INVESTIGATION OF NOSE SWABS

BSOP 5

Issued by Standards Unit, Department for Evaluations, Standards and Training
Centre for Infections
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The reader is informed that all taxonomy in this document was correct at time of issue.

Suggested citation for this document:

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INVESTIGATION OF NOSE SWABS

Type of specimen: Nose swab

SCOPE OF DOCUMENT

This document describes the processing and bacteriological investigation of nose swabs.

INTRODUCTION

Nasal colonisation with *Staphylococcus aureus* increases the risk of staphylococcal infections at other sites of the body such as postoperative wounds and dialysis access sites. It is also associated with recurrent skin infections and nosocomial infections in nurseries and hospital wards. *S. aureus* is a major cause of morbidity and mortality in haemodialysis patients as most patients carry the organism in their anterior nares.

Eradiation of nasal carriage of *S. aureus* may be beneficial in certain clinical conditions such as recurrent furunculosis. Systemic, in addition to topical, treatment is appropriate for nasally colonised patients who have infection elsewhere. Topical antibacterial agents such as mupirocin and chlorhexidine/neomycin are preferred to systemic formulations when a patient is identified as a carrier.

Nose swabs may be used to investigate carriage of Lancefield group A streptococcus and Meticillin Resistant *Staphylococcus aureus* (BSOP 29 - Investigation of specimens for screening for MRSA).

Surveillance screening of neonates may include a nose swab (BSOP 23 - Investigation of gastric aspirates and infection screen swabs from neonates).

There is no clear evidence regarding the significance of isolating *Haemophilus influenzae* and *Streptococcus pneumoniae* from nose swabs as a predictor of involvement in infections such as sinusitis.

Although nose swabs are not the ideal specimen for the examination of nasal discharge, they are sometimes received. Nasal discharge may be a presentation of diphtheria. However, nose swabs are not routinely cultured for *Corynebacterium diphtheriae*. Nasal swabs should not be taken to investigate the presence of *Bordetella pertussis*.

Rhinoscleroma, due to infection with *Klebsiella rhinoscleromatis*, is a rare form of chronic granulomatous nasal infection affecting the nasal passages and sinuses which can also include the pharynx and larynx. The disease is progressive and manifests itself by tumor-like growths with local extension. Although common in Eastern Europe, Central Africa, Latin America and South East Asia, rhinoscleroma appears to be poorly communicable.

Ozaenia (ozena) is a chronic atrophic rhinitis. The condition can destroy the mucosa and is characterised by a chronic, purulent and often foul-smelling nasal discharge. *Klebsiella ozaenae* may have an etiological role.

*Rhinosporidium seeberi*, an aquatic protistan protozoan, producing polypoid masses may affect the nasal mucosa of persons living in India, Sri Lanka, parts of SE Asia, America and parts of Europe, including Eastern Europe. Close collaboration between physicians, ENT surgeon, microbiologist and histopathologist is necessary to reach a diagnosis. Superficial swabs are likely to be inadequate; scrapings or biopsy material are most likely to yield the organism (BSOP 19 - Investigation of sinus aspirate).
TECHNICAL INFORMATION/LIMITATIONS

N/A
1 SAFETY CONSIDERATIONS

1.1 SPECIMEN COLLECTION
N/A

1.2 SPECIMEN TRANSPORT AND STORAGE
Sealed plastic bag

1.3 SPECIMEN PROCESSING
Containment Level 2

Laboratory procedures that give rise to infectious aerosols must be conducted in a microbiological safety cabinet

Refer to current guidance on the safe handling of all organisms documented in this NSM

The above guidance should be supplemented with local COSHH and risk assessments

Compliance with postal and transport regulations is essential

2 SPECIMEN COLLECTION

2.1 OPTIMAL TIME FOR SPECIMEN COLLECTION
Before antimicrobial therapy where possible

2.2 CORRECT SPECIMEN TYPE AND METHOD OF COLLECTION
Plain sterile cotton wool swab. Sample the anterior nares by gently rotating the swab over the mucosal surface

2.3 ADEQUATE QUANTITY AND APPROPRIATE NUMBER OF SPECIMENS
N/A

3 SPECIMEN TRANSPORT AND STORAGE

3.1 TIME BETWEEN SPECIMEN COLLECTION AND PROCESSING
Specimens should be transported and processed as soon as possible

3.2 SPECIAL CONSIDERATIONS TO MINIMISE DETERIORATION
Swabs should be transported in Amies transport medium with charcoal

If processing is delayed, refrigeration is preferable to storage at ambient temperature
4 SPECIMEN PROCESSING

4.1 TEST SELECTION
MRSA - see BSOP 29 - Investigation of specimens for screening for MRSA.

4.2 APPEARANCE
N/A

4.3 MICROSCOPY
(BSOPTP 39 - Staining Procedures)

4.3.1 Standard
Gram stain is not normally indicated but may be useful if rhinoscleroma is suspected

4.4 CULTURE AND INVESTIGATION

4.4.1 Pre-treatment
N/A

4.4.2 Specimen processing
Inoculate each agar plate with a swab (see QSOP 52 - Inoculation of culture media (formerly BSOP 54))

For the isolation of individual colonies, spread inoculum with a sterile loop
### 4.4.3 Culture media, conditions and organisms for all specimens:

