

Microbiology Laboratory User Guide

Version number 20.0

Author Newara Ramadan/ Florina Mamaische

Authorised by Imogen Jones/ Sara Murthy

Issued on July 2025

| Version Number | Change Details | Date |
|----------------|--|------------|
| 19 | Update on Synnovis template. Update to remove references to Winpath, EPR, ICE It system, Mycoplasma test, Adenovirus Serology and Enterovirus serology tests have been discontinued | 09/07/2024 |
| 20 | Updated to reflect changes in structure and move of services to the Blackfriars Hub | 23/07/2025 |

Contents

| | |
|--|-----------|
| 1. Location of the laboratories & service summary | 3 |
| 2. Contact details for laboratory enquiries and for key members of staff | 6 |
| 3. Opening times and Out of hours service | 6 |
| 4. Availability of clinical advice on ordering examinations & on | 7 |
| interpreting results..... | 7 |
| 5. Information on Samples and Tests and sample acceptance / rejection | 8 |
| guidelines | 8 |
| 6. Factors that may affect performance of the sample examination or interpretation of the results, including measurement of | 15 |
| uncertainty | 15 |
| 7. Instructions for Completion of Request and Transportation of | 16 |
| Samples including requirements for patient consent..... | 16 |
| 8. Microbiology department test repertoire & test turnaround times & applicable reference ranges | 19 |
| 9. Addresses of Referral Laboratories and list of tests referred..... | 43 |
| 10. The Laboratory's policy on protection of personal information | 51 |
| 11. The Laboratory's complaint procedure | 51 |

1. Location of the laboratories & service summary

The Microbiology department for the Royal Brompton & Harefield NHS Foundation Trust is centralised on the Royal Brompton site:

Department of Microbiology
Royal Brompton Hospital
Sydney Street,
Chelsea
London SW3 6NP

Microbiology samples from Harefield patients are transported on a weekday using the cross-site bus, which leaves Harefield daily at 10:00, 12:00 and 16:00, and an additional courier collection occurs from the Laboratory Medicine block at Harefield at 17:30. Courier collections from the Laboratory Medicine Block at Harefield also take place at 11:30 on every Saturday, Sunday and Bank Holiday.

For out of hours urgent sample requests from either site please contact the Microbiology On-Call Biomedical Scientist.

The Microbiology Department provides a comprehensive consultative, analytical and interpretive service to Royal Brompton and Harefield NHS Foundation Trust. The service offers a wide range of specialist bacteriology, virology and fungal diagnostics including cystic fibrosis and transplant bacteriology, mycobacterial identification and susceptibility testing, molecular PCR assays and serology assays. The laboratory also provides a microbiology culture service to the Heart Valve Bank based on the Brompton site.

The agreement between the laboratory and its' users is defined by the laboratory accepting the user's request for laboratory testing.

Details of services offered in-house include:

Bacterial microscopy, culture and sensitivity testing including: ○

Blood cultures & tips / line cultures ○ Bacteriology culture on swabs, fluids and tissues including:

- Respiratory samples including cystic sputa, routine sputa, bronchoalveolar lavage and pleural fluids
- Heart valves / lung tissues / biopsies / pericardial fluid
- Other sterile / non sterile tissues and body fluids
- Urines
- Faecal cultures for enteric pathogens & ova, cysts / parasites
- Wound swabs

- Genital samples
- Cerebrospinal fluids

MRSA screening, CRE / VRE screening, *Candida auris* screening

Environmental / Sterility investigations

- Heart Valve Homograft sterility checks

Mycobacterial investigations including:

- Microscopy for Acid Fast Bacilli
- Rapid detection of *Mycobacterium* species using a Liquid Culture system
- Identification and sensitivity testing of both tuberculous (TB) and nontuberculous *Mycobacterium* (NTM) species.
- Rapid Nucleic Acid Amplification test for isoniazid and rifampicin resistance in *Mycobacterium tuberculosis* complex.
- Subspeciation and molecular resistance detection of the *Mycobacterium abscessus* complex.
- Subspeciation and molecular resistance detection of the *Mycobacterium avium intracellulare* complex.

