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To help infection preventionists quickly activate iGAS prevention efforts, APIC’s Emerging Infectious Diseases Task Force has created an **iGAS Playbook** that IPs can download and customize for use in their facilities. The Playbook is a concise workflow document that is designed to be user-friendly and operational for busy IPs.

Playbook: *Streptococcus pyogenes*

Acronym GAS, or Group A Strep is commonly used

There are anecdotal reports of potentially increasing number of invasive streptococcal disease resulting in Streptococcal Toxic Shock Syndrome (STSS) and Necrotizing Soft Tissue Infection (NSTI), also known necrotizing fasciitis, cases.

Risk/Triage Scale – Level 1: Recommend situation awareness

CDC is looking into an increase of invasive group A Strep (iGAS) infections [(CDC, February 2, 2023)](https://www.cdc.gov/groupastrep/igas-infections-investigation.html).

* Several children’s hospitals are reporting increasing iGAS infections, including some resulting in mortality [(CDC, February 2, 2023).](https://www.cdc.gov/groupastrep/igas-infections-investigation.html)

Prioritized Audiences – Hospitals (children, teaching, and community), ambulatory care, outpatient and clinics, psychiatric care, home health, and public health.

# Identification

## Screening Criteria

* 1. 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. [(CDC, April 16, 2021.)](https://ndc.services.cdc.gov/case-definitions/streptococcus-disease-invasive-group-a-1995/)
		1. Necrotizing fasciitis clinical features [(CDC, June 27, 2022)](https://www.cdc.gov/groupastrep/diseases-hcp/necrotizing-fasciitis.html), ([CDC April 16, 2021](https://ndc.services.cdc.gov/case-definitions/streptococcal-toxic-shock-syndrome-2010/)) with GAS laboratory confirmation from tissue specimens.
			1. Necrotizing fasciitis can affect any part of the body, but most commonly affects extremities, particularly the legs. Necrotizing fasciitis begins with pain in the affected area accompanied by the following signs:
				1. Swelling
				2. Erythema
				3. Tenderness
				4. Heat
				5. Swelling progresses to brawny edema and then to dark-red induration. Within 24 to 48 hours, the overlying skin may turn dusky, indicating small vessels in the dermal papilla have thrombosed.Cutaneous ischemia also develops.Bullae form and are filled with straw colored fluid that progressively turns to hemorrhagic fluid. Affected tissues progressively darken from red to purple to blue to black. As gangrene sets in, skin becomes anesthetized due to destruction of superficial nerves.
		2. STSS clinical case definition, with GAS laboratory confirmation from a normally sterile site [(CDC, June 27, 2022)](https://www.cdc.gov/groupastrep/diseases-hcp/Streptococcal-Toxic-Shock-Syndrome.html), ([CDC April 16, 2021](https://ndc.services.cdc.gov/case-definitions/streptococcal-toxic-shock-syndrome-2010/))
			1. Hypotension defined by a systolic blood pressure less than or equal to 90 mm Hg for adults or less than the fifth percentile by age for children aged less than 16 years.
			2. Multi-organ involvement characterized by two or more of the following:
				1. Renal impairment: Creatinine greater than or equal to 2 mg/dL (greater than or equal to 177 µmol/L) for adults or greater than or equal to twice the upper limit of normal for age. In patients with preexisting renal disease, a greater than twofold elevation over the baseline level.
				2. Coagulopathy: Platelets less than or equal to 100,000/mm3 (less than or equal to 100 x 106/L) or disseminated intravascular coagulation, defined by prolonged clotting times, low fibrinogen level, and the presence of fibrin degradation products.
				3. Liver involvement: Alanine aminotransferase, aspartate aminotransferase, or total bilirubin levels greater than or equal to twice the upper limit of normal for the patient’s age. In patients with preexisting liver disease, a greater than twofold increase over the baseline level.
				4. Acute respiratory distress syndrome: Defined by acute onset of diffuse pulmonary infiltrates and hypoxemia in the absence of cardiac failure or by evidence of diffuse capillary leak manifested by acute onset of generalized edema, or pleural or peritoneal effusions with hypoalbuminemia.
				5. A generalized erythematous macular rash that may desquamate.
				6. Soft-tissue necrosis, including necrotizing fasciitis or myositis, or gangrene.

