# Microbiology User Information: Respiratory Tract Specimens

## Specimen Types:

- Nose and Throat Swabs
- Sputum,
- Endotracheal or Tracheal Aspirates
- Nasopharyngeal Aspirates / Secretions
- Cough Swabs
- Endotracheal Tips
- Bronchoscopy samples, bronchoalveolar lavage (BAL), bronchial washings.

## Indications for Respiratory Samples:

Sputum samples should ideally be collected before any antibiotics are given as sensitivity decreases significantly with even one dose of antibiotics. Sputum samples are frequently contaminated by upper respiratory tract flora so any culture results should be interpreted according to clinical condition of the patient.

Hospital guidelines for respiratory infections: Respiratory Infections (formularywkccgmtw.co.uk)

Primary Care antimicrobial guidelines: Primary Care Antimicrobial Prescribing Guidelines (formularywkccgmtw.co.uk)

## Request form requirements:

Providing adequate clinical details to microbiology request forms is **vital** for the safety of laboratory staff and ensuring patient tests are correctly interpreted.

Please include details of relevant clinical information, current, just finished or intended antibiotic therapy. This includes whether you **suspect the patient of having TB.**

Culture is carried out for a wider range of bacteria and fungi on certain patient groups i.e. Cystic fibrosis, Bronchiectasis, immunocompromised
Culture for Legionella is not routinely performed, please state on request if clinically suggestive

## Time to laboratory:

Specimens should be sent to the laboratory without delay. Delays of greater than 48 hours are undesirable.

BAL and sputum should be processed promptly to give the best opportunity to culture pathogenic organisms and reduce the risk of overgrowth with contaminants.

**If processing is delayed, store refrigerated, rather than at room temperature**

For information on transport, including days and times, please see Pathology Transport Services

## Laboratory Testing:

All Microbiology laboratory investigations are based on UK Standards for Microbiology Investigations which can be found HERE. If further advice is required, please contact the laboratory

## Laboratory Turn Around Time (from Date/Time of Receipt in Laboratory):

Sputum C&S: 90% within 3 days
TB: Microscopy: 3 working days. Same day if urgent.
Cultures: up to 42 days but may take up to nine weeks

RSV Screen: 1 day
Aspergillus DNA PCR: 2 working days
PCP: 3 working days
Respiratory Viruses (SARS-CoV-2, Influenza, RSV): 48 hours

**Time limit for requesting additional investigations:**

7 days
Requests for extra tests must be received within the sample storage period and must be accompanied by a request form. Please telephone the laboratory before requesting extra tests to ensure the sample is available and still viable

**Adverse factors affecting the interpretation of microscopy and culture results**:

- Delays in processing may result in degradation of microorganism which generates results that do not reflect the true clinical situation
- Excessive temperature
- The quality of the result for sputum culture is dependent on the quality of the sample as contamination from upper respiratory tract can affect the result
- Provision of accurate and relevant clinical details to allow correct interpretation of results
- For the initial diagnosis of mycobacterial infection all specimens should be fresh and taken, whenever possible, before anti-tubercular treatment is started. 'Other' antimicrobials may also have significant anti-mycobacterial activity, notably the fluoroquinolones such as ciprofloxacin, levofloxacin or moxifloxacin, and the macrolides such as clarithromycin or azithromycin.

Note: rapid transport to the laboratory is the best way to minimise uncertainty of results

**Specimen Collection:**

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| **Collection Containers** | Sputum: Sterile 70 ml marked container (white top)<br>  <br>BAL, NPA and other specimen types: 20ml sterile universal container:<br>  <br>Nose and Throat Swabs (Respiratory viruses): Viral transport medium |