Mycology investigations including:

- Microscopy and fungal culture of respiratory samples
- Extended culture for systemic fungal infections
- Anti-fungal susceptibility testing of specific fungal isolates.
- Fungal culture of skin / hair / nail samples
- Microscopy and culture for dermatophytes

Virology / Microbiological antibody/antigen detection including.

From **23 June 2025** all **serology tests performed on blood samples** - including microbiology and virology for both inpatients and outpatients – **have moved to the hub.**

These tests are as follows:

- Anti-streptolysin-O (ASO)
- Borrelia IgM & IgG
- CMV IgG & IgM antibodies
- CMV Avidity
- EBV IgG & IgM antibodies
- Hepatitis A IgM
- Hepatitis B Surface Antigen
- Hepatitis B Surface Antibody
- Hepatitis B Core Antibody and Core IgM
- Hepatitis B e Antigen, Hepatitis B e Antibody
- Hepatitis C Antigen and Antibody
- HDV IdM & IgG

- HEV IgM & IgG
- Herpes simplex IgG antibodies
- HIV 1 & 2 antibodies
- HTLV 1 & 2 antibodies
- Measles IgG antibodies Parvovirus IgM & IgG
- Rubella IgM & IgG antibody
- Syphilis total (IgM & IgG) antibodies
- SARS CoV 2 Spike IgG
- Toxoplasma IgG & IgM antibodies
- VZV IgG antibody

Serology tests that are still performed on site:

- B-D-Glucan
- Galactomannan
- Clostridium difficile (Toxin and GDH antigen) testing
- *Legionella pneumophila* type 1 urinary antigen
- Pneumococcal (*Streptococcus pneumoniae*) urinary antigen
- Rotavirus & adenovirus faecal antigens

Molecular diagnostic and mass spectrometry investigations also include:

- MALDI-tof (Matrix Assisted Laser Desorption Ionisation time of flight) rapid identification of organisms.
- Viral Respiratory PCR (Polymerase Chain Reaction) for Influenza A (including H1N1), Influenza B, Parainfluenza 1, 2 3 and 4, Human Metapneumovirus A & B, Respiratory Syncytial Virus A & B, Adenovirus, Enterovirus, Parechovirus and Rhinovirus/. Enterovirus
- Respiratory PCR for *Pneumocystis jirovecii*, *Legionella pneumoniae*, *Chlamydia psittaci*, *Chlamydia pneumoniae*,
- Respiratory PCR for *Mycoplasma pneumoniae*
- SARS-CoV-2 PCR
- CMV DNA

Reference Laboratory Utilisation

Many investigations including some molecular diagnostic tests are available at various reference facilities throughout the United Kingdom. If an investigation you require is not on this list of tests we do in-house, we will receive the specimen in our laboratory and refer it to the most appropriate reference facility. **In this situation, full clinical details are required and some tests require, a “pre-arranged request on provision of relevant clinical details”, with the Consultant Microbiologist before being accepted by the Reference Laboratory for testing.** A list of the tests we refer out and the addresses of the laboratories we refer to are given in section 10.