## Travel Considerations

* 1. A travel history is important due to an overseas exposure and incubation period. The World Health Organization (WHO) is identifying an increase of GAS invasive diseases in several countries [(WHO, December 13, 2022)](https://www.who.int/europe/news/item/12-12-2022-increase-in-invasive-group-a-streptococcal-infections-among-children-in-europe--including-fatalities).
	2. Streptococcal disease is not listed on the CDC’s Travelers’ Health webpage. ([CDC, No Date](https://wwwnc.cdc.gov/travel/diseases))

## Exposure Definition

* 1. Prophylaxis discussion for exposure to GAS pneumonia, necrotizing fasciitis, STSS ([CDC, March 3, 2023)](https://www.cdc.gov/groupastrep/outbreaks.html)
	2. CDC does not recommend chemoprophylaxis or routine screening of household contacts of individuals with confirmed invasive group A streptococcal infections.Certain groups are at increased risk of sporadic invasive group A strep disease. In addition, people 65 years or older are at increased risk of death if they get an invasive infection. For this reason, healthcare providers may choose to offer chemoprophylaxis to all members of households of individuals with invasive group A strep infection with elderly household contacts or otherwise high-risk household contacts. [(CDC, June 27, 2022)](https://www.cdc.gov/groupastrep/diseases-hcp/necrotizing-fasciitis.html)

## Testing Information

* 1. Pharyngitis: Rapid antigen detection test (RADT) is a commonly used test. Throat culture is gold standard. [(CDC, June 27, 2022](https://www.cdc.gov/groupastrep/diseases-hcp/strep-throat.html))
	2. STSS: GAS is usually isolated from a normally sterile site e.g., blood, CSF, joint, etc. [(CDC, June 27, 2022)](https://www.cdc.gov/groupastrep/diseases-hcp/Streptococcal-Toxic-Shock-Syndrome.html)
	3. Necrotizing fasciitis: GAS is isolated from tissue or blood.

## Specimen Collection

* 1. Specimen collection is per the facility policy (e.g., blood cultures).

## Differentiation from Similar Diseases

* 1. Isolation of GAS by culture from a normally sterile site will differentiate from other infections. [(CDC, April 16, 2021)](https://ndc.services.cdc.gov/case-definitions/streptococcus-disease-invasive-group-a-1995/)

## Bioterrorism Threat

* 1. Naturally occurring; GAS is not identified as a bioterrorism agent. [(CDC, April 4, 2018)](https://emergency.cdc.gov/agent/agentlist-category.asp)

## Antimicrobial Resistance

* 1. Penicillin: No reports of GAS being resistant. [CDC, June 27, 2022](https://www.cdc.gov/groupastrep/diseases-hcp/strep-throat.html))
	2. Azithromycin, Clarithromycin: Reports of resistance have been identified. Consider this type of resistance for patients with a PCN allergy. [(CDC, June 27, 2022)](https://www.cdc.gov/groupastrep/diseases-hcp/strep-throat.html)

# Prevention of Transmission

## Precautions to Prevent Transmission

1. Good hand hygiene and respiratory etiquette are warranted; Standard precautions
	* 1. Transmission based precautions are indicated for certain presentations of GAS infections for hospitalized patients or residents in communal living arrangements. People with Group A strep pharyngitis or scarlet fever should stay home from work, school, or daycare until they are afebrile and 12 hours after starting appropriate antibiotic treatment. People with impetigo can return to normal activities after initiating antibiotics and the lesions are covered [(CDC, July 22, 2019)](https://www.cdc.gov/infectioncontrol/guidelines/isolation/index.html).

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| --- | --- | --- |
| Contact and droplet | Droplet  | Standard  |
| Major skin, wound, or burn | * Pharyngitis in infants and young children
* Pneumonia
* Scarlet fever in infants and young children
* Severe invasive disease
 | Minor skin, wound, or burn, or endometritis |
| Until drainage stops or is contained by dressing | Until 24 hours after initiation of effective treatment  |  |

## Personal Protective Equipment (PPE)

1. A surgical or procedure mask is indicated for droplet precautions. Use gloves and gowns for contact precautions if there are major skin, wound, or burn infections.

## Disinfection and Waste Considerations

1. Routine hospital grade disinfectants will suffice to disinfect shared equipment and inanimate objects. No special handling of regulated medical waste is indicated.
2. Environmental transmission may be possible, especially in outbreaks, but is not thought to be a common route of transmission [(CDC, March 3, 2023).](https://www.cdc.gov/groupastrep/index.html)
3. Individuals with GAS infections should not share items contaminated with saliva, such as water bottles or drinking glasses [(NCCID, No Date)](https://nccid.ca/debrief/group-a-streptococcus).

## Patient Transport

1. Follow precautions for droplet and contact as above.

##  Air Handling

1. No special air handling is required, although crowded conditions such as in daycare or the military may facilitate transmission [(CDC, June 27, 2022).](https://www.cdc.gov/groupastrep/diseases-hcp/strep-throat.html)

## Exposure Monitoring

1. Household contacts, especially those > 65 years of age or with certain risk factors. Prophylaxis may be indicated for postpartum or post-surgical patients exposed to an index case of GAS [(CID, October 15, 2002).](https://academic.oup.com/cid/article/35/8/950/330363)

## Census Tracking

1. Helpful to trend census, particularly children, to understand resources needed.

# Providing Patient Care

## High-Risk Procedures

1. Contact with oral and respiratory secretions, contact with draining wounds.

## Facility Operations

* 1. Follow facility processes for departments such as linen and laundry, dietary, and medical gasses.

