

# Acute sore throat

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Only a small proportion of people with sore throats have bacterial infections, but “strep throat” has a strong place in the public mind. Children aged 5 to 15 years are much more likely to have streptococcal infections than are younger children and adults, and this should be remembered when treating sore throats.

*One Friday afternoon, Joe Smith, a 13-year-old boy, comes in with his father. He complains of a sore throat and of feeling unwell for 3 days; he has missed 2 days of school. He does not have a cough or a rash.*

*His medical record shows that he is up to date on his immunizations and that he was constipated as a baby. He broke his left arm falling off his bike at age 7. He has had minor lacerations to his forehead and to his knee (which needed stitches). He has attended twice with throat infections and once with otitis media, receiving antibiotics on all 3 occasions. Otherwise he has been healthy; no allergies, hospital admissions, or surgeries are noted.*

## Epidemiology and population at risk

Acute throat infections are among the most common infectious diseases seen by FPs<sup>1,2</sup>; they are responsible for 2% to 4% of all FP visits.<sup>3</sup> Viruses cause 85% to 95% of throat infections in adults and children younger than 5 years of age; for those aged 5 to 15 years, viruses cause about 70% of throat infections, with the other 30% due to bacterial infections, mostly group A β-hemolytic streptococcus (GABHS).<sup>4</sup> Attendance at an institution where streptococcal infection is present increases the chance of infection.

*As Joe is 13, he has a greater chance of a streptococcal infection than if he were an adult or small child. Nonetheless, there is only about a 1 in 3 chance that this infection is streptococcal. You are not aware of any streptococcal outbreaks in the local school.*

## What else could it be?

Figure 1 shows that the common cold and streptococcal infections are the most common causes of sore throat in this age group; all other causes are very rare in primary care.

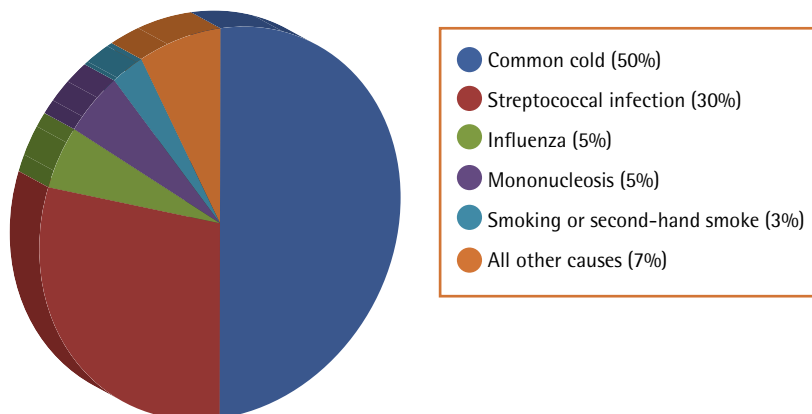
*As Joe is an otherwise healthy child, the sore throat is most likely due to the common cold or a streptococcal infection. Influenza and mononucleosis are possibilities, but you are not aware of any other cases locally. You do know that some 13-year-olds do smoke.*

*Before examining Joe, you think about what else it could be and consider whether alarm features are present.*

**Alarm symptoms.** Joe has not been exposed to any epidemic disease, nor has he been exposed to an environmental hazard. His father does not think he has been running a high fever, nor did the illness come on very suddenly. He does not complain of muscle aches. He has not been short of breath or coughing.

**Alarm signs.** Joe looks fairly well. He is not drooling, coughing, or shivering. He has no rash.

Figure 1. Distribution of causes of sore throat in children



Joe has no alarm symptoms or alarm signs. These facts, together with the absence of cough, make GABHS infection and infectious mononucleosis the most likely diagnoses. You proceed to examine Joe.

**Clinical examination.** He looks slightly unwell. His temperature is 37.9°C; his pulse is 82 beats per minute; and his respiratory rate is 14 breaths per minute. Findings of chest, abdomen, and ear examination are normal; there is no runny nose or added lung sounds. He has palpable cervical neck glands on both sides, but the glands are not very tender; you can find no other swollen glands, and his spleen and liver are not palpable. His tongue is furred and there is an exudate on both tonsils.

*The absence of swollen glands, other than those in the neck, makes mononucleosis less likely. The absence of runny nose and cough makes a cold or influenza less likely. The absence of rash and Joe's complete immunization history make the common viral exanthems less likely. His age, Western upbringing, and immunization status make diphtheria and epiglottitis unlikely.*

*You are becoming confident that no serious cause of his sore throat is present. You are beginning to think that he might have a streptococcal throat infection.*

### How sure of the diagnosis are you?

Many attempts have been made to identify a constellation of signs and symptoms that will increase the likelihood of GABHS infection being present.<sup>5,6</sup> The consensus that has emerged is that the 4 most important features to look for are enlarged submandibular glands, an exudate on the throat, the presence of fever, and the absence of cough or runny nose. If the patient is aged 5 to 15 years, there is a further increase in the likelihood of infection with GABHS (**Box 1**).<sup>6</sup>

#### Box 1. Toronto sore throat rule

Score 1 point for the presence of each of the following features:

- Temperature greater than 38°C
- Absence of cough
- Presence of enlarged or tender glands
- Presence of tonsillar exudates
- Age younger than 15 y

Score 0 or 1: No antibiotic treatment

Score 2 or 3: Do throat swab and culture

Score 4 or 5: Treat with antibiotic or do throat swab\*

Data from Mclsaac et al.<sup>6</sup>

\*The positive likelihood ratio for a Mclsaac score of 4 out of 5 is 3.0 in children and 25.0 in adults.

