

MICROBIOLOGY LABORATORY USER MANUAL

Location of Document

Copy held on Q-Pulse. Document will be published on the Trust Intranet & GP intranet.

CHANGES IN THIS VERSION

The following changes have been implemented:

Section 1:

- Updated screenshot on how to access the Microbiology Schedule of Accreditation from the UKAS website

Section 5:

- Clarification that ZN staining is not available during the out of hours period
- Removal of fast tract vaginal swabs (service no longer available)
- Addition of Rapid CoVID PCR swabs

Section 6:

- Updated to include the regionally agreed MAC, which is being introduced across Northern Ireland. This has been taken forward by the MVSF.

Section 9:

- Microbiology will attempt to contact the ward twice for a positive blood culture. Trust comm published on this 19/02/2021
- Group B Streptococci from a Group B Carriage Screen
- Positive growth from Urgent urine samples from ASW (ward 50). This only applies to those samples received with a "Please phone to" sticker on the request form
- Positive culture result from a sterile fluid

Section 10:

- Removal of parasitology. This service is now provided by the Liverpool School of Tropical Medicine.
- Removal of urinary Schistosomiasis
- Addition of Group B Strep Screen for Carriage
- TAT for corneal scrapes added, as per change request CR3718
- Clarity provided on the blood culture gram stain electronic report

Section 11

- Removal of references to WBC & detection of antimicrobial substances. Routine microscopy no longer carried out due to CoVID restrictions

Section 12

- Information on the culture of Mycobacterium from blood cultures or bone marrow moved to the table for ease of reference
- Belfast Link Labs hyperlink updated

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LOOKING FOR SPECIFIC INFORMATION?

Type the “test name” or a “keyword” in the text search box on the tool bar and press enter- or use “Ctrl+F” keyboard shortcut if search box not displayed

NOTE: IF PRINTED, ONLY VALID ON DAY OF PRINTING

1. INTRODUCTION

Microbiology is an ISO15189 UKAS accredited laboratory.



Medical Laboratory
No. 8841

Our accreditation is limited to those activities described on the UKAS schedule of accreditation. This schedule can be accessed from the [UKAS](#) website. Use the term “8841” to search for accredited organisations in the Who’s Accredited tab

The screenshot shows the UKAS website interface. At the top, there is a navigation menu with 'Who's Accredited?' selected. Below the navigation is a large banner image with the text 'Who's Accredited?'. Underneath the banner is a search bar with the text 'Search' and two buttons: 'Search accredited organisations' and 'Browse by category'. The search bar contains the text '8841'. Below the search bar, there is a search result card for 'Western Health & Social Care Trust Medical Laboratories / 8841'. The card includes the following information: 'Microbiology Laboratory, Antrim Hospital, Glenshane Road, Londonderry BT47 6SP, United Kingdom', 'Telephone (028) 7136311 ext. 213770 / (028) 7136311', 'Email Martin.Robinson@westerntrust.hsc.ni.net', and 'Web http://www.westerntrust.hsc.ni.net/'.

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Microbiology is located within Altnagelvin Hospital, Laboratory/Pharmacy Building, South Block, where it serves the whole of the Western Trust.

Microbiology is directed by a Lead Consultant Clinical Microbiologist and is managed by a Lead Biomedical Scientist. The department offers a full diagnostic service to users in Hospital and primary care. Specialist tests are referred to regional and supra-regional laboratories.

The laboratory offers a comprehensive service, including a 24 hour emergency service. The department processes in excess of 230,000 samples each year. Microbiology follows Public Health England UK Standards for Microbiology Investigations (SMIs) for processing and interpreting of clinical samples. The SMIs are a comprehensive and referenced collection of recommended algorithms and procedures for clinical microbiology. Access to the standard methods publications is via the PHE website [Standards for microbiology investigations \(SMI\) - GOV.UK](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/442222/standards_for_microbiology_investigations_smi_-_gov.uk.pdf)

- Specimens for bacterial culture, wherever possible, should be collected **prior to commencement of antibiotic treatment**
- Actual pus or tissue samples are always preferable to a swab.
- To avoid inadvertent contamination of a specimen during collection, **aseptic non-touch technique** must be used.
- Decontamination of the sampling site or equipment **is** necessary e.g. skin antiseptics before taking blood cultures or cerebrospinal fluids (CSF), or catheter port antiseptics before collecting a specimen of urine via a catheter (CSU).
- Specimens **must** be collected into sterile containers with close fitting lids. **The specimen must be clearly labelled** (see Section 6 for labelling requirements). Once collected, place the specimen into a plastic specimen bag and seal the bag. Wash your hands and dispose of clinical waste into a yellow clinical waste collection bag. Sharps must be disposed of safely.
- Every clinical specimen sent for microbiology examination should be treated as potentially infectious. Standard precautions **must** be observed at all times.

