

## Challenge M244-1

February 2025

Throat: No group A, C, G beta hemolytic streptococci or *Arcanobacterium haemolyticum* isolated

### HISTORY

A simulated throat sample collected from a 10 year old with a sore throat was sent to category A laboratories.

Participants were expected to isolate and report "No group A, C, G beta hemolytic streptococci or *Arcanobacterium haemolyticum* isolated"

### CMPT QA/QC/STATISTICS

All simulated throat samples are produced at CMPT according to CMPT internal protocols. The sample contained a pure culture of *Staphylococcus aureus*.

The samples are assessed for homogeneity and stability using in-house quality control methods and random selection of samples before and during production, and post sample delivery. The number of random samples selected is 15% of the total production batch.

The challenge sample lot was confirmed to be homogeneous and stable for at least 14 days from shipping. Organism identification was confirmed by a reference laboratory.

All challenge components have in-house assigned values based on the most clinically appropriate result; the most clinically appropriate result is determined by expert committee evaluation. No further statistical analysis is performed on the results beyond that described under "Suitability for grading."

### SURVEY RESULTS

#### Reference laboratories

**Identification:** 11/13 (85%) labs reported no group A ± C, G isolated, 1 lab reported no *Streptococcus pyogenes* (group A) isolated, *Staphylococcus aureus* isolated, but would only be reported from a newborn throat culture, 1 lab reported *Staphylococcus aureus*

### MAIN EDUCATIONAL POINTS from M244-1

1. The finding of no Group A, C, or G beta-hemolytic streptococci or *Arcanobacterium haemolyticum* in a throat swab is clinically important because it strongly suggests that the patient's sore throat is not due to a bacterial infection commonly associated with streptococcal pharyngitis. Group A *Streptococcus* (GAS) is the most common bacterial cause of strep throat and is linked to complications such as rheumatic fever and post-streptococcal glomerulonephritis, while Groups C and G can cause similar infections, especially in adults. The absence of these organisms indicates a low risk for such complications, and that the illness is more likely caused by a viral pathogen, which typically resolves without antibiotic treatment.
2. This result is significant because it prevents unnecessary antibiotic use, supporting antimicrobial stewardship efforts by avoiding over-prescription, reducing side effects, and limiting the development of antibiotic resistance. It also minimizes concern for contagious bacterial transmission, particularly in environments such as schools, households, or healthcare settings. Clinically, this finding helps guide physicians toward supportive care and encourages consideration of non-streptococcal or viral causes if symptoms persist. Overall, the negative result offers reassurance, reduces the likelihood of overtreatment, and supports a more targeted, conservative approach to care.

#### Participants

**Identification:** 45/50 (90%) reporting laboratories reported "no group A *Streptococcus* +/- no A. *haemolyticum*, group C, G *Streptococcus*. 2 participants indicated the presence of *S. aureus* but mentioned that it would only be reported if the sample were from a newborn. 3 labs reported *S. aureus* (Table 1)

#### Suitability for Grading

A challenge is considered suitable for grading if agreement is reached by 80 percent of selected reference group and at least 50 percent of the participants.

Sample results interpretation was correctly performed by at least 80 percent of reference laboratories and greater than 50 percent of all laboratories and was thus, determined to be suitable for grading.

#### Grading

##### Maximum grade: 4

Reporting the absence of beta hemolytic group A, C, or G or *Arcanobacterium haemolyticum* in the sample was graded 4

**Table 1.** Clinical relevancy results

Reported	Total	Grade
no <i>Streptococcus</i> group A ( <i>S.pyogenes</i> ), ± C, G ± <i>Arcanobacterium haemolyticum</i> isolated, ± beta-haemolytic ± normal oropharyngeal flora	41	4
absence de Streptocoques bêta-hémolytiques des groupes A, C, G	4	4
no <i>Streptococcus pyogenes</i> (group A) isolated, <i>Staphylococcus aureus</i> isolated, but would only be reported from a newborn throat culture	2	4
culture yielded heavy growth of a beta-hemolytic staphylococcus aureus. Unable to rule out group A,C, or G Streptococcus. Please resubmit if required.	1	1
<i>Staphylococcus aureus</i> , absence de croissance de streptocoques bêta-hémolytiques des groupes A. C et G	1	0
<i>Staphylococcus aureus</i> 4+	1	0
no report	1	0
<b>Total</b>	<b>51</b>	

## COMMENTS ON RESULTS

A vast majority of the laboratories got the correct response. 45 out of the 51 (88.4) laboratories got the response right. Based on the fact that 1 of the 13 reference laboratories identified a *Staphylococcus aureus* isolate, I would consider the partial points to the 2 laboratories.

## CLINICAL RELEVANCE

Pharyngitis is caused by a wide range of pathogens, but most cases are due to viral pathogens followed by *Streptococcus pyogenes*. Over treatment of non-group A beta-hemolytic streptococcal pharyngitis is one of the major causes of inappropriate use of antibiotics.<sup>1</sup>

*Staphylococcus aureus* constitute part of the normal upper respiratory flora and there is no evidence that these organisms cause acute pharyngitis. Therefore, reporting these organisms from throat swab cultures may be clinically misleading, and result in inappropriate antibiotic treatment.<sup>2,3</sup>

The normal oropharyngeal flora consists of over 300 bacterial species.<sup>4</sup> *Streptococcus*, *Peptostreptococcus*, *Veillonella*, *Lactobacillus*, *Corynebacterium*, and *Actinomyces* species account for more than 80% of the total cultivable oral flora.

The oral microbiome however, evolves with age. The oropharynx rapidly becomes colonized following exposure to the maternal birth canal. Anaerobic species such as lactobacilli and *Veillonella* species are detectable within a few hours. Streptococcal species become established within 2 days of birth and predominate throughout early childhood and puberty.<sup>5,6</sup>

## REFERENCES

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