2. Contact details for laboratory enquiries and for key members of staff

| NAME | CONTACT NUMBER |
|---|--|
| To contact us regarding laboratory enquiries : | At the Brompton Ext. 88451 |
| Head of Department Consultant Microbiologist Dr Imogen Jones | RBH Ext 82972 |
| Consultant Microbiologist Dr ELDA RIGHI Dr LUCY SOWOLE Dr. SARA MURTHY | RBH Ext 88440 HH Ext 85245 HH Ext 85728 |
| Consultant Virologist: As per St. Thomas on call virology rota | Contact via Switchboard 020 7188 7188 |
| Director of Infection and Prevention Control Dr JON OTTER | Telephone 0207 188 3152 Ext 83152 |
| Microbiology Service Manager: Sushma Enjam | Ext. 88446 |
| Biomedical Scientist Leads: BACTERIOLOGY LAB: ALI NUH KAREN WEEKES VIROLOGY/SEROLOGY LAB: ASHFAQ BASHIR MYCOBACTERIOLOGY LAB & H&S officer: SUSHMA ENJAM Microbiology Quality Co-ordinator Vacant | Ext. 88451/88254 Ext. 88449 Ext. 88450 Ext. 88451/88254 |

3. Opening times and out of hours service

Regular working hours are Monday to Friday, 8 am to 8 pm, and Saturdays, 9 am to 1 pm. A weekend testing service is at present only offered for virology daily SARSCoV2 PCR tests, for other respiratory PCR weekend service is available between the months of October and April inclusively.

On a Sunday and a Bank Holiday the department offers a service from 9am until 2pm for the reading and processing of both routine and urgent work and from 2pm an emergency on-call service is provided.

If **urgent** investigations are required outside these times, there is an emergency oncall service available from **8pm to 9am on a weekday and from 1pm on a Saturday until 9am on a Monday morning**. The Biomedical Scientist on-call can be contacted via the switchboard (please ask to be put through to the Microbiology on-call Biomedical Scientist).

Samples that will be accepted as urgent on-call requests include: CSF, Bronchoalveolar lavages (BALs), pleural and pericardial fluids and urgent microscopy / culture on biopsies / tissues.

Other requests for urgent out-of-hours analysis will require approval by **the on-call Consultant Microbiologist** in order to agree urgent processing. Please contact the Royal Brompton switchboard on **+44(0) 20 7352 8121** and ask to be put through to the on-call Consultant Microbiologist. Please note for out-of-hours needlestick advice please refer to the intranet <http://www2.rbht.nhs.uk/how-to-guides/trust-documents/>

All authorised Microbiology results are available on the EPIC system. Passwords and instructions on using the enquiry programme can be obtained from the Trust Information Services Department.

4. Availability of clinical advice on ordering examinations & on interpreting results

The Clinical Microbiology Service is a consultant led Service. The Microbiology Consultants provide information and advice on the management of infection and infection prevention via the telephone, face-to-face at clinical ward rounds, at Multi-Disciplinary Team (MDTs) meetings and on an ad-hoc basis at the patients' bedside or at outpatient clinic review, where needed. The advice given is noted in a number of different ways which include electronically via the Laboratory Information System (EPIC). Alert organisms or urgent results are communicated in a timely manner to clinical teams via the telephone, via EPIC messaging or via the Trust email system.

Clinical advice is available via switchboard on both Royal Brompton and Harefield sites during the day from Monday to Friday 9am - 5pm. After 5pm on a weekday and at weekends / bank holidays clinical advice is available in accordance with the Consultant Microbiologist out-of-hours rota available through the switchboard. Out-of-hours advice provided by a 1 in 5 Consultant Microbiologist rota.

Contact details for Dr Sara Murthy: HH Ext- 85728
Mobile 07814 553 640
Aircall 07623 890 735

Contact details for Dr Lucy Sowole HH Ext - 85245
Mobile 07432363971

Contact details for Dr Imogen Jones RBH Ext – 82972
Mobile 07811596428

Contact details for Dr Elda Righi RBH Ext- 88440
Mobile 07393574516

5th person on rota is seconded from GSTT rota – changes every three months.

5. Information on Samples and Tests and sample acceptance / rejection guidelines

Specimens for routine examination should be in the laboratory on weekdays by 17.00. Any urgent requests must always be telephoned to the laboratory before being sent.

Gram stains are **not done** routinely on all samples. If required, please telephone the Microbiology Department.