2. LABORATORY CONTACT DETAILS

LABORATORY ADDRESS

Microbiology
South Wing
Altnagelvin Area Hospital
Western Health & Social Care Trust
Glenshane Road
BT47 6SB

TELEPHONE DETAILS

Altnagelvin Hospital Switchboard: (028) 71345171

Name	Position/Comments	Contact details
Dr. G. Glynn Consultant Microbiologist	Clinical Head of Services	Ext. 213776. If not available on this number, contact via their secretary or through switchboard
Dr. C. Armstrong Consultant Microbiologist	Head of Laboratory	Ext. 213774 If not available on this number, contact via their secretary or through switchboard
Martin Robinson	Lead Biomedical Scientist	Ext. 213770 Direct dial number: (028) 71296131 Mobile: 07717 224973 Martin.robinson@westerntrust.hscni.net
Ann Murray	Secretary to Consultant Microbiologists	Ext. 213775 Ann.murray@westerntrust.hscni.net
Main Microbiology Lab	Results/Queries Serology TB/Respiratory Lab Sterile Fluid Room Enteric Pathogens	Ext. 214017 Ext. 213767 Ext. 213769 Ext. 213764 Ext. 213768
Microbiology on- call bleep	For urgent out of hours requests	Contact the Biomedical Scientist via the switchboard
Microbiology on- call mobile number	For urgent out of hours requests. Users are advised to contact switchboard in the first instance	07774 674191

3. OPENING HOURS

Microbiology offers a 24 hour service, 7 days a week, as detailed below:

- Monday to Friday- full service between 9.00am - 5.15 p.m.
- Saturdays, Sundays and Bank Holidays- a limited service between 09.00am- 5.00 pm
- All other times (including Bank Holidays) a 24 hour emergency on-call service is available.

Urgent requests for Microbiology must always be arranged with the Biomedical Scientist. Please contact the department once the sample has been taken at one of the numbers detailed above or via the switchboard for samples taken outside of the normal Laboratory opening hours.

4. AVAILABILITY OF CLINICAL ADVICE

Microbiology offers a consultant led service. Please ensure you have discussed the case/query with a senior colleague and have all relevant clinical information to hand before contacting the Consultant Microbiologist for advice. For out-of-hours advice, contact the Consultant Microbiologist via the switchboard.

5. URGENT AND “OUT OF HOURS” SAMPLES

Only certain tests are available as urgent requests, as listed below. The laboratory must be telephoned to arrange all urgent samples before the specimen is sent to the laboratory. Failure to contact the laboratory will result in the sample being processed as a routine sample. The requesting clinician is responsible for arranging transport of urgent samples to the laboratory:

- CSF examination (microscopy & culture)
- Microscopy & culture of pus or body fluid from normally sterile sites
- Urine microscopy
- RSV
- Corneal scrapings
- Immediate plating and processing of samples where clinical management could be altered by the result.
- MRSA PCR- this is only available to a limited number of patients groups. Consultant Microbiologist approval is required. See WHSCT screening MRSA policy for full details (this can be found on the Trust intranet site, under “Infection Prevention and Control Guidelines”).
- Rapid CoVID PCR swabs meeting the criteria set out in Section 10

PLEASE NOTE: ZEHL-NEELSEN STAINING IS NOT AVAILABLE DURING THE OUT OF HOURS PERIOD. THESE SAMPLES WILL BE PROCESSED THE NEXT DAY

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PLEASE NOTE: THIS SERVICE IS FOR PROCESSING SAMPLES. IT IS NOT A RESULTS SERVICE

6. THE REQUEST FORM/MINIMUM ACCEPTANCE CRITERIA (MAC)

ACCEPTABLE MINIMUM IDENTIFIERS

The following details are required on all request forms. Any requests missing the mandatory information will not be processed

- Mandatory MAC **MUST** be present on **ALL** sample bottle/container and request form to assure sample acceptance for Laboratories and LIMS.
- Desirable MAC **MUST** be considered by the **User** as part of good patient management / care.

	Mandatory	Desirable
Request form	<ol style="list-style-type: none"> 1. Unique identifier Number* 2. Patient Official First Name 3. Surname 4. Sex (Male/Female/Other) 5. Date of Birth (dd/mm/yyyy) 6. Date and Time of Sample Collection 7. Requestor Name/Code 8. Source (Ward/Clinic /GP) 9. Investigation (test) Required 10. Anatomical site and specimen type 	<ol style="list-style-type: none"> 1. Relevant Clinical Information 2. Current antibiotics and / or other relevant medication 3. Patient's address, including postcode if possible 4. Hazard Group 3 (Cat 3) Sticker if applicable (and approp. patient history) 5. Printed name of sample collector 6. MO signature 7. Pregnancy status 8. Contact number (bleep or extension) of requestor in the event of further communication being required i.e. urgent test request
Specimen	<ol style="list-style-type: none"> 1. Unique identifier Number * 2. Patient Official First Name 3. Surname 4. Date of Birth (dd/mm/yyyy) 	<ol style="list-style-type: none"> 1. Sex (Male/Female/Other)

***The Health & Care Number must be used unless:-**

- a) The patient is not registered with a General Practitioner in Northern Ireland – use the local hospital numbering system.**
- b) An emergency situation – use the local hospital EMERGENCY numbering system.**
- c) Other scenarios such as GUM and NSI (needle stick injury).**

Microbiology accepts that the unique identifier (H&C number) may not be available in all cases, e.g. temporary residents, cross border patients. If the H&C number is not available, this **MUST** be clearly stated on the request form or the request will not be processed. Use of the H&C number ensures there are single patient entries on the NIECR and laboratory system. This means all patients' results are stored in the one location. Multiple entries means it will take

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longer to find the correct result and poses significant risks for patients requiring blood transfusions.

Specimens from patients known or suspected to be infected with a Category 3 Pathogen, for example *Mycobacterium tuberculosis*, Hepatitis B virus, HIV or the Enteric fevers must have a hazard warning HAZARD GROUP 3 label, affixed to both the specimen container and request form.

