Wisconsin Division of Public Health
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In this issue:

1. Strep pharyngitis: the facts, the myths and how to handle school "outbreaks"

Every winter the Communicable Diseases Epidemiology Section (CDES) receives many calls regarding what are thought to be outbreaks of "strep throat" in Wisconsin schools and childcare settings. Although seasonal illness clusters of strep throat are expected, they still prompt questions regarding outbreaks, exclusion, and the concern of multiple infections in an individual.

The "bug": Streptococcal pharyngitis ("strep throat") is caused by the bacteria *Streptococcus pyogenes*, also referred to as Group A beta-hemolytic streptococcus (GAS). There are over 130 serotypes of *Streptococcus pyogenes* causing different illnesses such as pharyngitis (sore throat), impetigo, acute rheumatic fever (ARF), acute glomerulonephritis and toxic shock syndrome. Strep pharyngitis can occur at any age, but is most common among children aged 5-15 years.

Transmission: Group A beta-hemolytic streptococci are usually transmitted through contact with an infected person's respiratory tract secretions. The incubation period for illness is typically 2-5 days, with transmission highest during acute infection. If untreated, the bacteria can be carried in the throat for weeks with the number of bacteria and transmission decreasing greatly after 2-3 weeks. Strep pharyngitis occurs year round but peaks during winter and spring.

While the family pet and toothbrushes are often accused of aiding transmission, the 2012 *Red Book* states, "Fomites and household pets, such as dogs, are not vectors of GAS infection." Transmission **is** associated with close person-to-person contact, such as that occurring in schools, child-care centers, contact sports and dormitory environments. Secondary rates of infection are approximately 25% among household contacts of a symptomatic case.

The vast majority of cases of strep pharyngitis would resolve without antibiotic treatment. However, antibiotic treatment of all laboratory confirmed cases is standard to greatly shorten the period of contagiousness, reduce transmission of GAS to family members, classmates and close contacts, improve clinical symptoms and prevent rare but serious sequelae (e.g., acute rheumatic fever).

Prevalence: In a meta-analysis of 14 studies, conducted by the National Institutes of Health, the estimated pooled prevalence of strep pharyngitis in non-outbreak situations was 37% among school-age children who presented to a doctor's office with a sore throat. The prevalence of GAS ranges from 10% to 14% in children less than 3 years of age with pharyngitis. Thus, the majority of cases of pharyngitis among children are caused by other etiologic agents (probably viral).

While strep pharyngitis rates are generally lower among adults (5-15%), rates are higher among parents of school-aged children and those in occupations involving close proximity to children. Acute strep pharyngitis is uncommon among children aged less than 3 years. Because of the lower rates among adults and children aged less than 3 years, and the extremely rare occurrence of rheumatic fever among these groups, diagnostic testing among these age groups is **not** recommended if individuals have symptoms more indicative of viral infection (e.g., cough, runny nose, congestion, hoarseness).

Signs and symptoms: Because there is broad overlap in the signs and symptoms of streptococcal and non-streptococcal (usually viral) pharyngitis, only a clinician using a laboratory test should diagnose a GAS infection. The ability to accurately diagnose streptococcal pharyngitis based on clinical signs and symptoms alone is generally low, even for the most experienced physicians.

Knowledge of the common signs and symptoms of strep pharyngitis and those more typical of a viral "cold" is important when deciding whether to seek medical care from a health care professional. Summaries of these signs and symptoms are included in the following table:

Classic signs and symptoms of strep throat	Signs and symptoms NOT typical of strep throat (more indicative of viral infection)
• Sudden onset of a very sore throat. • Deeply red throat and tonsils, sometimes with white patches and pus. • Difficulty swallowing. • Fever >101°F • Headache • Tender and often swollen lymph nodes in the neck. • Shivers and shaking alternating with cold sweats. • In children, often nausea, vomiting and abdominal pain.	• Stuffy or runny nose • Cough • Hoarseness • Diarrhea • Conjunctivitis

Testing: Bacterial culture of a pharyngeal swab is the standard for accurately diagnosing strep pharyngitis. However, the quality of the sample can affect the result, especially among small, uncooperative children from whom specimens are more difficult to obtain. Cultures, while accurate, typically take 48-72 hours for results. Rapid antigen tests use the same specimens collected for culture, give quick results and are highly specific when positive. A negative result should be followed with a culture.

Treatment: Patients with acute GAS pharyngitis should be treated appropriately with an antibiotic at the proper dose and duration (usually 10 days) to eradicate the bacteria from the throat.

Group A Strep carriage and "repeated infections"

During the winter and spring in temperate climates, generally about 20% (there is a broad range) of asymptomatic school-children may be GAS carriers and can remain in a carrier status for up to 6 months. During that time, a child will typically experience episodes of viral illness, some causing pharyngitis. A child who is a GAS "carrier" will likely test positive for GAS using a throat culture or rapid antigen test. It is GAS **carriage** that propels the "repeated infection" scenario often described in school clusters.

The 2012 *Red Book* explains: "Patients who have repeated episodes of pharyngitis at short intervals and in whom GAS infection is documented...present a special problem. Most often, these people are **chronic GAS carriers** who are experiencing frequent viral illnesses and for whom repeated testing and use of antimicrobial agents are **unnecessary**."