Please try to send as much sample as possible for the size of container/s (without overfilling the sample pots and making them unsafe). The laboratory will attempt to test all samples but on occasion there might be insufficient sample sent for the tests required. If unsure that the sample size is sufficient, please contact the laboratory for advice.

The interpretation of results is dependent on the clinical information provided, therefore please make sure that the **relevant clinical information is provided and that the site that the sample was taken from is always supplied**, together with **current antibiotic therapy information** on the request form, this enables the relevant tests to be performed and ensures results are interpreted appropriately.

Information on sample requirements for specific samples are given below and on the intranet in the **Microbiology Specimen Collection Instructions leaflet** (including requests for additional tests where appropriate):

[Microbiology at the Royal Brompton and Harefield Hospitals | Synnovis](#)

CSF - must be sent in sterile 30ml containers (universals). If more than one sample is taken (and Biochemistry tests are also requested) please ensure that the Microbiology Laboratory receives the last sample as this is the least likely to be contaminated by organism or blood. **ALWAYS inform the laboratory when a CSF is going to be taken and send it to the laboratory immediately.** Microscopy is available within one hour of receipt of the sample; preliminary culture result after 1 day; final culture result 23 days. Further tests (other than those specified on the request form) can be requested up to 7 days after sending the samples, however not all additional investigations can be performed on very scanty samples.

Blood cultures – each adult set consists of two bottles and paediatric bottles are available. At Harefield the bottles are available on most wards or from the Laboratory Specimen Reception in the Pathology / Laboratory Medicine block. At the Brompton Blood culture sets are available in the Biochemistry /Haematology laboratory corridor for collection by a porter and paediatric bottles are available on the paediatric wards. Boxes of paediatric bottles are available to order direct from microbiology.

Blood for blood cultures should be taken using aseptic techniques using the standard blood culture collection pack (information can be found on the intranet at <http://www2.rbht.nhs.uk/services/infection-control/resources/>)

and all blood culture samples should be sent to the laboratory for incubation as soon as possible after collection. **Do not refrigerate** the blood culture samples after collection.

Blood cultures are loaded onto an analyser that continuously monitors the bottles for positive reactions. Those bottles that flag positive will be processed as soon as possible and the Gram stain results from positive bottles given to the Consultant Microbiologist for communication to Medical Staff.

Urines must be sent in sterile 30 or 60ml containers. Send MSU (mid-stream urine) samples (as this decreases the amount of skin/faecal contamination) or urines via urinary catheter. Further tests can be requested for up to 24 hours after the receipt of the samples. Investigation of **urine for AFB** requires three consecutive early morning urines. Investigation for **Legionnaires disease** also requires a urine sample, and a urine sample may also be sent for **Pneumococcal antigen** in cases of community acquired pneumonia.

Catheter tips and pacing wires - send approximately 5cm of the distal end of the catheter/wire by aseptically clipping off the end directly into sterile 60ml containers. **NOTE: Urine catheter tips are NOT tested. Further tests can be requested for up to 7 days after the receipt of the samples.**

Faeces must be sent in 30 or 60ml containers or designated faeces collection pots (blue containers with spoon). On the request form, please state details of any recent overseas travel and the reasons for requesting the tests. Examination for ova, cysts and parasites and cryptosporidia will **only** be made if the clinical details indicate the requirement and/or if specifically requested. Further tests on faeces can be requested for up to 7 days after the receipt of the samples. A faeces sample is also required for when *Helicobacter pylori* infection is suspected. **If an outbreak of diarrhoeal infection is suspected, please inform the Infection Control team and the microbiology laboratory as a full enteric viral PCR screen performed at an external lab may be required.**

Examination for *Clostridium difficile* testing will **only** be carried out on: **Faeces on patients >2 years old which meet the criteria of Bristol Stool chart Type 5-7 that are liquid or semi-formed (i.e. those samples that take the shape of the container), all cystic fibrosis patients faeces where specifically requested, and any patients with a diagnosis of pseudomembranous colitis or antibiotic associated disease and / or whenever specifically requested by a clinician.** Requests for *Clostridium difficile* testing are only valid on samples up to 24hrs old.