The quality of the report you receive from Microbiology is dependent on the quality of information received on the request form. Clinical details make a difference on the types of organisms which are considered significant. For example, coliforms in a wound swab would not be considered significant unless the patient is diabetic or the sample was from a surgical wound. Without this information the final report will be “No significant growth”. A patient with recurring/persistent sore throat may have an infection caused by an anaerobe which would not be looked for without the clinical details. Audits have shown that 45% of samples received in the department have no clinical details stated on the request forms.

7. COMMON REASONS FOR SAMPLES NOT BEING PROCESSED

- No H&C number on sample and request form
- Unlabelled specimens
- Specimen mismatch (patient details on specimen don't match those on request form)
- Specimens without a test request
- Incomplete or illegible request forms
- Specimens received in a non-sterile container
- Leaking specimens
- Tissue/specimens received in formalin or any other fixative
- Contaminated specimens or request forms
- Swabs with no site stated
- Insufficient urine in a boric acid container
- Urine received in a non-boric acid container which has been taken >4 hours before receipt in the lab and no evidence of refrigeration
- Blood cultures which have been refrigerated
- Samples for MRSA PCR which do not meet the acceptance criteria, e.g. no ward stated, previous history not indicated on the request form

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8. SAMPLE DELIVERY

ALTNAGELVIN HOSPITAL

Specimens are transported by the Portering Service or the Vacuum Transfer System to the Laboratory/ Laboratory Reception. The Laboratory must be contacted regarding all urgent requests.

The address number for the Vacuum Transfer System (VTS) into Microbiology is 850. It is the responsibility of the sender to ensure samples are forwarded to the correct address. Sending a pod to a different address will result in a delay in the sample getting to Microbiology. Samples of tissue/bone/CSF & other non-repeatable sample should NOT be sent via the pneumatic tube.

Several specimens have been sent to the laboratory via the VTS to the laboratories from patients with/suspected HAZARD GROUP 3 pathogens such as HIV, hepatitis B and hepatitis C & CoVID. These samples pose potentially significant risks to the health of the laboratory staff handling the specimens. These samples should NEVER be sent via the VTS. Such samples should always be transported to the laboratories inside sealed, approved transport bags.

NOTE: The use of brown envelopes for transporting laboratory samples from ward/outpatients is prohibited and must not be used.

SOUTH WEST ACUTE HOSPITAL

Each week day (Monday – Friday), a van leaves the SWAH, Enniskillen at 8:50am, calls at Tyrone County Hospital, Omagh at 10:00am and arrives at Altnagelvin Area Hospital at approximately 11:30–12 midday. A second transport run is provided leaving SWAH at 2:00pm, calling at Tyrone County Hospital at 2:45pm to arrive in Altnagelvin Area Hospital at 4:00pm. Specimens are collected at these times and brought to Altnagelvin. Laboratory reports are delivered on the return journey.

On Saturday, Sunday and Bank Holidays, specimens are collected from SWAH at 10:00am and delivered to Altnagelvin Area Hospital by approximately 12:00 midday.

Urgent specimens which arrive outside the normal collection times are transported to Altnagelvin Area Hospital via taxi service. This is organised by the requestor who must also inform the Microbiology Laboratory in Altnagelvin that an urgent specimen has been sent.

SAMPLES FROM OUTPATIENTS AND GP SURGERIES

Pickup and delivery times are detailed in [SPECREC/47]. This policy is available on request. Please contact the department to request a copy of this policy.

9. ELECTRONIC & TELEPHONED REPORT

Microbiology endeavours to report results electronically as soon as the results are available. In order to facilitate the department in producing prompt reports, it is requested that phone calls made to the department are for urgent results only. Please check for the result on the labs system prior to any phone call.

Microbiology reports cell counts for urine directs, fluids & CSF samples electronically. These will be available within 1 hour of the sample being received within the department. The Gram stain following a positive blood culture is also reported electronically.

Listed below are the organisms which the department will phone out to the requestor:


- Positive blood cultures- gram stain, followed by preliminary culture and sensitivity results. Microbiology will attempt to contact the ward twice with a positive, as per the Trust communication, dated 18/02/2021
- Urgent CSF samples- microscopy result will only be phoned if there is an elevated white cell count or organisms present in the Gram stain. There will only be another phone call if there is a positive growth.
- MRSA- 1st isolate from all sites, for hospital inpatients.
- ESβL's- 1st isolate from all sites, except urine, for hospital inpatients.
- VRE/GRE- 1st isolate from all sites, for hospital inpatients.
- CPE- 1st isolate from all sites, for hospital and community patients.
- Group A Streptococci- from wound swabs, ulcers, soft tissue sites, for hospital and community patients.
- Group B Streptococci- Neonatal patients and vaginal swabs from patients with ruptured membranes, in labour ward/delivery suite
- Group B Streptococci from a Group B Carriage Screen
- Chlamydia/gonorrhoeae PCR- positive samples only
- TB- ZN stain, PCR and/or culture positive samples only
- Positive *Legionella* urinary antigen
- Faecal isolates from hospital inpatients. Positive *C. difficile* toxins positive isolates will be phoned to a nursing home (if clearly identified on the request form).
- Positive growth from Urgent urine samples from ASW (ward 50). This only applies to those samples received with a "Please phone to" sticker on the request form
- Positive culture result from a sterile fluid

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Please note: Microbiology receives around 700 samples per day. If you require a result urgently, it is important to contact the laboratory prior to sending the sample. Contact the lab if you require a result to be phoned back on a sample which is not listed above.



