

The Doctor is in

Strep Aside

BY DR. DAVID HILL

Strep throat is a huge pain in the neck, both for children and their parents. In fact, sore throat is the most common complaint among school-aged children who visit their doctors. Only around fifteen percent of those children have strep, but even the doctor can't guess which ones they will be.

Who gets strep throat?

Infants very rarely get strep, probably because they are still protected by their mother's antibodies. Toddlers under age two are a little more prone to strep throat, but it's still pretty uncommon at this age. Strep throat peaks in the school years, partly due to children's increased exposure to the bacteria at that time. Antibodies to the strep bacteria are not perfectly protective, but they do help to some extent, which is probably why adolescents and adults seem less susceptible.

How do you know it's strep?

No one can reliably predict which patients with sore throat will test positive for strep. Patients typically have throat pain, fever, difficulty swallowing, malaise, headache, abdominal pain, and vomiting. Strep usually *doesn't* cause runny nose, cough, hoarseness, or diarrhea. On exam, patients with strep often have pus (exudate) on the tonsils, red spots (petechiae) on the soft palate, swollen glands (lymph nodes) in the neck, and a very fine "sandpaper" rash on the chest or groin. But in one study of patients who had five out of five criteria for strep, only about half of them tested positive. In another study doctors over-estimated by 81% how many patients would test positive for a strep infection.

That means even the best clinicians cannot guess who will have strep without a throat swab. There are actually two different tests for strep. The most common is the rapid strep test, which takes less than five minutes. Rapid tests use antibodies to detect the presence of strep bacteria. But the rapid test is less sensitive, missing five to ten percent of infections. So in cases where the rapid test is negative we send a throat culture, actually growing the strep bacteria on agar. The culture takes one to two days to grow, but it's much more sensitive. Both types of tests may miss strep in a patient who has already taken antibiotics, another good reason not to reach for that old bottle of amoxicillin at the back of the fridge.

If strep only causes 15% of sore throats, then what's the other 85%?

Strep, or streptococcus, actually refers to

a whole family of bacteria. Only one member of this family, group A beta-hemolytic strep (GABHS or *Strep pyogenes*), causes treatable sore throats. Other groups, including C and G, may infect the throat, but only GABHS causes rheumatic fever.

In children, the most common causes of sore throat are viral, including rhinovirus, corona virus, parainfluenza ("croup"), influenza, adenovirus, and Epstein-Barr virus ("mono"). Herpes simplex virus is a common cause of severe sore throat. Coxsackie and echovirus are common in the warm months.

Less common bacterial causes include *Neisseria gonorrhoea*, usually in sexually active teens or adults, and often accompanied by genital symptoms and a rash. *Corynebacterium diphtheria* is very rare in immunized children but may cause a gray membrane on the soft palate. *Arcanobacterium hemolyticum* infects tonsils but is quite rare within the United States. *Mycoplasma* and *Chlamydia pneumonia* may cause sore throat, but usually with cough. Non-infectious causes of sore throat include gastroesophageal reflux disease, allergic rhinitis, and post-nasal drip.

Why treat strep throat?

The symptoms of strep throat usually improve in three to five days. Treating early may shorten symptoms slightly. But though untreated patients eventually feel fine, the bacteria linger in the throat for weeks to months. Treating prevents transmission of strep after just 24 hours.

The most important reason to treat is to prevent rheumatic fever. Rheumatic fever occurs when the immune system makes antibodies to the strep bacteria that then attack the heart, brain, joints, and skin. So as long as GABHS is treated within nine days of onset, rheumatic fever can be averted. We also treat to prevent a kidney condition called post-streptococcal glomerulonephritis.

Some children, called strep carriers, seem to harbor GABHS without becoming ill. These children may see their doctors for sore throats associated with a cold and test positive for strep. They often continue to test positive despite adequate therapy. For now there's no way to differentiate these patients from those with actual strep throat infections, so we treat everyone who tests positive.

Why not just treat all sore throats with antibiotics?

Since no more than 15% of sore throats are caused by GABHS, most patients would

get unnecessary therapy. This leads to the development of antibiotic resistance and exposes patients to complications like rash, diarrhea, and serious drug allergies. In rare cases a doctor may prescribe antibiotics with a negative rapid strep test, but he or she would always call the patient to stop the antibiotics if the throat culture comes back negative.

What's the best treatment for strep throat?

Penicillin has been the mainstay of strep therapy since its discovery. Unlike other bacteria, GABHS seems incapable of developing resistance to penicillin. After ten days of therapy 90% of patients are cured, and the 10% who test positive are most likely re-infected. Because amoxicillin tastes better, many providers prescribe it in place of plain penicillin. With either drug it's important to take it all ten days; failure rates skyrocket with shorter courses.

Azithromycin (Zithromax) is a popular choice, especially in patients who are allergic to penicillins. It may also be given for five days, improving compliance. But GABHS has developed resistance to azithromycin in some places, so penicillin is preferred when possible. Cephalosporins are another class of antibiotics that cure strep, and they may be used safely in some penicillin-allergic patients.

Who needs a tonsillectomy for strep throat?

Tonsillectomies are most effective in patients who have *lots* of strep throat. Current criteria suggest tonsillectomy if a patient has more than six separate infections in a single year. Five infections a year for two straight years or three infections a year for three successive years also count. For patients with fewer infections, tonsillectomy seems less useful.

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