

Understanding Strep Infections



Disease Control Bureau
Youth Settings Program



Jennifer Cooper (she/her)

Public Health Nurse II



- Originally from Wisconsin, Jenny graduated from Marquette University with a bachelor's degree in history. Jenny has lived in Chicago for 20 years and earned her Master's degree in Nursing from DePaul University. She is currently studying for her Master's in Public Health.
- Before joining CDPH, Jenny spent 10 years working as a school nurse, where she worked with children from 15 months old through high school. During her time working in schools, she cared for sick and injured children and staff, created health plans, provided staff education, and responded to disease outbreaks, including Covid-19.
- Any questions related to this presentation?
 - Reach out to SchoolsCD@cityofchicago.org!



MISSION AND VISION

- Our purpose is to work with communities and partners to create an equitable, safe, resilient, and Healthy Chicago.
- The impact we seek is that everyone in Chicago thrives and achieves their optimal health and wellness.



CDPH



Goals of the Youth Settings Team

- To keep Chicago students and staff in school
- To keep Chicago students and staff healthy and free of communicable diseases
- To minimize burden on early childcare staff and school nurses





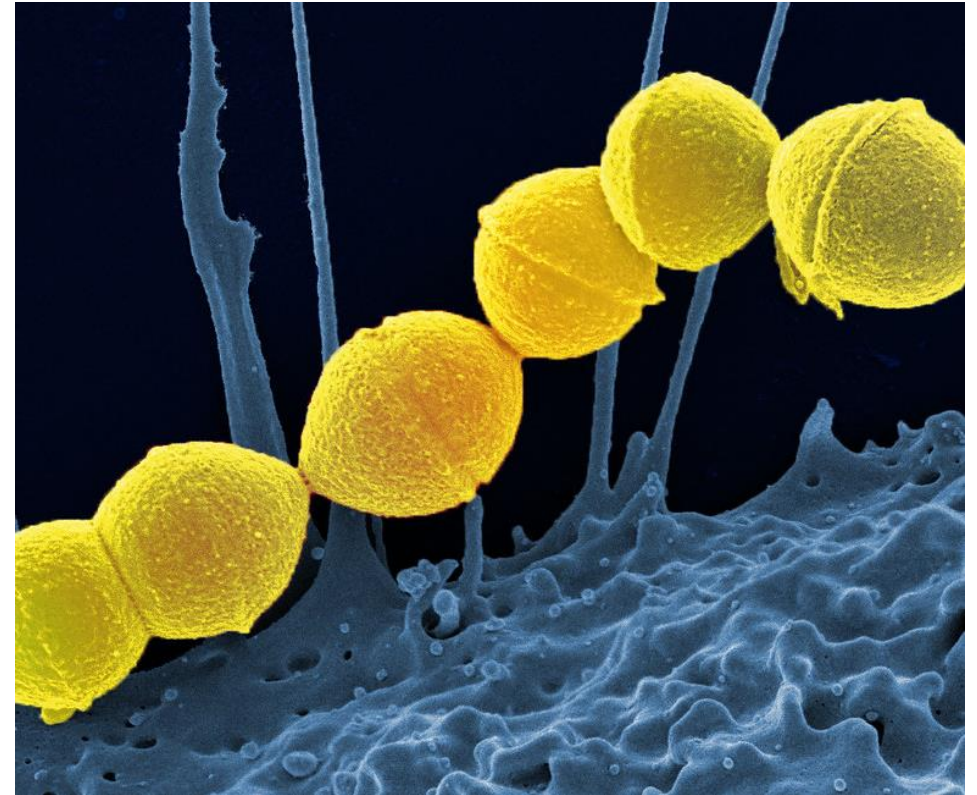
Objectives

- Explain the importance of preventing the spread of Group A Streptococcal infections
- List 2 potential complications of a Group A Streptococcal infection
- Identify 3 ways to help prevent the spread of Group A Streptococcal infections



★ Agenda

1. What is Group A Streptococcus?
2. Strep throat
3. Impetigo
4. Scarlet fever
5. Rheumatic fever
6. Invasive Group A Strep (iGAS)
 - Streptococcal toxic shock syndrome (STSS)
 - Necrotizing fasciitis
5. School and daycare response
6. Prevention





Group A Streptococcus

What is it?

- *Bacterium found on human throat or skin*
- *It can cause many different bacterial infections:*
 - Strep throat/Scarlet fever
 - Rheumatic fever
 - Impetigo
 - Cellulitis
 - Invasive Group A Strep infections:
 - Toxic Shock Syndrome
 - Necrotizing fasciitis

Why is it important?