Audits in Microbiology have shown that up to 20% of requests into the department have no ward stated on either the request form or sample. Microbiology endeavours to locate these patients in order to alert the ward to a positive result. However, by not including the ward on the request form there will be a delay in this report. On rare occasions it may not be possible to locate the patient, resulting in the message not being relayed back to the ward.


10. SAMPLE CONTAINERS, TEST REPERTOIRE & TURNAROUND TIMES


Sterile universal containers	TAT										
 <ul style="list-style-type: none"> Small volume of urine <i>The preferred container for urine microbiology is the boric acid container (see below). This container should only be used for small volumes. Please note: this MUST reach the lab within 4 hours of production to ensure there is no overgrowth of skin flora. The sample can be refrigerated prior to sending to the lab. Please indicate this on the request form.</i> CSF examination <i>Note: Glucose, protein and xanthochromia are tested in Biochemistry.</i> <i>Normal CSF values.</i> <table border="1" data-bbox="531 878 1225 1173"> <tr> <td rowspan="3">Leucocytes</td> <td>Neonates <28 days</td> <td>0-30 cells X 10⁶/L</td> </tr> <tr> <td>Infants 1-12 months</td> <td>0-15 cells X 10⁶/L</td> </tr> <tr> <td>Children/Adults 1year+</td> <td>0-5 cells X 10⁶/L</td> </tr> <tr> <td>Erythrocytes</td> <td colspan="2">No RBCs should be present in normal CSF</td> </tr> </table> <p>Please note: These values represent the approximate upper and lower limits of normality and are for guidance only.</p> <ul style="list-style-type: none"> Other sterile fluids, for example joint fluid, pleural fluid, ascetic fluid, peritoneal fluid <i>Any sample received for O&S will be cultured and have a gram stain performed. If you require a cell count, please state "cell count & O+S" on the request form. Any request which states cell count only will not be cultured. Cell counts for sterile fluids are reported as number of cells X 10⁶/L (displayed as 10⁶/L)</i> <p><i>Corneal scrapes received as a blade in Brain Heart Infusion broth.</i> <i>Very small volumes of aqueous and vitreous taps, where the volume is too low to be received in a Universal container, may be sent in a syringe. Note: the needle should not be sent Microbiology with the syringe</i></p>	Leucocytes	Neonates <28 days	0-30 cells X 10 ⁶ /L	Infants 1-12 months	0-15 cells X 10 ⁶ /L	Children/Adults 1year+	0-5 cells X 10 ⁶ /L	Erythrocytes	No RBCs should be present in normal CSF		<p>≤ 3 days</p> <p>Urgent cell count telephoned once available. Culture negative results ≤ 3 days Positive results-preliminary result telephoned to the ward. Electronic report ≤5 days</p> <p>Microscopy/cell count phoned on the same day if the sample is urgent. Culture negative results ≤ 5days. Positive culture results: ward contacted</p> <p>12 days</p>
Leucocytes		Neonates <28 days	0-30 cells X 10 ⁶ /L								
		Infants 1-12 months	0-15 cells X 10 ⁶ /L								
	Children/Adults 1year+	0-5 cells X 10 ⁶ /L									
Erythrocytes	No RBCs should be present in normal CSF										

	<ul style="list-style-type: none"> • Pus <i>Pus is preferable to a swab if available. Microscopy and culture carried out routinely. Extended incubation may be required for some samples</i> • Legionella and Pneumococcal urinary antigens <i>Acceptance criteria are in place for Legionella urinary antigen testing. This test will only be performed when specific clinical details are included on the request form</i> <i>For pneumococcal urinary antigen, a CURB-65 score of ≥ 2 must be clearly stated on the request form</i> • BAL samples <i>Microscopy and culture performed on all samples. TB microscopy and culture performed on request only. Indicate the region of the lung the sample has been taken from if more than 1 sample is being sent. For multiple samples, if there is no indication of region of the lung, only 1 sample will be processed.</i> 	<p>Culture results ≤ 5 days</p> <p>1 day. Please note: these tests are not available at the weekend</p> <p>O&S- ≤ 4 days TB- Positive ZN stains will be phoned to the ward. AAFB culture results can take up to 7 weeks. Positive results will be phoned when available</p>
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Universal container with boric acid	TAT
<div data-bbox="293 1391 450 1852" data-label="Image"> </div> <ul style="list-style-type: none"> • 30ml universal container for urine samples <i>Boric acid is added to these containers as a preservative. Boric acid has been shown to kill any bacteria present in the urine if the concentration is too high. Please fill to the indicated line.</i> • Containers with insufficient urine added will not be processed • If the patient can only produce a small volume of urine, please use the white top sterile universal container (see above) <p>Urinary catheters will not be processed.</p>	<p>≤ 3 days</p>


