QUESTION: In children with suspected group A β-haemolytic streptococcal pharyngitis, how well does a prediction model predict a positive throat culture?

Design
1 year validation of a previously derived prediction model.

Setting
Paediatric emergency department and 2 paediatric outpatient clinics in Wilmington, Delaware, USA.

Patients
587 children (mean age 6.8 y; 51% girls) who had signs and symptoms of acute pharyngitis. Exclusion criteria were antibiotic treatment within 5 days of enrollment.

Description of prediction guide
During the clinical evaluation, the examining physician recorded 4 variables from the tested model: cervical lymphadenopathy, tonsillar swelling (2 category severity scale: absent or mild and moderate or severe), coryza, and scarlatiniform rash (present or absent). 2 tonsillo-pharyngeal specimens were collected for each patient for serotyping (diagnostic standard) and a rapid streptococcal antigen detection test. Furthermore, the physician made a subjective probability estimate for a GABHS-positive throat culture result (11-point scale: 0 = most unlikely and 10 = extremely likely).

Main outcome measures
A performance score was calculated for the prediction model ranging from 0 to 5, with higher scores indicating more severe indications of the clinical variables. Sensitivity, specificity, likelihood ratios, and post-test probability were calculated for cutoff points of the performance score.

Main results
218 children (37%) had positive culture results for GABHS. The prediction model did better than the physicians' probability estimates and was comparable to the rapid antigen detection test (table). The model did not differ in performance according to setting (emergency department v outpatient clinic) or study period (in season [January to March] v off season [April to December]).

Conclusion
In children with suspected group A β-haemolytic streptococcal pharyngitis, a clinical prediction model predicted a positive throat culture as well as a rapid antigen detection test and better than subjective estimation by physicians.

COMMENTARY
The study by Attia et al shows that clinicians are not good at estimating the presence of GABHS pharyngitis in symptomatic children (only about 50% of those subjectively estimated as being “strep positive” had a positive GABHS throat culture result). The simple predictive model described here is much more accurate (post-test probability of 70%) and almost as good as a rapid antigen test (post-test probability of 85%). Such results should encourage us to use the model for deciding on management: it is easy to use, quick, and cheaper than the rapid antigen test. However, one interesting finding from this well-conducted study was the high culture rate in the control group (children with no sore throat being seen for other reasons; 15%) compared with that in children with symptoms (37%). In children with a strep-positive culture result, distinguishing carrier state from infection remains difficult. This is a weakness of the study, unlike the study by Dagnelie et al in which a better measure of infection—a 4-item model (cough, exudate on the throat, fever, and neck lymph nodes)—was also compared with anti-streptolysin-O titers. But let us step back a moment. Why is accurate diagnosis of streptococcal sore throat and its differentiation from other causes of sore throat important? It enables us to treat “strep throat” with antibiotics to prevent acute rheumatic fever (ARF), acute glomerulonephritis, and suppurrative complications, and to shorten the illness or decrease its severity. But in many areas, ARF is so rare that treating it might create as much risk from the antibiotics as there is from the disease, and the symptomatic benefits of antibiotics are so modest that alternative, non-antibiotic treatment may be as good if not better.

Perhaps we should think carefully about what we intend to do once we diagnose GABHS before worrying too much about how to diagnose it. Only in clinical settings where ARF is common (eg, developing countries) or in patients with special concerns for symptomatic relief, should we concern ourselves with deciding the cause. After all, sore throats get better spontaneously.