- CDC estimates there are 25,000 cases of invasive group A strep disease every year
 - Between 1,500 and 2,300 people die annually due to invasive group A strep
 - Preliminary 2023 data indicates the number of severe infections from group A strep was at a 20-year high
- Prevent rheumatic fever
- Early recognition, diagnosis, and treatment can prevent severe infections



News / Increase in invasive Group A streptococcal infections among children in Europe, including fatalities



Increase in invasive Group A streptococcal infections among children in Europe, including fatalities

onals > Health Alert Network (HAN) > HAN Archive > 2022

Increase in Pediatric Invasive Group A Strep Infections

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Distributed via the CDC Health Alert Network

December 22, 2022, 1:45 PM ET

CDCHAN-00484

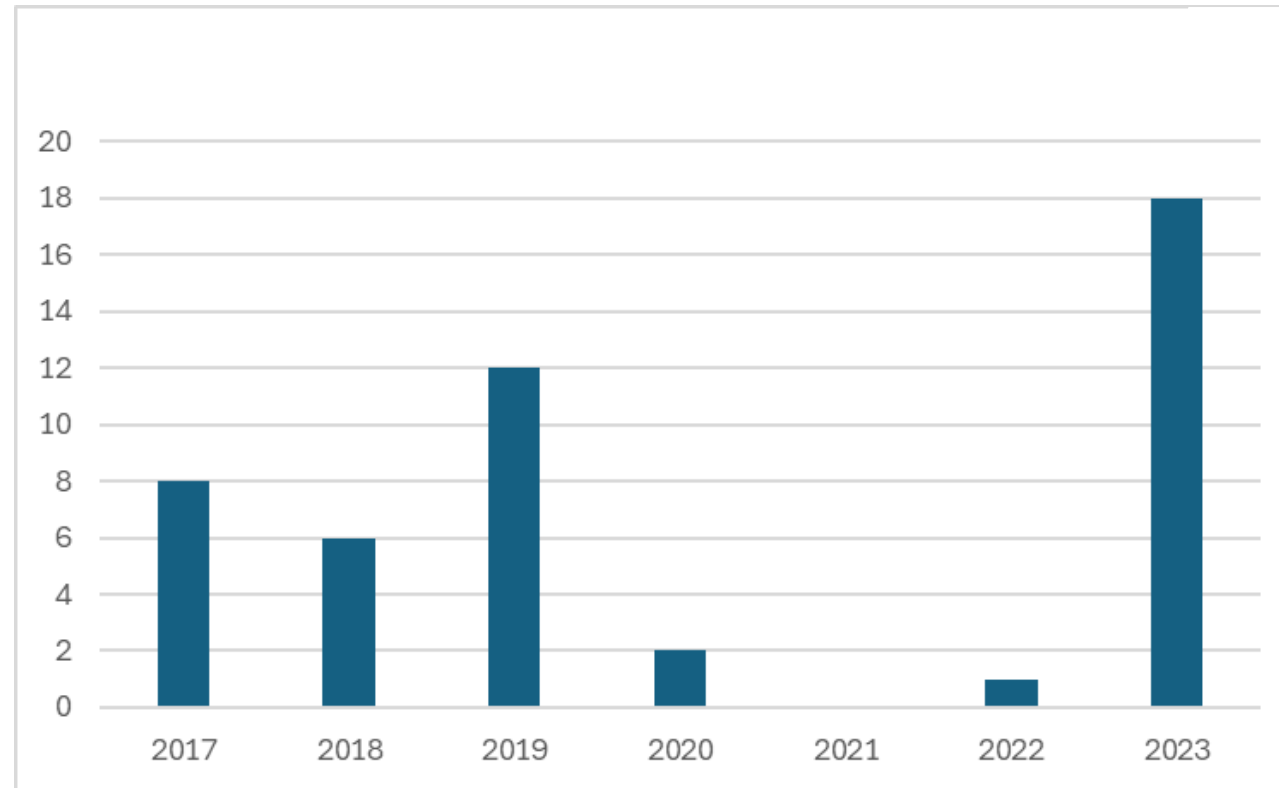
Summary

The Centers for Disease Control and Prevention (CDC) is issuing this Health Alert Network (HAN) Health Alert to clinicians and public health authorities of a recent increase in pediatric invasive group A streptococcal (iGAS) infections. On November 22, 2022, CDC was notified of a possible increase in iGAS infections among children at a hospital in Ohio. Potential increases in pediatric iGAS cases in other states were subsequently noted by contributors to the American Society of Diseases Society of America's provider-based [Emerging Infections Network](#) and by certain jurisdictions participating in CDC's [Active Bacterial Core Surveillance System \(ABCs\)](#). This increased number of pediatric iGAS cases has occurred in the setting of increased circulation of respiratory syncytial virus (RSV), influenza virus, and other respiratory viruses. While the overall number of cases has remained relatively low and iGAS is rare in children, CDC is investigating these reports.

