# Aim

To describe the processing of clinical specimens collected for investigation of potential infection of the pharynx (throat).

# Principle

Swab specimens are collected from the throat to determine the presence of organisms associated with pharyngeal infection.

The majority of pharyngitis is caused by respiratory viruses. Beta-haemolytic streptococci are the predominant bacterial pathogens associated with sore throats (Lancefield Groups A, C, and G). The small colony variants of Groups C and G (*S. anginosus* group) are not associated with pharyngitis. Toxigenic *Corynebacterium diphtheriae* (or *C. pseudotuberculosis /* ulcerans) is an important pathogen in severe cases where a pseudomembrane is found in the throat, although it is now rare as a result of routine childhood immunisation.

# Method

## Specimen collection

Specimens should be collected using sterile swabs and placed into Amies transport medium (+/- charcoal).

## Specimen transport and storage

Specimens should ideally be stored and transported in sealed plastic bags. Laboratory processing should occur as soon as possible after specimen collection. Specimens should be refrigerated if delays in processing over two hours are unavoidable.

## Specimen processing

### Reception

Log the specimen in the appropriate specimen book and assign a specimen number.

### Microscopic examination

Gram staining is not required.

### Culture

Inoculate a sheep blood agar plate (BA) and incubate at 35 - 37°C for 20 - 24h in 5 – 10% CO2.

If the request form states that the patient is HIV positive or “?candida / yeast infection” then also inoculate a Sabouraud agar plate (SAB): culture at 35 - 37°C for 40 - 48h in air (read plates daily).

If the clinician suspects gonorrhoea / sexual abuse then also inoculate a GC plate: culture at 35 - 37°C for 40 - 48h in 5 – 10% CO2 (read plates daily).

If the clinician requests melioid culture, refer to SOP MIC-013.

# Interpretation

Record the semi-quantitative growth of beta-haemolytic colonies (i.e. +/- to ++++).

## Minimum level of identification in the laboratory

Beta-haemolytic streptococci should be confirmed by Gram stain, catalase, and Lancefield group (summarised in SOP MID-004).

Significant isolates:

* Group A, C, and G beta-haemolytic streptococci
* *Corynebacterium diphtheriae* (or *C. pseudotuberculosis /* ulcerans)
* *Burkholderia pseudomallei*
* Yeasts (report as “yeasts”) – if Sabouraud plate inoculated
* *Neisseria gonorrhoeae*

## Antimicrobial susceptibility testing

All significant isolates should have antimicrobial susceptibilities determined according to SOP MIC-001.

## Reporting

Culture results: presence of significant isolates (i.e. Group A, C or G beta-haemolytic streptococci); no significant growth; absence of growth.

# Quality assurance

Media and identification tests should be quality controlled according to the relevant SOP.

# Limitations

Prior antimicrobial use may result in negative cultures.

# References

1. Health Protection Agency, UK SOP B24: Investigation of Throat swabs (Issue 8.2; December 2012).

# Synopsis / Bench aid



# Risk assessment

|  |  |
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| **COSHH risk assessment - University of Oxford COSHH Assessment Form** | |
| **Description of procedure**  Culture of throat swabs | **Substances used**  Variable, depending on organism cultured (may include Gram stain reagents; 3% hydrogen peroxide (catalase test); Phadebact GC test; streptococcal grouping kit (Oxoid)) |
| **Quantities of chemicals used**  Small | **Frequency of SOP use**  Daily |
| **Hazards identified**  1. Autoclaved liquid  2. Potentially infectious material in sample  3. Potentially pathogenic bacteria  4. Chemical exposure form bacterial identification tests | **Could a less hazardous substance be used instead?**  No |
| **What measures have you taken to control risk?**  1. Training in good laboratory practices (GLP)  2. Appropriate PPE (lab coat, gloves, eye protection)  3. Use of biosafety cabinet for reading of plates / follow-up of BSL-3 organisms (e.g. *B. pseudomallei*) | |
| **Checks on control measures**  Observation and supervision by senior staff | |
| **Is health surveillance required?**  No | **Training requirements:**  GLP |
| **Emergency procedures**:  1. Report all incidents to Safety Adviser  2. Use eyewash for splashes  3. Clean up spills using 1% Virkon or chemical spill kit | **Waste disposal procedures**:  1. Sharps discarded into appropriate rigid containers for incineration  2. Infectious waste discarded into autoclave bags or 1% Virkon solution prior to autoclaving and subsequent incineration  3. Chemical waste disposed of according to manufacturer’s instructions |