonization screenings tested at the state lab
  - iGAS isolates forwarded from private labs per state regulations
  - Any noninvasive GAS isolates from private labs available for forwarding to the state lab
- Genotyping used to help determine transmission patterns by identifying genetic relationships





# Results

#### **Case Characteristics**

Characteristic	Residents	Staff
Total Cases	33	16
Classification (n, %)	Invasive: 5, 15.15% Serious Noninvasive: 16, 48.48% Noninvasive: 12, 36.36%	Invasive: 0, 0% Serious Noninvasive: 1, 6.25% Noninvasive: 15, 93.75%
Median Age	80 years old	31 years old
Sex (n, %)	Female: 18, 54.5% Male: 15, 45.5%	Female: 15, 93.75% Male: 1, 6.25%
Facility Location (n, %)	Wing 1: 23, 69.7% Wing 3: 10, 30.3%	Nursing (CNA, RN, LPN): 12, 75% Therapy: 1, 6.25% Business Office: 1, 6.25% Kitchen: 1, 6.25% Social Services: 1, 6.25%
Death (n, %)	12, 36.4%	0, 0%
Tested positive again (after receiving treatment for initial positive test result)	3	1



**Date of Case Onset** 

## **Colonization Screenings**

- From March 2022 July 2023, 5 screenings were conducted
  - 2 facility wide
  - 2 targeted wings
  - o 1 staff
- 261 residents screened

   16 positive (6.1%)
- 200 staff screened
   6 positive (3%)

GAS Cases by Screening

Resident Staff

14





## Genotyping

- WGS was conducted on 37 isolates
- 35 isolates sequenced were emm89
  - Isolates were within <10 single nucleotide polymorphisms (SNP)
  - Appear to be highly genetically related and more likely to have come from a common source
- 2 staff specimens were emm1 and emm73
  - Appear to be genetically distinct and unlikely to have come from a common source





### **IPC Findings**







- Identified gaps in infection control
  - Hand hygiene
  - $_{\circ}$  Wound care
  - Resident care items
  - Transmission-based precautions
  - PPE use
  - Environmental cleaning and disinfection

• Education and training sessions were conducted with facility staff as a result of IPC findings



# Discussion



## Findings

- Antimicrobial susceptibility pattern elucidated pan sensitive organism
- WGS indicates a common source with continued person-to-person transmission due to lapses in IPC practices
- More cases identified despite multi-pronged interventions
- Mass chemoprophylaxis was considered, but not recommended
  - Participation from all staff and residents unlikely
  - Frequent staff turnover and use of temporary agency staff





### Challenges

- Frequent turnover of Infection Preventionist and other management positions at facility
- Staffing shortages in nursing and utilization of large percentage of agency staff
- Multiple concurrent COVID-19 outbreaks during this timeframe
- State lab does not preform "test of cure", so facility responsible for rescreening positive cases
- Noncompliance with infection control recommendations



#### Limitations

- Facility-wide carriage screenings did not include all staff
- Not all positive specimens available for WGS
- Colonization rate among staff was low
  - Only throat specimens collected and research shows GAS carriage from other sites can lead to transmission
  - Staff sometimes screened each other which might have introduced bias
- Rescreening was not done in recommended timeframe or at all
- The role of chemoprophylaxis was not evaluated



#### Conclusion

- WGS suggested a common source exposure with continuous person-toperson transmission in this prolonged GAS outbreak at a large SNF facility
- Despite multipronged interventions, new cases continued to be identified due to facility challenges and lapses in IPC practices
- Review of epidemiological data, frequent onsite infection prevention assessments, numerous educational sessions, multiple point prevalence surveys with targeted chemoprophylaxis and active follow-up with the facility were all crucial strategies for outbreak mitigation

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# **Questions?**