This Health Advisory highlights the recent rise in iGAS infections in children, the increased seasonal variation in cases across all age groups, and the importance of early recognition, diagnosis, and appropriate treatment of these infections.

Chicago iGAS Cases in 0-18 year-olds

iGAS in Chicago, 2017-2023





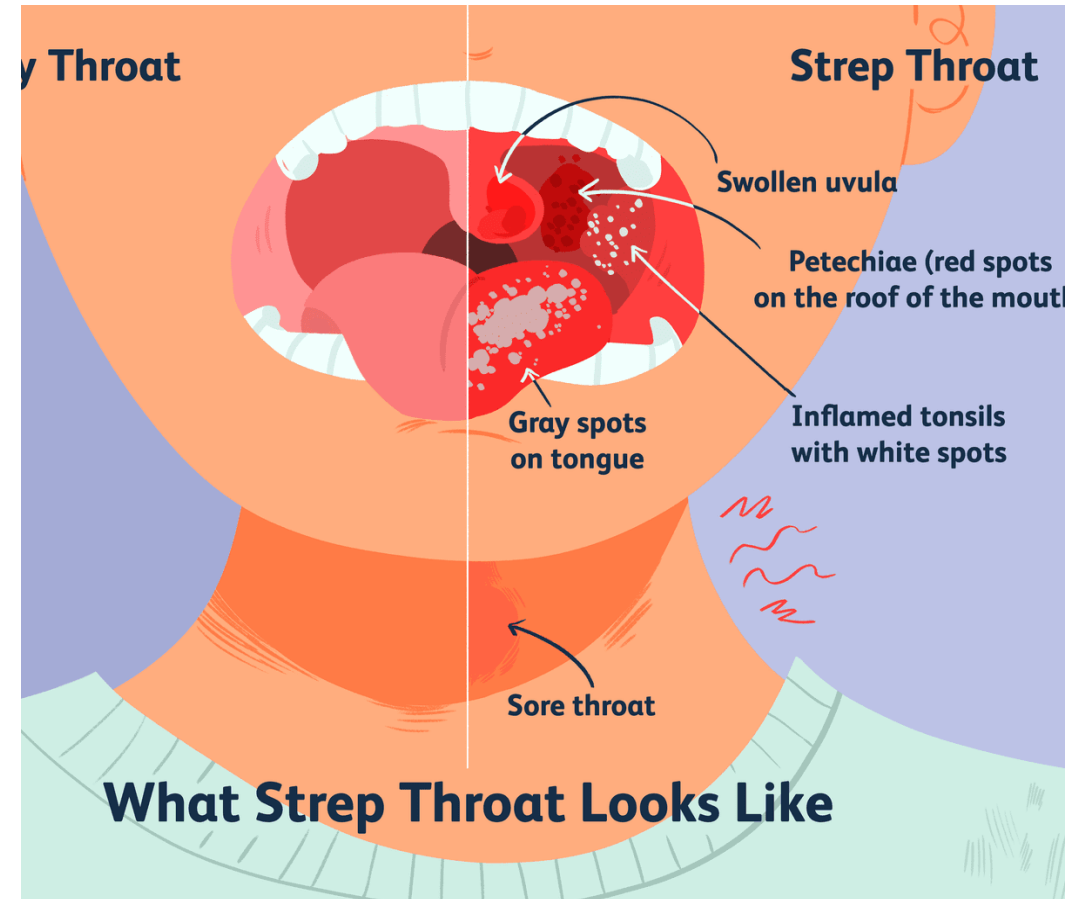
Strep Throat

What is it?