Tissues / biopsies, fluids, sputa, Bronchoalveolar Lavages (BALs), and Nasopharyngeal Aspirates (NPAs), must be sent in sterile 30 or 60ml containers. Do not use containers that contain fluid or add any fluid unless sample collection involves washing with sterile fluids. **All samples with suspected Hazard Group 3**

Pathogens e.g. *Burkholderia pseudomallei*, *Coccidioides immitis*, must have this information included in the clinical details. **For BALs and NPAs please send a separate sample/ request if virology investigations are required.** Sputum samples from **cystic fibrosis** and those from **lung transplant** patients **must be labelled as such** as they are processed and cultured for extended pathogens such as for *Burkholderia cepacia* and fungal culture. Further tests on fluids, sputa, BALs and NPAs can be requested for up to 7 days after the receipt of the samples. Further tests on tissues / biopsies can be requested for up to a month after receipt of the sample assuming some sample remains after initial processing.

Culture swabs (including infection control screening) must be used for the collection of specimens and transported in the Transwab *Amies* media which help to sustain the viability of both aerobic and anaerobic organisms. **Please always state the SPECIFIC SITE of the swab.** Gram stains are only done on sternal wound swabs, on abscess swabs and on deep or post-operative wound swabs from sterile sites and on CABG leg swabs, CABG donor site swabs, Saphenous vein site swabs, pocket site swabs, implant device site swabs and pacemaker wound swabs. Further tests can be requested for up to 7 days after the receipt of the samples.

N.B For culture of suspected *Bordetella pertussis* infection a special charcoal PERNASAL swab is required. Please contact the microbiology laboratory to arrange for it to be obtained.

Skin, nails, hair etc for fungal investigations – take skin scrapings using sterile scalpels, and hair or nail samples using sterile scissors or clippers. Place in sterile 60ml pots (or use designated mycology sample collection packs “Dermapak”).

Requests for Mycobacteria / Acid Fast bacilli (AFB)

Please make **specific requests for AFB when required**, however certain samples will always be routinely cultured for AFB. It is advisable to **send a separate request form/ ICE request /specimen for mycobacteria / AFB** whenever possible. Urgent AFB smears can be done by prior arrangement with the laboratory. All specimens for mycobacteria requests are set up for AFB microscopy and culture. Identification and sensitivity tests on mycobacteria are performed on positive cultures according to local standard operating procedures. Clinical material for the investigation of mycobacteria / AFB should be collected before the start of any treatment.

If there is clinical suspicion of pulmonary tuberculosis / mycobacteria infection, 5 to 10ml of early morning sputum should be collected in a wide lipped sterile container on at least two consecutive days. It must be collected aseptically into the sterile container to avoid contamination with nontuberculous mycobacteria (NTM) which also reside in tap water, **use of tap water to help to take samples or for mouth rinsing must be avoided.**

The TB laboratory also offers a nucleic acid amplification test that detects the presence of MTB complex directly from **AFB smear positive** specimens. It also detects

mutations in the *rpoB* gene that code for rifampicin resistance and mutations in the *inhA* and *katG* gene which code for isoniazid resistance. The test takes 8 hours to perform. Clinical consultation when requesting this test is essential. Please contact the Consultant Microbiologist or the Lead Biomedical Scientist in the TB laboratory on Ext 88440 or 88450 for further advice / guidance.

Virology / Serology / Molecular diagnostic requests

Some molecular and serology virology investigations are performed by the department; however, many serology investigations have now been moved to the hub. Some specialised tests are still referred to external reference laboratories (see Section 10). It is essential that only necessary specialist tests are requested following prior consultation with the Consultant Microbiologist, as some referral laboratory results can take up to three weeks. Additionally, inappropriate test requesting may lead to significant cost implications for the Trust.