As Joe is 13 years old, he has a 30% chance that his sore throat is due to a streptococcal infection; he has a high Mclsaac score (**Box 1**),<sup>6</sup> so his chances of having a streptococcal infection are  $30\% \times 3 = 90\%$ .

*The absence of cough, slight fever, presence of pus and enlarged nodes, and the patient's young age, are all compatible with a diagnosis of streptococcal throat infection and infectious mononucleosis.*

*You explain the possibilities to the father and son. Joe now remembers that 3 other children in his class are off school with a similar infection. You order a rapid streptococcal antigen test and a monospot test; you agree to see them tomorrow when the test results will be available.*

Results are negative for the monospot test and positive for the streptococcus test. The sensitivity of the monospot test is 82% and its specificity is 99%;<sup>7</sup> the sensitivity of the streptococcal antigen test is 85% and its specificity is 97%.<sup>8</sup>

*You inform patient and father that results of the test for streptococcus are positive; Joe most likely does have a streptococcal throat infection.*

### Is it likely to get worse?

In otherwise healthy people, a sore throat infection is usually a self-limiting illness and rarely produces serious after-effects. A general practice study of acute tonsillitis in 17 countries found that in by far most cases, acute sore throat resolved within 1 week.<sup>9</sup> The control groups in antibiotic trials for sore throat treatment have shown that 90% of untreated patients are completely better by the end of 1 week, about the same as the proportion of those treated with antibiotics.<sup>10</sup>

Antibiotics can have a modest beneficial effect, improving symptoms at 3 to 4 days and reducing the illness duration by about half a day. There is no effect on time off school or work.<sup>10</sup>

### Deciding on the best treatment

**Acute illness.** Reviews have found that antibiotics have a modest effect on sore throat symptoms.<sup>10,11</sup> Headache, sore throat, and fever are all slightly less severe when patients with cultures positive for GABHS are treated with antibiotics: the number needed to treat (NNT) with antibiotics to produce 1 patient who improves faster is about 8; the mean duration of the illness is shortened by less than 1 day; there is no difference in time off school or off work.<sup>10</sup> These minor benefits must be weighed against the increased incidence of side effects such as vomiting, diarrhea, abdominal pain, and rashes: the number needed to harm is about 10. Throat infection can sometimes be associated with other local infections:

the NNT to prevent acute otitis media is about 30 in children and about 145 in adults. The NNT to prevent quinsy is about 30 and to prevent acute sinusitis is about 50.

**Effect on long-term complications.** Although treatment with penicillin will greatly lower the rate of acute rheumatic fever, the rate of serious rheumatic heart disease is now so low that it has been estimated that the NNT is about 15 000.<sup>12</sup> Antibiotic treatment has no detectable effect on reducing acute glomerulonephritis.

### Which is the best antibiotic to use?

Fortunately, GABHS remains very sensitive to penicillin V because the bacterium cannot manufacture  $\beta$ -lactamase. The evidence suggests that a 5-day course is clinically as effective as a 10-day course, although there might be slightly less eradication of the organisms from throat culture.<sup>13</sup>

### Should I be using nonantibiotic treatments?

Some physicians have used oral corticosteroids to relieve the inflammation of sore throat, but only in severe cases<sup>14</sup> and for adults<sup>15</sup>; steroids for sore throat have not been

studied in children. There are also proponents of Chinese medicinal herbs for treating sore throats, but concerns exist about the safety of such herbs, and the quality of the evidence for their use is weak.<sup>16</sup>

### Is it safe to wait and see?

You have heard that delayed prescriptions for antibiotics result in much lower use of them, without apparent ill effects to patients.<sup>17,18</sup> In particular, you remember reading about a UK trial in which the rate of antibiotic use was reduced from 99% to 31%, in children with otitis media, with no apparent ill effects.<sup>19</sup>

*You explain to Joe's father that it is likely that Joe has a streptococcal throat infection. Such infections are mildly relieved by penicillin treatment, but the effect is greater in patients who are more ill than Joe is. He is a healthy boy, and it is likely that the worst of his infection is over; he will probably be better anyway in a few days. There is no harm in taking analgesics and soothing drinks.*

As there are no signs of complications, you give Mr Smith a prescription for a 5-day course of penicillin V,

and suggest that Joe only take the antibiotics if he has not improved in 2 days. They are to come back and see you again if there are any problems with the illness or the treatment.



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### Competing interests

None declared

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