- Group A Streptococcus bacterial infection in the throat and tonsils

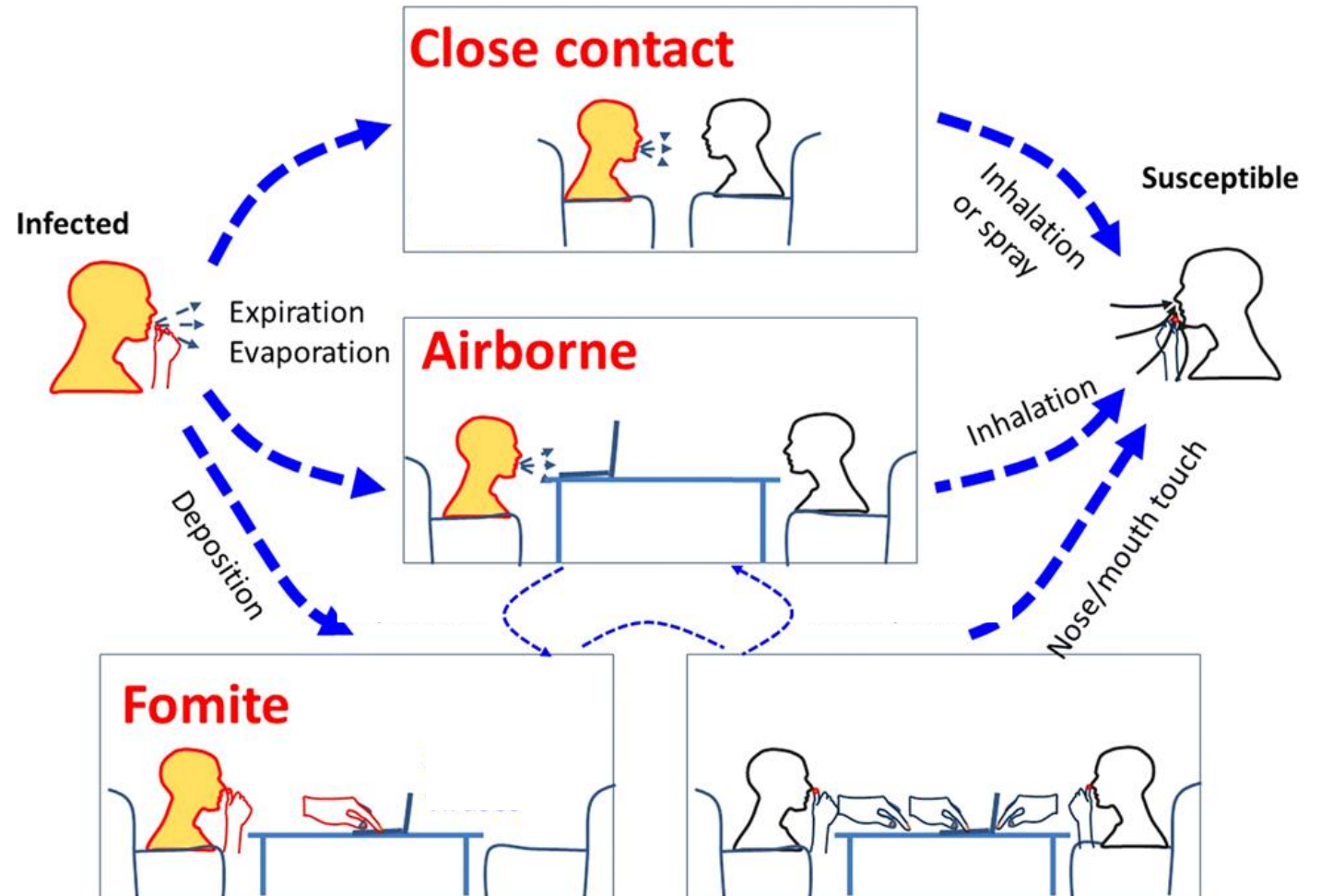
Signs and Symptoms

- Sudden high fever
- Sore throat
- Red throat with white patches
- Swollen lymph nodes in the neck
- Swollen tonsils
- Nausea, Vomiting



★ Strep Throat Transmission

- Close contact with those infected
- Spread through contact and respiratory droplets from coughing or sneezing
- Can be from contaminated surfaces



★ Strep Throat Diagnosis



Parent should provide note from a healthcare provider to return to daycare/school

- To diagnose strep throat, a healthcare provider may use either:
 - a rapid test (results in 15 minutes) or
 - a throat culture (results take 1-2 days)
- Scarlet fever diagnosis based on strep throat rapid test or culture along with physical exam
- Sore throats have many causes, often viral, not bacterial like strep throat



★ Strep Throat Treatment

- Antibiotics may need to be given for up to 10 days.
- **CHILDCARE SETTINGS:** Exclude until after 24 hours of antibiotics and fever-free for 24 hours
- **Schools:** Exclude until after 12 hours of antibiotics and fever-free for 24 hours
- Encourage children to avoid sharing drinks or utensils; exclude infected adults from food handling.