## Visitation Management

1. Follow facility processes.

## Infection Prevention Staffing Considerations

1. Follow facility processes.

## Postmortem

1. Follow facility processes.

# Patient Discharge

## Communication Considerations

1. Notify appropriate local or state public health departments as soon as possible about unusually aggressive or severe iGAS cases affecting children younger than 18 years of age or clusters of iGAS infections in persons of any age [(CDC, February 2, 2023).](https://www.cdc.gov/groupastrep/igas-infections-investigation.html)
2. Provide clinical update per facility policy.

## Patient Discharge Information

1. The spread of group A strep can be reduced by standard infection control practices, including good hand hygiene and respiratory etiquette (e.g., covering your cough or sneeze) [(CDC, February 2, 2023).](https://www.cdc.gov/groupastrep/igas-infections-investigation.html) Refer to:
	* 1. Hand Hygiene Frequently Asked Questions [(CDC, November 4, 2022).](https://www.cdc.gov/handwashing/faqs.html)
		2. Respiratory Hygiene Resources [(CDC, August 26, 2021).](https://www.cdc.gov/flu/prevent/actions-prevent-flu.htm)
2. Screening and antibiotic prophylaxis for household contacts of iGAS patients is not recommended for household members under age 65 years, as the risk of secondary cases in these individuals is low. However, the risk of a secondary case in the 30 days following exposure to the index case is highest among household contacts who are 65 years of age or older, and thus, antibiotic chemoprophylaxis should be considered for household contacts over 65 [(CDC, February 2, 2023).](https://www.cdc.gov/groupastrep/igas-infections-investigation.html)
3. Patient Discharge Education
	* 1. Learn about the symptoms for [necrotizing fasciitis](https://www.cdc.gov/groupastrep/diseases-public/necrotizing-fasciitis.html), [streptococcal toxic shock syndrome](https://www.cdc.gov/groupastrep/diseases-public/streptococcal-toxic-shock-syndrome.html), and [cellulitis](https://www.cdc.gov/groupastrep/diseases-public/cellulitis.html) [(CDC, February 2, 2023).](https://www.cdc.gov/groupastrep/igas-infections-investigation.html)
		2. Seek medical care quickly if it’s believed that the individual or a household contact has one of these infections [(CDC, February 2, 2023).](https://www.cdc.gov/groupastrep/igas-infections-investigation.html)
		3. Make sure everyone in the household is up to date with flu and chickenpox vaccines, since getting these infections can increase risk for getting an iGAS infection [(CDC, February 2, 2023).](https://www.cdc.gov/groupastrep/igas-infections-investigation.html)

# Occupational Health

## Occupational Exposure Definition

1. Work with local health department for a location-specific definition. Potential exposure definitions to consider:
	* 1. Unprotected exposure or contact with infected wounds, blood, or respiratory droplets of a confirmed iGAS case. Unprotected exposure is defined as without proper personal protective equipment (gown, gloves, and mask) and ineffective hand hygiene while performing patient care. Exposure can be confirmed after identifying employee activity and PPE use during patient care.

## Pre- and Post-Exposure Information

1. Post-exposure prophylaxis is not necessary for healthcare personnel who have an exposure to group A *Streptococcus* [(CDC, November 22, 2022).](https://www.cdc.gov/infectioncontrol/guidelines/healthcare-personnel/selected-infections/group-a-strep.html#print)
2. For healthcare personnel with group A *Streptococcus* colonization who are epidemiologically linked to transmission of the organism in the healthcare setting:
	* 1. Administer chemoprophylaxis in accordance with CDC recommendations AND
		2. Exclude from work until 24 hours after the start of effective antimicrobial therapy AND
		3. Obtain a sample from the affected site for group A *Streptococcus* testing 7 to 10 days after completion of chemoprophylaxis; if positive, repeat administration of chemoprophylaxis and again exclude from work until 24 hours after the start of effective antimicrobial therapy [(CDC, November 22, 2022).](https://www.cdc.gov/infectioncontrol/guidelines/healthcare-personnel/selected-infections/group-a-strep.html#print)

## Employee Furlough

1. Work restrictions are not necessary for healthcare personnel who have an exposure to group A *Streptococcus* [(CDC, November 22, 2022).](https://www.cdc.gov/infectioncontrol/guidelines/healthcare-personnel/selected-infections/group-a-strep.html#print)