Early morning urine container		TAT
	<ul style="list-style-type: none"> • Urine- for TB culture only. <p><i>PHE standards indicate that microscopy for AAFB in this sample can be misleading due to the presence of non-tuberculous mycobacteria. Microscopy is not performed on these samples.</i></p> <p><i>Samples should be sent on 3 consecutive days.</i></p> <p><i>Please ensure the full early morning urine sample is sent.</i></p> <p><i>Samples received in a sterile universal container will NOT be processed</i></p>	<p>AAFB culture results can take up to 7 weeks. Positive results will be phoned when available</p>
MRSA PCR testing		
	<p>Copan swabs for MRSA PCR testing</p> <p><i>MRSA PCR is only offered to a limited number of users and only available for nasal swabs. In the vast majority of cases, screening by culture is recommended. See WHSCT screening MRSA policy for full details (this can be found on the Trust intranet site, under "Infection Prevention and Control Guidelines").</i></p>	<p>≤ 1 day</p> <p>For urgent tests, the result is available within 90 minutes of receipt of the sample</p>

Universal container with spoon		TAT
	<p>Container to be used for faecal samples only.</p> <ul style="list-style-type: none"> • O&S <i>The lab routinely tests for the following pathogens: Salmonella, Shigella, Campylobacter & E. coli 0157. Patients <16 years also get a stain for Cryptosporidium</i> • C. diff <i>Microbiology has a two- step testing algorithm for C difficile toxin detection. This involves the molecular detection of C. diffilce toxin B gene by nucleic acid extraction/purification. For any sample testing positive for the toxin B gene, confirmation of presence or absence of the toxin is undertaken by immunoassay.</i> <p><i>Minimum of 5mL of sample required. Only liquid samples will be tested (5, 6 or 7 on the Bristol Stool Chart) on the following patients:</i></p> <ul style="list-style-type: none"> - Patients ≥ 65 years - Patients on stated antibiotics - On request <p><i>Patients <2 years will not be tested.</i></p> <p>Send separate samples if requesting C. diff & O&S.</p>	<p>≤3 days</p> <p>30 hours</p>
	<ul style="list-style-type: none"> • Rotavirus & Adenovirus <i>For patients aged <5 years Studies have shown that after the first injection of the vaccine, shedding of rotavirus antigens can occur after 2-14 days post vaccination. If stool samples are collected 15 days after vaccination, the vaccination should not interfere with the diagnostic Rotavirus and therefore only patients infected with the virus will be detected</i> • Parasitology <i>Samples are forwarded to a PHE reference lab in Liverpool</i> <p><i>For investigation of thread worms, a dry cotton swab is required. Samples are best obtained in the morning before bathing. Rub a moistened swab over the area around the anus, but do not insert into the anus. Place the swab in a sterile in a universal container and send to the lab (do not place the swab in transport media).</i></p>	<p>≤3 days Positive rota and/or Adeno phoned to the ward</p>

Wide mouthed universal container		TAT
	<ul style="list-style-type: none"> <p>• Sputum <i>Salivary samples have been shown to be of little value in the diagnosis of URTI. These samples will not be processed.</i> <i>AAFB microscopy and culture performed on request</i></p> <p>• Tissue/bone <i>Please note: consider blood cultures as an aid in the diagnosis of osteomyelitis</i> <i>Extended incubation is required for these samples</i></p> <p>• IUCD <i>These should only be sent for culture if there are clinical indications of PID or other inflammatory conditions.</i> <i>Culture for Actinomyces spp. takes a minimum of 10 days</i></p> <p>• Intravascular cannulae <i>Definitive diagnosis of CR-BSI can only be achieved by culturing the cannulae. Only send the terminal 4 cm of the cannulae.</i> <i>Alternatives to the catheter tip are blood cultures or swabs of the insertion site.</i> <i>DO NOT send urinary catheters- these will not be processed.</i></p> 	<p>O&S ≤ 3 days</p> <p>TB- Positive ZN stains will be phoned to the ward. AAFB culture results can take up to 7 weeks. Positive results will be phoned when available</p> <p>Written/ electronic report 5-10 days</p> <p>≤ 10 days</p> <p>≤ 3 days</p>



Blood culture bottles for O&S		TAT
	<p>Different bottles available, for different patient groups</p> <ul style="list-style-type: none"> • Adult set- use both the FA Plus (aerobic) and FN Plus (anaerobic) set. Ideal volume 8-10 mL per bottle, maximum fill 10mL • For paediatrics, use PF Plus (single bottle). Ideal volume 3-4mL, maximum fill 4mL. <p><i>Bottles are incubated and continuously monitored for 5 days, except in cases of suspected endocarditis (7 days).</i></p> <p><i>For the majority of patients, 2 blood culture sets are recommended as this has been shown to not only increase yield but also allows for the recognition of contamination.</i></p> <p><i>Fever and rigors occur 30-60 minutes after release of the organisms into the blood stream. It is recommended that samples should be taken as soon as possible after a spike in temperature.</i></p> <p><i>For the investigation of endocarditis, 3 or more sets should be taken over a 24 hour period. It is recommended that the maximum 10mL of blood is added to each bottle. The request form should clearly indicate SBE- these are incubated for 7 days rather than 5.</i></p> <p><i>Optimal recovery of bacteria and yeasts is best obtained with the maximum fill of blood is inoculated into the bottles. Under filling of blood can lead to false negative cultures, where the number of organisms remains below a detectable level. It is also important not to overfill the bottles, which leads to false positives. Ensure prompt transport of the bottles to the lab once they have been taken. This ensures maximum recovery of any bacteria/yeasts present in sample.</i></p> <p>DO NOT REMOVE THE DETACHABLE BARCODES FROM THE BOTTLE(S)- FOR LAB USE ONLY</p> <p>DO NOT COVER THE BARCODE WITH THE PATIENT IDENTIFIER</p> <p>DO NOT STICK PATIENT LABELS ON THE BOTTOM OF THE BOTTLE</p>	<p>TAT</p> <p>NEGATIVES: 5 days, except endocarditis (8 days)</p> <p>POSITIVES: Once a bottle becomes positive, an initial Gram stain is phoned to the ward. The gram stain is also available electronically.</p>