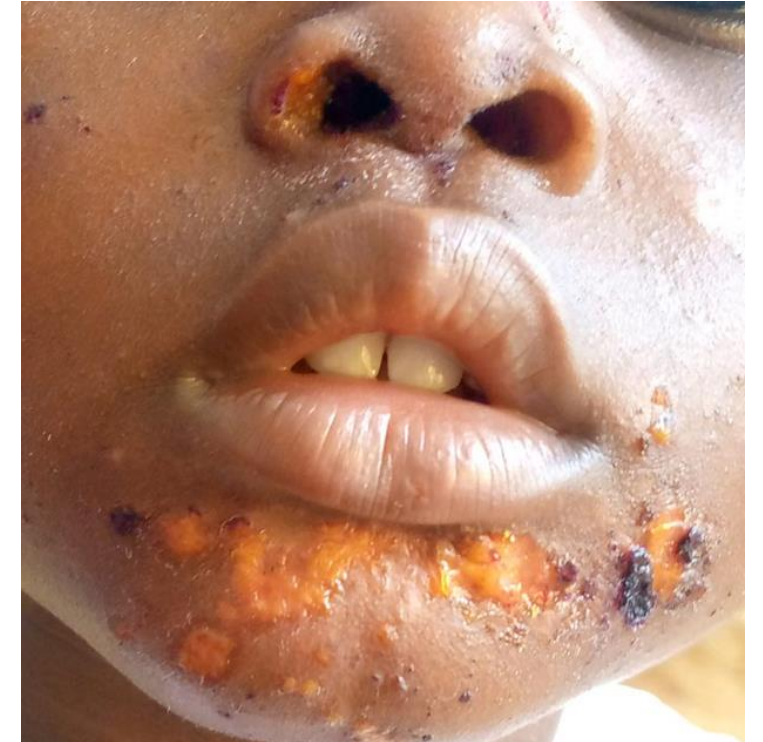
★ Impetigo

What is it?

- Bacterial skin infection caused by Staphylococcus or Streptococcus (Group A strep) bacteria
- Most common in young children (ages 2-5)
- People with scabies are at increased risk

Symptoms

- Small red pimples of fluid-filled blisters with crusted yellow (honey-colored) scabs
- Itching
- Most often on the face (around nose/mouth), but can appear anywhere on the body



★ Impetigo Transmission

Transmission

- Direct skin to skin contact (especially contaminated hands), nasal discharge, or contaminated surfaces
- Contact with fluid from the sores
- Contagious until crusting lesions are gone **OR** 24 hours of antibiotics

Diagnosis

- Typically diagnosed on physical exam, based on appearance
- Parent should provide note from healthcare provider

Treatment

- Oral or topical antibiotics, depending on severity
- Keep lesions covered where possible



★ Scarlet Fever

What is it?

- Usually occurs with strep throat infection or impetigo
- Group A strep bacteria release a toxin that causes the rash in scarlet fever

Signs and Symptoms

- Red, sore throat
- Fever
- Whitish coating on the tongue early in the illness
- “Strawberry” (red and bumpy) tongue
- Red skin rash that has a sandpaper feel
- Bright red skin in the creases of the underarm, elbow, and groin
- Redness may be less visible on darker skin, but will still have sandpaper feel

Transmission, diagnosis, and treatment will be the same as strep throat



On brown or black skin the rash is less visible but raised bumps can still be felt



A white coating on the tongue peels away leaving it red and swollen ('strawberry tongue')

Source: UKHSA (2023b); Herdman et al (2021); NHS (2021a)



★ Rheumatic Fever

What is it?

- Inflammatory condition that can affect the heart, joints, brain, and skin
- Can develop if a group A strep infection is left untreated (strep throat, scarlet fever, or impetigo)
- Occurs when immune system mistakenly attacks healthy parts of the body

Signs and Symptoms

- Fever
- Tender/painful joints
- Chest pain, shortness of breath, fast heartbeat
- Tiredness
- Jerky, uncontrollable body movements (chorea)





Rheumatic Fever

Transmission

- Rheumatic fever is NOT contagious
- If group A strep bacteria is still present, it can spread
- Symptoms begin 1-5 weeks after the infection

Diagnosis

- No single test
- Throat swab to check for bacteria
- Test for antibodies against strep
- EKG or echocardiogram to test heart function

Treatment

- Manage fever, pain, and inflammation
- Antibiotics
- If long term heart damage, may need related medication and treatment
- Depending on severity, may be on long-term antibiotics to prevent another group A strep infection



★ Invasive Group A Strep (iGAS) infections

Rare, life-threatening infection, caused when Group A strep bacteria enters a part of the body that is normally sterile (bacteria not usually found)

- Streptococcal Toxic Shock Syndrome (STSS)
- Necrotizing Fasciitis
- Others include:
 - Pneumonia
 - Meningitis (infection around the brain and spinal cord)
 - Septicaemia (blood infection)