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| |  <br>Cough swabs: Charcoal transport medium<br>  |
| **Specimen Type** | Nose& Throat swabs, Sputum, Endotracheal or Tracheal Aspirates, Nasopharyngeal Aspirates / Secretions, Cough Swabs, Endotracheal Tips, Bronchoscopy samples, bronchoalveolar lavage (BAL), , bronchial washings |
| **Collection Methods :**<br><br>**Bacterial, Fungal, Virology testing** | Collect specimens before starting antimicrobial therapy where possible.<br><br>**Nose &Throat Swabs:**<br><br>Swab the **Throat** using the plastic shaft swab: swab both tonsils and the posterior pharynx vigorously: start on right site at tonsil and sweep swab around posterior nasopharyngeal mucosa to left tonsil. The patient will likely gag if the specimen is properly taken.<br>Then swab the **Nose** using the same swab: insert into the nostril, parallel to the palate(less than 2.5cm) and leave in place for a few seconds. Then slowly withdraw with a rotation motion. Both nostrils should be sampled with the swab.<br><br>Place the swab in the transport medium and break off.<br><br>**Sputum:**<br><br>Minimum of 1ml required, ideally 2-5ml.<br><br>For sputum specimens the material required is from the lower respiratory tract, expectorated by deep coughing. When the cough is dry, physiotherapy, postural drainage or inhalation of an aerosol before expectoration may be helpful. Saliva and per nasal secretions are not suitable.<br><br>Early-morning sputum samples should be obtained because they contain pooled overnight secretions in which pathogenic bacteria are more likely to be concentrated.<br><br>**Bronchial Alveolar Lavage (BAL)**<br><br>A segment of lung is 'washed' with sterile saline after insertion of a flexible bronchoscope, thereby allowing recovery of both cellular and non-cellular components of the epithelial surface of the lower respiratory tract. It is a reliable method for making a definitive aetiological diagnosis of pneumonia and other pulmonary infections |

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| | **Bronchial Aspirate**<br><br>Bronchial aspirates are collected by direct aspiration of material from the large airways of the respiratory tract by means of a flexible bronchoscope.<br><br>**Tracheal/Endotracheal aspirate**<br><br>Tracheal aspirates are collected via the endotracheal tube. They are subject to the same limitations as sputum specimens<br><br>**Naso-pharyngeal Aspirates (NPA)**<br><br>1. Attach catheter to suction apparatus.<br>2. Tilt patient's head back 70 degrees.<br>3. Insert catheter into nostril. Catheter should reach depth equal to distance from nostrils to outer opening of ear. Stop when you feel a resistance (you have reached the posterior nasopharynx).<br>4. Begin gentle suction.<br>5. Catheter should remain in nasopharynx no longer than 10 seconds. Remove catheter while rotating it gently<br><br>**Cough swab**<br><br>1. Place the tip of the swab into the back of the child's throat (without touching the walls of the throat) and ask the child to cough.<br>**2.** Once you have taken the swab, put the swab stick inside the tube. Press the top of the swab down firmly to make sure it is sealed inside the tube**.** |
| **Collection methods:**<br><br>**Mycobacteria** | **Sputum**<br><br>Sputum specimens should be relatively fresh (less than 1 day old) to minimise contamination. Purulent specimens are best.<br>Two to three samples of ≥5mL should be collected approximately 8-24 hours apart with at least one from early morning. Samples taken early morning (that is, shortly after patient waking) have the greatest yield.<br>When the cough is dry, physiotherapy, postural drainage or inhalation of nebulised saline ('sputum induction') before expectoration may be helpful.<br><br>**Broncho - alveolar Lavage/ Bronchial Washings**<br><br>These may be sent if spontaneous or induced sputum is unavailable or if such specimens are AFB smear negative.<br>NOTE: Contamination of the bronchoscope with tap water, which may contain environmental Mycobacterium species, should be avoided.<br>Minimum sample size is preferably 5mL<br><br>**Gastric Washings**<br><br>Gastric washings are usually used for children where there are problems obtaining sputum. Young children will often swallow their respiratory secretions rather than cough them up. Induced sputum is considered preferable to gastric washings, if possible<br>Collect samples early in the morning (before breakfast) on 3 consecutive days. Preferably, a minimum volume of 5mL should be collected.<br>Aspirates should be promptly delivered and processed to avoid acidic deterioration of organisms. |

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| | Results of direct microscopy on gastric washings can be misleading because other acid-fast bacilli are normally present in the stomach |