Failure rates of strep pharyngitis treatment with proper antibiotic therapy are low. Thus, a child with a positive throat swab specimen following appropriate antimicrobial therapy is most likely a GAS carrier or adherence to antibiotic therapy should be questioned.

GAS carriage is difficult to eradicate and there is no benefit to doing so unless there are special circumstances (e.g., family member with ARF or community outbreak of ARF). Carriers appear to be unlikely to spread GAS to close contacts and are at extremely low risk (if any) for developing complications. In situations where a child has no symptoms or has symptoms more indicative of a viral infection (e.g., cough, rhinitis, afebrile) it is NOT recommended to test or treat these children for GAS infections (*Red Book*, 2012, p. 672-5).

Schools, childcare and group settings

The most frequent inquiries regarding school and childcare outbreaks of "strep pharyngitis" are triggered by large numbers of children and staff out sick, self-reported sore throats and complaints that certain individuals have had repeated "strep" infections (sometimes reported as high as 8-10 times in an individual during the same school year). High rates of reported sore throat can give school officials the impression of an unusual outbreak of strep pharyngitis, but more often the situation is just a combination of typical viral illness rates concurrent with an expected occurrence of strep pharyngitis.

When experiencing high rates of absenteeism because of illness in school, childcare and group settings, the following guidelines can be useful:

> Children with laboratory confirmed GAS pharyngitis: These children should be excluded from school, childcare and group settings until 24 hours after beginning treatment with appropriate antibiotic therapy. Proper antibiotic treatment should minimize the risk of GAS transmission after 24 hours, and children should be allowed to return to school, childcare and other group activities if they feel well and are not experiencing a fever.
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> Children who test negative for GAS, or were not tested: It is generally recommended that a child experiencing "influenza-like illness" (fever with cough or sore throat) must stay home from school for at least 24 hours after they no longer have a fever, without the use of fever-reducing medicine, and other symptoms improve. A fever is defined as a temperature of 100°F or higher.

Whether the cause of respiratory illness occurring in a school, child-care or group setting is viral or bacterial, the best advice to prevent the spread of all seasonal illness is the following:

- Avoid close contact with people who are sick.
- Stay home when you are sick.
- Cough or sneeze into your sleeve, or cover your mouth and nose with a tissue when you cough or sneeze.
- Wash your hands with soap and water or use hand sanitizer if no water is available, after coughing or sneezing and prior to eating
- Avoid unnecessarily touching your eyes, nose or mouth.

In the event of a call from a school reporting high absentee rates and illness among faculty and students, it is always prudent to remember that there are many respiratory viruses that can cause sore throat and other symptoms of acute respiratory illness that result in substantial absentee rates. Typically, there will be multiple illnesses caused by different etiologies occurring in children throughout the year. A combination of excluding sick children and staff, increased hand hygiene and time will help in getting through another winter season.

Further reading and resources

Clinical practice guideline for the diagnosis and management of group A Streptococcal pharyngitis: 2012 update by the Infectious Diseases Society of America
http://www.idsociety.org/uploadedFiles/IDSA/Guidelines-Patient_Care/PDF_Library/Strep.pdf

CDC - Pharyngitis: Treat Only Proven GAS: Physician Information Sheet (Pediatrics)
http://www.cdc.gov/getsmart/campaign-materials/info-sheets/child-pharyngitis.html

Dr. Rotbart's GERMGems™ - Strep Throat
http://www.germproofyourkids.com/germgems4.html

Confessions of a Dr. Mom – Strep throat blog
http://www.confessionsofadrmom.com/2011/03/strep-throat-dilemma/

CDC Health Promotion Materials - Handwashing
http://www.cdc.gov/handwashing/resources.html

American Academy of Pediatrics. Strep Throat (Streptococcal Pharyngitis) and Scarlet Fever Quick Reference Sheet. In: Aronson SS and Shope TR, eds. *Managing Infectious Diseases in Child Care and Schools: A Quick Reference Guide.* Elk Grove Village, IL: American Academy of Pediatrics; 2009:139-140.

References

Shulman ST, Bisno AL, Clegg HW, et al. Clinical Practice guideline for the diagnosis and management of group A Streptococcal pharyngitis: 2012 update by the Infectious Diseases Society of America. Clin Infect Dis. 2012;55:e86-e102

American Academy of Pediatrics. Group A Streptococcal Infections. In: Pickering LK, Baker CJ, Kimberlin DW, Lon SS, eds. *Red Book: 2012 Report of the Committee on Infectious Diseases.* Elk Grove Village, IL: American Academy of Pediatrics; 2012:668-678.

American Public Health Association. Streptococcal Diseases Caused by Group A (Beta Hemolytic) Streptococci. In: Heymann DL, ed. *Control of Communicable Diseases Manual.* Washington, DC, USA: American Public Health Association; 2008:577-585.

Shaikh N, Leonard E, Martin JM. Prevalence of streptococcal pharyngitis and streptococcal carriage in children: a meta-analysis. *Pediatrics*. 2010 Sep;126(3):557-64.