★ Streptococcal Toxic Shock Syndrome

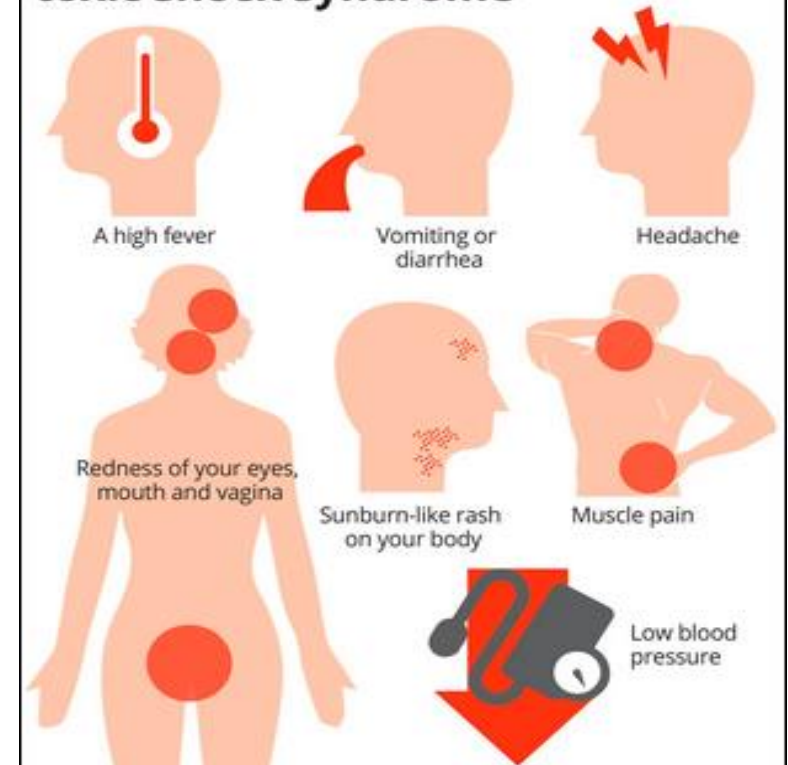
What is it?

- Rare but serious bacterial infection
- Caused when Group A strep bacteria enters body and spreads to deep tissues and blood stream. Toxins produced by bacteria induce shock and organ failure.

Signs and Symptoms

- **Early:**
 - Fever and chills
 - Muscle aches
 - Nausea and vomiting
 - Localized pain, swelling, and redness to skin (where infected)
- **24-48 hours later:**
 - Low blood pressure
 - Faster than normal heartbeat
 - Rapid breathing
 - Kidney or liver failure

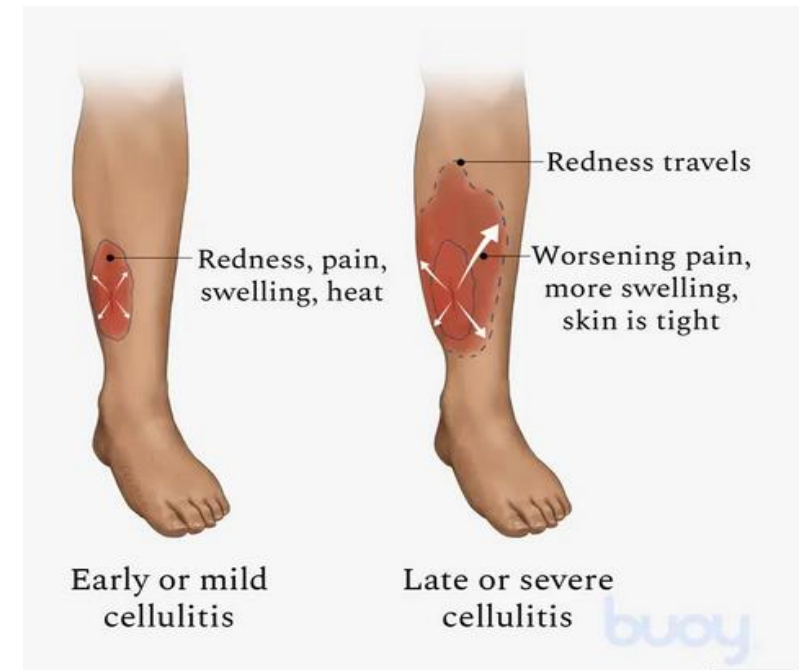
Possible signs and symptoms of toxic shock syndrome



★ Necrotizing Fasciitis and Cellulitis

What is it?