N.B Requests for an extended panel of fungal antibodies should be accompanied by details of recent travel abroad and or specific clinical indication of disease. Samples for parasite serology are also referred to specialist laboratories and therefore up to 2 weeks may elapse before results are available. **A brief summary of the patient's clinical condition and travel history enables appropriate tests to be considered.**

Always state which viral / serological investigations are required. Testing of samples will be delayed if specific tests are not requested and/or relevant clinical information is not received.

6ml clotted blood samples are required for all routine serology tests unless indicated in the table in section 7. Also refer to the Vacutainer Blood Tube Guide instructions held by the Phlebotomy department. Instructions and training for taking samples is under the remit of the Phlebotomy Department.

6 ml Lithium heparin bottles are required for Elispot testing.

3ml EDTA bottles are required for virology PCR and viral load assays.

For further information on specific virology / serology sample requirements please call the Virology Lead Biomedical Scientist on **Ext 88449**.

Please note that haemolysed and lipaemic samples may interfere with some assays and a comment will appear on the final report. Serum samples from most assays are retained for one month. If further tests are required, please contact a member of the senior staff in the virology section.

All **ELISPOT** requests are sent each day to Oxford Immunodiagnostics in Oxford, and the time required for them to be received in the microbiology lab is critical in order that the fresh sample is tested that day.

| Test requests | Type of sample | Day and Time that fresh sample is required in Microbiology lab |
|---------------|-----------------|---|
| ELISPOT | Lithium Heparin | Monday to Friday before 16:00 at Harefield, and 17:00 at the Royal Brompton. Please telephone the lab on Ext 88449 to inform if samples are taken after 16:00. |

Samples for virology respiratory PCR

Respiratory samples that can be tested for the virology respiratory PCR include bronchoalveolar lavages (BALs), Endo-tracheal secretions (ETT), NasoPharyngeal Aspirates (NPAs). **Nose and throat swabs (NTS) may be sent but please note swabs have a lower diagnostic yield than respiratory fluid samples and they must be put into special viral transport medium** which is available at the Brompton from the Microbiology Department on **Ext 88449** and at Harefield from the Laboratory Medicine Specimen Reception on **Ext 85365/85196**. Specimens must be received in the virology department at the Brompton by 13:00 on the day of sampling. Please send at least 1ml of respiratory samples.

Legionella pneumophila. A rapid urine antigen test is available on a daily basis for cases that present within 21 days of onset of symptoms – send urine sample in sterile 30ml universal with a clear indication of the request.

Rotavirus, Adenovirus and Norovirus

A rapid test is used to detect rotavirus and adenovirus infection in cases of paediatric gastroenteritis. A rapid test is also available for norovirus detection on specific request. If these tests are negative and a gastroenteritis **outbreak** is being considered faecal samples can be tested at an external laboratory for **Norovirus and other enteric virus PCR**. Please inform a member of the Infection Control team if an outbreak of diarrhoea is suspected.

FUNGAL DIAGNOSTICS including calcofluor white microscopy, extended fungal culture, galactomannan antigen detection, yeast anti-fungal susceptibility testing, *Aspergillus sp* PCR and *Pneumocystis jirovecii* PCR.
Serum beta D Glucan antigen testing..

Calcofluor white is a fluorescent stain that can be used direct on respiratory, tissue and skin, hair and nail samples for the rapid microscopic detection of yeasts and fungi. Calcofluor White is a non-specific fluorochrome that binds to cellulose and chitin in cell walls and it is routinely set up on all bronchoalveolar lavage samples, for other respiratory samples including sputum and for lung tissues specific fungal microscopy requests are required.