<table>
<thead>
<tr>
<th>Clinical details/conditions</th>
<th>Standard media</th>
<th>Incubation</th>
<th>Cultures read</th>
<th>Target organism(s)</th>
</tr>
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<tr>
<td></td>
<td></td>
<td>Temp °C</td>
<td>Atmos</td>
<td>Time</td>
</tr>
<tr>
<td>Boils S. aureus carriage</td>
<td>Blood agar</td>
<td>35-37</td>
<td>5-10% CO₂</td>
<td>≥16 h</td>
</tr>
<tr>
<td>Lancefield group A streptococcus carriage</td>
<td>Blood agar</td>
<td>35-37</td>
<td>5-10% CO₂</td>
<td>≥16 h</td>
</tr>
</tbody>
</table>

For these situations, add the following:

<table>
<thead>
<tr>
<th>Clinical details/conditions</th>
<th>Supplementary media</th>
<th>Incubation</th>
<th>Cultures read</th>
<th>Target organism(s)</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Temp °C</td>
<td>Atmos</td>
<td>Time</td>
</tr>
<tr>
<td>Nasal diphtheria</td>
<td>Hoyle's tellurite agar</td>
<td>35-37</td>
<td>air</td>
<td>40-48 h daily</td>
</tr>
<tr>
<td>Rhinoscleroma</td>
<td>CLED/ MacConkey agar</td>
<td>35-37</td>
<td>air</td>
<td>16-24 h ≥16 h</td>
</tr>
</tbody>
</table>

Other organisms for consideration - MRSA (BSOP 29 - Investigation of specimens for screening for MRSA)

### 4.5 Identification

#### 4.5.1 Minimum level in the laboratory

- **C. diphtheriae**
  - to species level and urgent (same-day) toxigenicity test

- **Lancefield group A streptococcus**
  - to Lancefield group level

- **S. aureus**
  - to species level

Organisms with unusual or unexpected resistance, and whenever there is a laboratory or clinical problem, or anomaly that requires elucidation should be sent to the appropriate reference laboratory.

Note: All work on suspected C. diphtheriae isolates which is likely to generate aerosols must be performed in a safety cabinet.

A medical microbiologist must be informed of all suspected isolates of C. diphtheriae as soon as possible (same-day toxigenicity testing is available from the reference laboratory)
4.5.2 Referral to Reference Laboratories
For information on the tests offered, turn around times, transport procedure and the other requirements of the reference laboratory [click here for user manuals and request forms].
Isolates associated with outbreaks, where epidemiologically indicated and organisms with unusual or unexpected resistance and whenever there is a laboratory or clinical problem or anomaly that requires elucidation should be sent to the appropriate reference laboratory.

4.6 Antimicrobial Susceptibility Testing
Refer to NSM on Susceptibility Testing ([BSOP 45 - Susceptibility Testing](#))

5 REPORTING PROCEDURE

5.1 Microscopy

5.1.1 Microscopy reporting time
N/A

5.2 Culture
Report presence or absence of specific pathogens, also report results of supplementary investigations:

Negatives

"Staphylococcus aureus NOT isolated"

"Lancefield group A streptococcus NOT isolated"

Positives

"Staphylococcus aureus isolated"

"Lancefield group A streptococcus isolated"

Also, report results of supplementary investigations

5.2.1 Culture reporting time
Written report: 16 – 72 h stating, if appropriate, that a further report will be issued

Supplementary investigations: toxigenicity testing of *C. diphtheriae*

MRSA - see [BSOP 29 - Investigation of specimens for screening for MRSA](#)

5.3 Antimicrobial Susceptibility Testing
Report susceptibilities as clinically indicated
6 REPORTING TO THE HPA (LOCAL AND REGIONAL SERVICES AND CENTRE FOR INFECTIONS)

Refer to the following:

Individual SOPs on organism identification

Health Protection Agency publications:

"Laboratory reporting to the Health Protection Agency. A guide for diagnostic laboratories."

"Hospital infection control: Guidance on the control of infection in hospitals"

Local Memorandum of Understanding

Refer to current guidelines on CDSC and COSURV reporting

Local guidelines

Isolation of possible *C. diphtheriae* should be reported urgently to the CCDC
7 ACKNOWLEDGEMENTS AND CONTACTS

This National Standard Method has been developed, reviewed and revised by the National Standard Methods Working Group for Clinical Bacteriology (http://www.hpa-standardmethods.org.uk/wg_bacteriology.asp). The contributions of many individuals in clinical bacteriology laboratories and specialist organisations who have provided information and comment during the development of this document, and final editing by the Medical Editor are acknowledged.

The National Standard Methods are issued by Standards Unit, Department for Evaluations, Standards and Training, Centre for Infections, Health Protection Agency, London.

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APPENDIX

Prepare all specimens

All specimens from
- Boils
- S. aureus carriage
- Lancefield group A streptococcus carriage

Additional media

Nasal diphtheria
- Hoyles’s tellurite agar
  - Incubate at 35-37°C
  - Air
  - 40-48h
  - Read daily

Rhinoscleroma
- CLED agar
  - Incubate at 35-37°C
  - Air
  - 16-24h
  - Read at ≥16h

Blood agar
  - Incubate at 35-37°C
  - 5-10% CO₂
  - 16-24h
  - Read at ≥16h

- S. aureus refer to BSOP ID 7
- Lancefield group A streptococcus refer to BSOP ID 4

- C. diphtheriae refer to BSOP ID 2

- K. rhinoscleromatis refer to BSOP ID
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