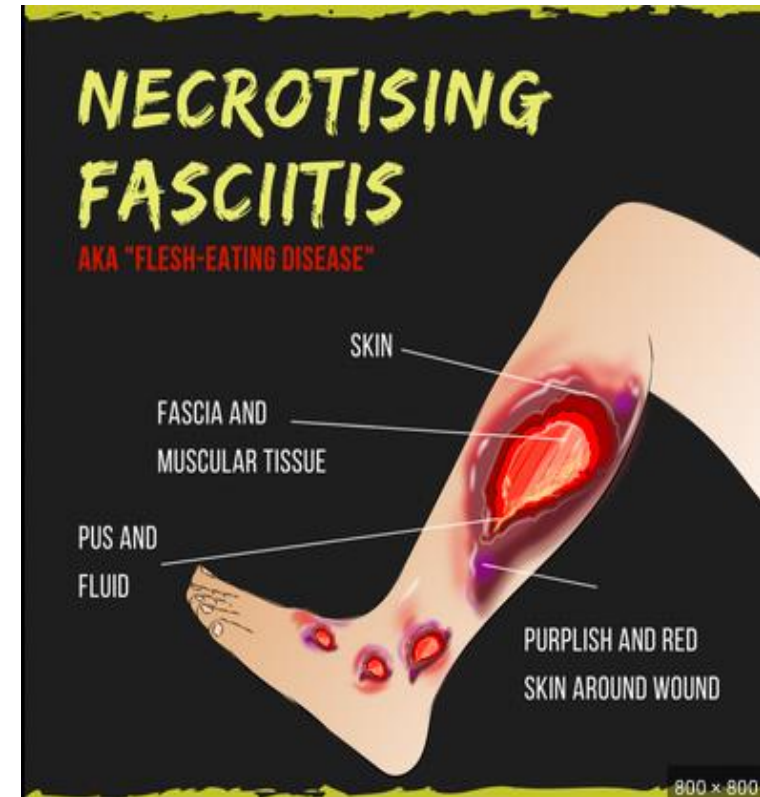
- **Cellulitis:**
 - Bacterial skin infection, most often caused by Group A Strep
 - If untreated, can turn into necrotizing fasciitis
- **Necrotizing fasciitis:**
 - Occurs when toxins released by the bacteria has caused muscle and subcutaneous tissue to die ('necrosis')
 - Serious and life-threatening infection
 - Spreads quickly in the body



★ Necrotizing Fasciitis

Signs and Symptoms

- **Early:**
 - Red, warm, or swollen area of skin that spreads quickly
 - Severe pain, including beyond the area of skin affected
 - Fever
- **Later:**
 - Ulcers, blisters, or black spots on the skin
 - Skin color changes
 - Pus or oozing from the infected area
 - Dizziness
 - Tiredness
 - Diarrhea or nausea



Up to 1 in 5 people with
necrotizing fasciitis die



★ Streptococcal Toxic Shock Syndrome (STSS) & Necrotizing Fasciitis

Transmission

- A complication of strep infection
- Rarely spread from person to person

Diagnosis

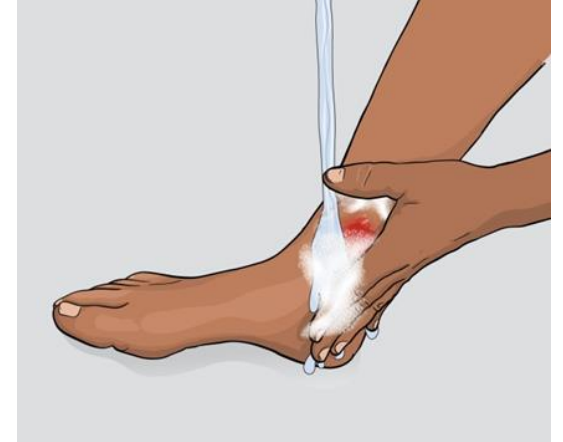
- Bloodwork
- Urine sample (STSS)
- Vaginal, cervix, throat swab (STSS)
- Biopsy and imaging (Necrotizing Fasciitis)

Treatment

- Antibiotics
- IV fluids
- Surgery to remove infected tissue



Wash hands often



Clean wounds



Bandage wounds



See a doctor for deep or serious wounds



Risk factors for developing an iGAS infection

Viral Infections

- Recent varicella (chicken pox) or flu infection

Medical Conditions

- Cancer
- Diabetes
- Chronic heart, kidney, or lung disease
- Immunocompromised
- Wound or skin breakdown



How should schools and daycares respond?

- Exclude sick person until fever-free for 24 hours AND
 - 24 hours of antibiotics in childcare settings
 - 12 hours of antibiotics in K-12 schools
- Encourage students and staff to avoid sharing drinks or utensils
- Any close contacts who develop symptoms should be tested, and if positive, treated. Symptoms include fever, sore throat, or new rash.
- Notify families in the classroom of any diagnosed cases
- Notify CDPH if there are 10 linked cases of strep throat/scarlet fever/impetigo within 10 days
- Notify CDPH if your facility has 2 cases of Invasive Group A Strep within 4 months





Additional strep throat infection prevention measures

- **REINFORCE GOOD HAND HYGIENE!**
- Encourage children and staff to cover coughs and sneezes with a tissue or in their elbow
- Encourage children and staff to be up to date on vaccinations (especially flu and chicken pox)
- Encourage parents to keep their children home when sick
- Follow a regular cleaning and disinfection schedule
- Keep wounds clean and watch for signs of infection
- Anyone with a fever and a red and painful wound should seek medical care





Group Discussion

- What are 3 things you can ensure your facility does to prevent the spread of Group A Strep infections?
- What are 2 possible complications of Group A Strep infections that we are trying to prevent?
 - Do you have anyone in your facility at high-risk of complications?
 - If so, how can you protect them?