## Return to Work Guidance

1. Work restrictions are not necessary for healthcare personnel with known or suspected group A *Streptococcus* colonization, unless they are epidemiologically linked to transmission of the organism in the healthcare setting [(CDC, November 22, 2022).](https://www.cdc.gov/infectioncontrol/guidelines/healthcare-personnel/selected-infections/group-a-strep.html#print)
2. For healthcare personnel with known or suspected group A *Streptococcus* infection, obtain a sample from the infected site, if possible, for group A *Streptococcus* and exclude from work until group A *Streptococcus* infection is ruled out, or until 24 hours after the start of effective antimicrobial therapy, provided that any draining skin lesions can be adequately contained and covered [(CDC, November 22, 2022).](https://www.cdc.gov/infectioncontrol/guidelines/healthcare-personnel/selected-infections/group-a-strep.html#print)
3. For draining skin lesions that cannot be adequately contained or covered (e.g., on the face, neck, hands, wrists), exclude from work until the lesions are no longer draining [(CDC, November 22, 2022).](https://www.cdc.gov/infectioncontrol/guidelines/healthcare-personnel/selected-infections/group-a-strep.html#print)

## Contract Tracing

1. See exposure definition above. Work with local health department.

## High-Risk Employees

1. None identified.

# Outreach Considerations for Healthcare Stakeholders

## Messaging for Senior Leadership

* 1. Resources required
		1. Consider how to escalate resource request to senior leaders/supervisor.
	2. Impact to business continuity
		1. Anticipate how iGAS may impact daily operations and communicate to senior leadership/supervisor.

## Marketing and Communications

* 1. Media management planning
		1. Ensure public information officer (PIO) is updated regularly. If no PIO has been identified, assign. This person is typically responsible for representing the facility during interviews, and media information requests.
	2. Communication for hospital staff, and physicians
		1. Consider how staff and physicians prefer communication.
		2. Create a dated template so team becomes familiar with update format.
		3. Consider how often staff and physicians want to be updated.
		4. Consider updates for patients, especially as guidance is updated.

## Public Health

* 1. Case reporting requirements
		1. Connect with local public health to understand what elements are required within reports, and how often information should be reported.
	2. Case testing
		1. Connect with local public health to understand testing criteria, and if permission must be granted for testing. If permission is not required, public health may require notification for testing.
	3. Patient transfer
		1. Connect with local public health to understand what reporting is needed prior to patient transfer or discharge.
	4. Exposure communication
		1. Connect with local public health to understand reporting requirements for healthcare worker, patient, or visitor exposure.

## Pharmacy

* 1. Prophylaxis procurement
		1. Connect with pharmacy to understand prophylaxis options.
		2. If local public health distributes prophylaxis, understand criteria required for prophylaxis release.
	2. Vaccine procurement
		1. Connect with pharmacy to understand vaccine options.
		2. If local public health distributes vaccine, understand criteria required for vaccine release.
	3. Treatment requirements
		1. Connect with pharmacy to understand treatment options.
		2. If local public health distributes treatment, understand criteria required for treatment release.

## Partnering Laboratories

* 1. Testing methodologies
		1. Connect with the laboratory to understand available testing methodologies, and what supplies are required.
		2. See “Public Health” above if local public health is involved in testing.
	2. Testing procedure
		1. Connect with the laboratory to understand testing procedure.
		2. Include testing procedures in communication to clinical teams.
		3. See “Public Health” above if local public health is involved in testing.
	3. Specimen shipment
		1. Ensure the laboratory is aware of shipping requirements and has the supplies on hand for shipping requirements.
	4. Turnaround time for results
		1. Connect with the laboratory to understand testing turnaround times.
	5. Results reporting
		1. Connect with the laboratory to understand reporting workflow.
		2. Plan with whom, and how, the laboratory will communicate results. If testing is sent out, ensure a point of contact is named.

## Supply Chain

* 1. PPE days on hand reporting
		1. Connect with supply chain to identify key PPE to monitor regularly.
		2. Include senior leadership in communication.
		3. Identify reporting cadence.
	2. Contingency planning for PPE
		1. Identify thresholds to begin conservation and contingency plans.
		2. Provide PPE requirements so supply chain can identify back-up, alternate supplies in the case of shortage.
	3. Specific supply planning: conduct planning for
		1. Specimen collection supplies, test, and reagent supplies
		2. Cleaning supplies and disinfectants
	4. Patient care supply identification
		1. Identify suppliers for products such as ventilators.
		2. Identify suppliers for treatment or supportive care supplies.

For additional detail or more information see the Association for Processionals in Infection Control and Epidemiology [Text, Chapter 96: Streptococci](https://text.apic.org/toc/healthcare-associated-pathogens-and-diseases/streptococci), Revised November 3, 2022.