Serology Test		TAT
	<ul style="list-style-type: none"> COBAS PCR collection device for <i>C. trachomatis</i> & <i>N. gonorrhoeae</i> Separate collection device available for male and female patients. Follow the printed instructions available with the collection device Samples batched and processed 2 or 3 times per week, depending on demand. 	7 days
	<ul style="list-style-type: none"> Nasal secretions for the detection of RSV Only secretions will be processed. Nasopharyngeal swabs will be sent to the Virus Reference Lab 	1 day
	<ul style="list-style-type: none"> ASOT Titres of <200 IU are considered to be in the normal range ASOT testing is not recommended for the diagnosis of acute pharyngitis. ASOT testing will not be carried out within Microbiology unless the clinical details clearly indicate that a non-suppurative post streptococcal complication is present. 	2 days

Swabs for culture		TAT
	<p>To be used for all swab types for O&S. Types of samples include:</p> <ul style="list-style-type: none"> Throat swabs Samples are investigated for different pathogens if the following are noted on the request form: epiglottitis, quinsy, diabetes, persistent sore throat/treatment failure Check Belfast User Manual for the preferred sample for pertussis testing. 	≤ 3 days
	<ul style="list-style-type: none"> Nasal swabs <i>S. aureus</i> represents normal flora for many patients 	≤ 3 days
	<ul style="list-style-type: none"> Mouth/tongue swabs Investigated for yeast infection only. Indicate if mouth ulcers are present 	≤ 4 days
	<ul style="list-style-type: none"> Eye swabs Eye swabs are of limited value in investigating orbital cellulitis. Ideally a sample of tissue or pus should be sent. Blood cultures may also prove useful. Samples of canaliculitis pus are preferable to eye swabs. Culture for <i>Actinomyces</i> can take up to 10 days 	≤ 3 days

	<ul style="list-style-type: none"> • Ear swabs <i>Swabs taken from the nasopharynx for the diagnosis of ear infections are inappropriate and will not be processed. External ear swabs are not useful in the investigation of otitis media unless there is perforation of the eardrum.</i> • Skin/ulcer swabs/superficial wound sites <i>Indicate if the patient is diabetic. Note if the skin is broken. Blood cultures are the preferred specimen in cases of cellulitis when the skin is not broken</i> • Abscess/Wound swabs <i>If there is no indication of a surgical wound, these samples will be treated as superficial wounds. Surface wounds and sinuses are often colonised with environmental bacteria which may not reflect the cause of the infection. Where possible, pus from the wound should be sent to the lab.</i> • Vaginal swabs/swabs for genital tract infections <i>Please note, HVS samples are not suitable for the detection of gonorrhoea. Consider sending sample for N. gonorrhoeae PCR detection or a cervical swab for culture. Some bacteria are only considered significant during pregnancy. It is important to indicate if the patient is pregnant on the request form. HVS samples are not suitable for the diagnosis of PID. Pus from the fallopian tube or TOA, or peritoneal fluid are the preferred samples. Bacterial vaginosis (BV) diagnosis is carried out by microscopy. This is the most sensitive method for detection of BV as it detects both clue cells and the disturbance in bacterial morphotypes associated with BV. If detected by microscopy, the report will state Microscopy suggests bacterial vaginosis. Investigation for BV is carried out on patients of childbearing age with clinical details indicating vaginal discharge</i> <p><i>Any request where both O&S and Trichomonas are requested and where only one swab is received, only the O&S will be processed. Requests for both O&S and Trichomonas should be sent to the lab in the following way:</i></p> <ul style="list-style-type: none"> ➤ 2 swabs. One to be used for O&S and the other for Trichomonas culture ➤ 1 swab for O&S and a different swab already inoculated in the Trichomonas culture broth 	<p>≤ 4 days</p> <p>≤ 3 days</p> <p>≤ 3 days</p> <p>≤ 3 days</p>
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	<ul style="list-style-type: none"> • MRSA screening swabs <i>Consult the Trusts MRSA Screening and Treatment Guidelines for sample requirements. Policy available on the Trust Intranet site.</i> <i>Antibiotic sensitivity will only be determined for patients with no previous history of MRSA or who have not been positive within the last 3 months. Check for previous records on Labs recall if the antibiotic sensitivity pattern is not displayed.</i> • Other screening swabs, e.g. Pseudomonas screens, VRE screening, Resistant Enterobacteriaceae <i>These will only be processed for certain wards & situations. Such screens MUST be pre-arranged with the lab before testing begins</i> • Group B Streptococci Screen for carriage <i>This is only available if the patient has had a Group B Strep isolated in a previous pregnancy. 1 swab required (combined LVS and anorectal swab). HVS samples are not suitable and will not be processed</i> 	<p>≤ 3 days</p> <p>≤ 4 days</p> <p>≤ 3 days</p>
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Swab for respiratory virus		TAT
	<ul style="list-style-type: none"> • Flu A, Flu B & RSV testing <p>This assay used is an automated, multiplex RT-PCR intended for the <i>in vitro</i> qualitative detection and differentiation of influenza A, influenza B and respiratory syncytial virus</p> <p><i>A specific nasopharyngeal swab is required for testing. Samples received on other swab types cannot be tested.</i></p> <p><i>This service is available from Monday-Friday, from 9am until 3pm. Samples received after 3pm will be processed on the next working day. This service is not available at the weekend or during the on call period. Results will be available electronically. Microbiology will not be telephoning results to the ward.</i></p> <p><i>The following criteria must be met before a Flu test is requested and this information MUST be clearly stated on the Request form:</i></p> <p style="padding-left: 40px;"><i>Pyrexia >38°C or history of fever AND 2 or more of cough, sore throat, rhinorrhea, limb/joint pain, headache</i></p> <p><i>NOTE: this test is only for influenza A, influenza B and respiratory syncytial virus. It does not cover all respiratory viruses. If testing is required for other viruses, please check with the Regional Virus Lab on sample requirements.</i></p> <p><i>This test is reported as positive or negative for each virus. If any sample has a CT (cycle threshold) of >35, the following comment is added:</i></p> <p style="padding-left: 40px;"><i>CT values of 35-40 should be treated with caution.</i></p> <p><i>For further information on interpreting this result, please contact the Consultant Microbiologist</i></p>	<p>Available from October-March</p> <p>Same day reporting if received before 4pm.</p> <p>Next working day for samples received after 4pm</p>
	<ul style="list-style-type: none"> • Rapid SARS CoV-2 testing <p>This assay used is a RT-PCR intended for the qualitative detection of nucleic acid from SARS-CoV-2</p> <p><i>A specific nasopharyngeal swab is required for testing. Samples received on other swab types cannot be tested.</i></p> <p><i>This service is available from Monday-Friday, from 9am until 7pm. For Saturday, Sunday & a Bank Holiday, the service is available from 9am to 3pm. Please contact the lab in advance of sending the sample to ensure the sample is processed urgently.</i></p> <p><i>Results are for the identification of SARS-CoV-2 RNA. Positive results are indicative of the presence of SARS-CoV-2 RNA; clinical correlation with patient history and other diagnostic information is necessary to determine patient infection status. Positive results do not rule out</i></p>	<p>Same day reporting if received before the testing cut off time.</p> <p>Next working day for samples received after the testing cut off time</p>