Non-Invasive Strep Infections	Symptoms	Transmission	Prevention
Strep throat	-Sudden high fever -Sore throat -Red throat with white patches -Swollen tonsils -May have nausea/vomiting	-Close contact with infected persons -Spread through respiratory droplets via coughing/sneezing -Can be transmitted through surfaces	-Ensure diagnosed children and staff remain out until on antibiotics 24 hours -Requires a physician's note to return
Impetigo	-Small, red pimples of fluid-filled blisters with crusted yellow (honey-colored) scabs -Itching -Most often on the face around the nose/mouth	-Direct skin-to-skin contact -Nasal discharge -Contact with fluid from sores -Contaminated surfaces	-Ensure diagnosed children and staff remain out until on antibiotics 24 hours -Requires a physician's note to return
Scarlet fever	-Red, sore throat -Fever -Whitish coating on tongue turning into 'strawberry' tongue -Red skin rash that has sandpaper feel	-Close contact with infected persons -Spread through respiratory droplets via coughing/sneezing -Can be transmitted through surfaces	-Ensure diagnosed children and staff remain out until on antibiotics 24 hours -Requires a physician's note to return
Rheumatic fever	-Fever -Tender, painful joints -Chest pain, difficulty breathing, fast heartbeat -Tiredness -Jerky, uncontrollable movements	-NOT contagious	-Ensure children and staff diagnosed with strep throat, impetigo, and scarlet fever are cleared by a physician and prescribed antibiotics





Invasive Strep Infections	Symptoms	Transmission	Prevention
Streptococcal toxic shock syndrome	EARLY: -Fever and chills -Muscle aches -Nausea and vomiting -Localized pain, swelling, redness (where infected) 24-48 HOURS LATER: -Low blood pressure -Fast heartbeat -Rapid breathing -Organ failure	-NOT usually contagious -complication of strep infection	-Wash hands often -Clean and care for wounds -Take and complete course of antibiotics if prescribed
Necrotizing fasciitis	EARLY: -Red, warm, or swollen area of skin that spreads quickly -Severe pain, including beyond the affected area -Fever LATER: -Ulcers, blisters, or black spots on skin -Pus or oozing -Dizziness -Tiredness -Diarrhea or nausea	-NOT usually contagious -complication of strep infection	-Wash hands often -Clean and care for wounds -Avoid hot tubs, swimming pools, lakes, etc. if you have an open wound



★ Questions?





References & Resources

Center for Disease Control and Prevention: <https://www.cdc.gov/groupastrep/surveillance.html>

Center for Disease Control and Prevention: <https://www.cdc.gov/groupastrep/diseases-public/cellulitis.html>

Center for Disease Control and Prevention: <https://www.cdc.gov/groupastrep/diseases-public/impetigo.html>

Center for Disease Control and Prevention: <https://www.cdc.gov/groupastrep/diseases-public/necrotizing-fasciitis.html>

Center for Disease Control and Prevention: <https://www.cdc.gov/groupastrep/diseases-public/streptococcal-toxic-shock-syndrome.html>

DermNet Necrotizing Fasciitis: [Necrotising fasciitis images | DermNet \(dermnetnz.org\)](https://www.dermnetnz.org/necrotizing-fasciitis-images)

FDA Drug Shortages. (n.d.). [Www.accessdata.fda.gov.
https://www.accessdata.fda.gov/scripts/drugshortages/dsp_ActiveIngredientDetails.cfm?AI=Amoxicillin%20Oral%20Powder%20for%20Suspension&st=c](https://www.accessdata.fda.gov/scripts/drugshortages/dsp_ActiveIngredientDetails.cfm?AI=Amoxicillin%20Oral%20Powder%20for%20Suspension&st=c)

Mayo Clinic: <https://www.mayoclinic.org/diseases-conditions/mrsa/symptoms-causes/syc-20375336>

Sauve, L., Forrester, A. M., & Top, K. A. (2021). Group A streptococcal pharyngitis: A practical guide to diagnosis and treatment. *Paediatrics & Child Health*, 26(5), 319–319. <https://doi.org/10.1093/pch/pxab025>

United States Environmental Protection Agency: <https://www.epa.gov/pesticide-registration/list-h-registered-antimicrobial-products-label-claims-against-methicillin>





How to connect with CDPH

Contact CDPH School Team

(312) 746-6015

SchoolsCD@cityofchicago.org

To Report a Reportable Illness in Chicago

Call the CDPH Disease Reporting Line at (312) 743-9000 immediately during normal working hours.

After hours, weekends, and holidays, call 311 and ask for the communicable disease physician on-call.

- If you are calling from outside the City of Chicago 311 can be reached at 312-744-5000



Thank You!



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