	<p><i>bacterial infection or co-infection with other viruses. The agent detected may not be the definite cause of disease. Negative results do not preclude SARS-CoV-2 infection and should not be used as the sole basis for treatment or other patient management decisions. Negative results must be combined with clinical observations, patient history, and epidemiological information.</i></p>	
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Turnaround times are from receipt by the Laboratory to result availability. It is anticipated that these turnaround times will be achieved for 90% of specimens. However, due to the nature of microbiology, some results may take longer. Please also be aware that turnaround times may be elongated by up to 2 days if specimens require work over the weekend/bank holiday.

For information on how samples should be collected, to prepare a patient for the collection of samples, please refer to the following website www.labtestsonline.org.uk, or follow the link below:

[Lab Tests Online-UK: Welcome!](http://www.labtestsonline.org.uk)

11. INTERPRETING LABORATORY RESULTS

URINE BACTERIAL GROWTHS

Bacterial growths of $\geq 10^5$ colony forming units/mL (cfu/mL) are consistent with infection and counts below this usually indicate contamination. A pure growth (single organism) with counts between 10^4 and 10^5 cfu/mL need to be evaluated based on clinical information or confirmed by repeat culture. Interpretation of these culture results must be made with care and take into account adverse factors in specimen collection and transport. The probability of UTI is increased by the isolation of the same organism from two specimens. Urines which contain more than a single organism usually indicate contamination.

Microbiology reports urines in the following manner:

- For a colony count $< 10^4$ cfu/ml- Negative
- For a colony count of a single organism of $> 10^5$ cfu/ml- Significant. Antibiotics are reported
- For a colony count of 2 or more single organisms of $> 10^5$ cfu/ml- this will be reported as Mixed Growth.
- For a colony count of a single organism between 10^4 - 10^5 cfu/mL- Equivocal. Antibiotics are reported. These reports need to be evaluated on the basis of the clinical presentation of the patient or confirmed by repeat culture
- Isolates of Group B Strep $< 10^4$ cfu/ml are noted on the final report. Antibiotic susceptibility is not performed for these samples

Microbiology uses the calibrated loop technique to culture urine samples and quantify the bacterial count. Microbiology does not routinely screen for colony counts below 10^4 cfu/mL

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ADDITIONAL ANTIBIOTICS

To aid with antimicrobial stewardship, Microbiology reports a limited number of antibiotics for each organism. In most cases, further antibiotics are available. If the patient is on a specific antibiotic, or you are considering an antibiotic which is not listed on the Microbiology report, please contact the lab. In all cases, patient treatment should be detailed on the request form.

NON-0157 E. COLI FROM FAECES

Currently Microbiology can only culture faeces samples for *E. coli* 0157, which accounts for around half of the verocytotoxin *E. coli* (VTEC) infections. Other serotypes of VTEC are known. In cases where there are appropriate clinical symptoms, but are culture negative for 0157, samples will be sent to a Reference lab for further testing. These require relevant clinical details to be included on the request form.

C DIFFICILE REPORTING FORMAT

C. difficile toxin testing in Microbiology is carried out using a two step algorithm. The first step involves the molecular detection of *C. difficile* toxin B gene by nucleic acid extraction/purification. For any sample testing positive for the toxin B gene, a reflex confirmation test for the presence or absence of the toxin is undertaken by immunoassay.

The following algorithm is used to report samples sent to Microbiology for *C. difficile* toxin detection:

<u>Laboratory Result</u>	<u>Result reported on laboratory computer system. (Mask Code).</u>	<u>Comments added to the report</u>
<i>C.difficile</i> PCR negative	<i>C. difficile</i> Toxin- Not Detected	
<i>C. difficile</i> PCR positive, followed by Quik Chek toxin positive	<i>C. difficile</i> Toxin Detected	
<i>C.difficile</i> PCR positive, followed by Quik Chek toxin negative	<i>C. difficile</i> Toxin- Not Detected	<i>C.difficile</i> toxin B gene detected by PCR. No lab evidence of the presence of Toxin producing <i>C. diff.</i> Clinical Microbiology advice available if required.

12. SAMPLES REFERRED TO OTHER LABORATORIES

Where possible, samples are only sent to accredited laboratories. Tests are either referred to other labs within Northern Ireland, or to national reference centres. All of the Referral labs used by Microbiology are accredited to ISO15189. A list of the current accreditation status for each of the referral labs is maintained by Microbiology, and is available on request.

TESTS REFERRED TO LABORATORIES WITHIN NORTHERN IRELAND

The Regional Virus Reference Laboratory, Regional Immunology Laboratory, Regional Mycology and Regional Medical Genetics are part of the Belfast Health and Social Care Trust. All requests will be transported to the Belfast trust from the Laboratory daily at 8am. This service is Monday to Friday only.




For the further details on the service provided by the Belfast Health and Social Care Trust Laboratory, including tests, specimen requirements and result interpretation, please see the Belfast Health and Social Care Trust Laboratory User Manual, available from the Belfast Health and Social Care Trust website. [Laboratory Services | Belfast Health & Social Care Trust](#)


Please note: it is the responsibility of the ward to check with the referral lab if an urgent sample will be processed. The cost of sending urgent requests outside of the normal delivery service will be charged to the requesting department

vary for each test. Please follow the link for individual user manuals, request forms and sample containers:

[Specialist and reference microbiology: laboratory tests and services - Detailed guidance - GOV.UK](#)

MISCELLANEOUS TESTS REFERRED TO OTHER LABS

TESTS/DISEASES	REFERRAL LABORATORY	SAMPLE TYPE & COMMENTS
Pertussis PCR	Dept. of Medical Microbiology Kelvin Building Royal Victoria Hospital	Nasopharyngeal secretions, sputum, BAL, dry throat/nasal swab. Do not use gel/charcoal swabs
Leptospira IgM ELISA	Dept. of Medical Microbiology Kelvin Building Royal Victoria Hospital	 5-10ml clotted blood IgM antibodies can already be detected two days after the onset of symptoms. These antibodies are detectable in all patients up to five months after infection.
Mycobacterial investigations to include <i>Mycobacterium tuberculosis</i> and disseminated <i>Mycobacterium chimaera</i>	Dept. of Medical Microbiology Kelvin Building Royal Victoria Hospital	 1- 5ml of blood or bone marrow in Myco/F Lytic culture vials. These are held in Microbiology Laboratory, Altnagelvin, and are available on request. Inoculated bottles should be transported to BHSCT Microbiology Lab as soon as possible. Note: Clinicians sending samples for mycobacterial investigations should include on the laboratory request form where relevant: <ul style="list-style-type: none"> • History of cardiac surgery Or <ul style="list-style-type: none"> • Under investigation for possible disseminated <i>Mycobacterium chimaera</i> infection
Toxoplasma gondii IgM & IgG	Dept. of Medical Microbiology Kelvin Building Royal Victoria Hospital	 5-10ml clotted blood Depending on clinical history and screening result samples may be sent off to the Toxoplasma reference Laboratory for confirmation and Dye Test

Teicoplanin	Biochemistry Ulster Hospital	 5-10ml clotted blood Service offered 9am-5pm, Monday to Friday. Results available via NIECR
Interferon gamma release assay (QuantiFERON® - TB Gold IT)	HPA Mycobacterium Reference Unit	Contact the lab for correct sample containers, request form and instructions. Samples MUST be pre-incubated in the lab before sending. Samples will only be accepted on a Monday, Tuesday and Wednesday. Please ensure the request form is completed in full.
<i>Acanthamoeba</i>	London School of Hygiene & Tropical Medicine	Corneal scrapes (without blade) or contact lens should be added to 200µl of sterile saline for transport to Referral laboratory

13. PROTECTION OF PERSONAL INFORMATION

Microbiology follows the Western Health & Social Care Trust Data Protection and Confidentiality Policy (Reference Number Corp 11/003), which is available on the Trust Intranet.

14. LABORATORY COMPLAINT PROCEDURE

Microbiology follows the Western Health & Social Care Trust Data Protection and Confidentiality Policy (Reference Number Med 11/009), which is available on the Trust Intranet.

Service users are encouraged to provide feedback to the laboratory. If you have a compliment or complaint, please contact a member of the laboratory team who will attempt to rectify the issue.

15. UNCERTAINTY OF MEASUREMENT (UoM)

Microbiology has calculated the UoM for some tests, results and procedures, for example cell counts. These are available to users on request. A formal request must be made to the Lead Biomedical Scientist who will supply a copy of the current UoM calculations if available.

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