Current fungal culture processes including 7 day culture routinely on all BALs and extended 4 week culture if calcofluor white microscopy is positive and preliminary fungal culture is negative. All cystic fibrosis sputum routinely get set up for 4 week fungal culture as do all tissues / biopsies from respiratory sites. For non-CF sputum samples please make a specific request for fungal culture if required, also please indicate when extended 4 week fungal culture is required on specific respiratory samples.

Galactomannan is a component of the cell wall of the mould *Aspergillus* and is released during growth, and a galactomannan antigen test is available by specific clinical request for detection in bronchoalveolar lavage (BAL) and serum samples.

Anti-fungal susceptibility tests are routinely performed on all fungal isolates from blood cultures, vascular line tips, medical device tips and sterile site tissues/biopsies and fluids. Anti-fungal susceptibility tests on mould isolates are performed on first isolation and then annually thereafter and/ or following treatment failure or by specific clinical request.

A PCR assay to detect *Aspergillus sp* in BAL samples is also available as a reference test by specific clinical request, and this assay, together with the galactomannan antigen assay can be used to aid the diagnosis of Invasive Aspergillosis.

Fungal diagnostics are also available and include the **beta-D Glucan serum antigen** detection assay which can help in the diagnosis of Invasive Fungal Disease including candidaemia, invasive Aspergillosis, *Pneumocystis jirovecii* (PCP) pneumonia and other invasive fungal infections. (NB: this test, if negative has a very high negative predictive value).

Pneumocystis testing

A PCR test is available for detecting *Pneumocystis jirovecii* oocysts and trophozoites in samples of bronchoalveolar lavage, induced sputum or endotracheal secretions.

Transplant serology testing

The tests performed for a **pre-transplant screen recipient** will include:
Hepatitis B surface antigen

Hepatitis B core antibody
Hepatitis C serology
HIV serology
HTLV serology
Cytomegalovirus (CMV) IgG
Epstein barr virus (EBV) IgG & EBNA
Measles IgG
Herpes simplex virus (HSV) IgG
VZV IgG
Toxoplasma IgG & IgM
Syphilis total antibody

The tests performed for a **transplant screen donor** will include:

Hepatitis B surface antigen
Hepatitis B core antibody
Hepatitis C serology
HIV serology
HTLV serology
Herpes simplex virus (HSV) IgG
Cytomegalovirus (CMV) IgG
Epstein barr virus (EBV) IgG, IgM & EBNA
Toxoplasma IgG & IgM
Syphilis total antibody
VZV IgG

6. Factors that may affect performance of the sample examination or interpretation of the results, including measurement of uncertainty

Performance of tests and reasons for uncertainty of results can be affected by delays in sending samples to the laboratory, incorrect storage of samples on the wards prior to transportation and/or contamination of specimens during sampling.

Other general sources of result uncertainty include delays in sample transportation or delays in sample processing in the lab, for example receiving haemolysed or lipaemic blood samples for virology/serology assays will interfere with the validity of results. There may also be variations in the assay calibration systems including the measuring equipment and the calibrators / controls used in the assay. Environmental / temperature conditions of the assay performance may also affect performance and personnel test reading bias and other human factors including operator skill / training

level, can also affect test performance. Instrument and commercial assay kit sensitivity and specificity also affect the level of result uncertainty. The laboratory continuously aims to minimise the sources of test result uncertainty by carrying out regular audits, internal quality control, external quality assurance, staff training/ competency assessments and test procedure validation and verification checks.

In addition, for all quantitative measurement and other measurement step assays in microbiology the level of uncertainty i.e. the quantitative indication of the analytical variability of that result has been determined. This measurement of uncertainty provides a quantitative estimate of the level of confidence that the microbiology department has in its analytical precision of quantitative test results.

The microbiology department selects and uses assays and procedures to ensure that any measurement of uncertainty is minimised and these values are regularly reviewed.

Upon specific service user request, the microbiology estimates of measurement uncertainty will be made available.

7. Instructions for Completion of Request and Transportation of Samples including requirements for patient consent

Separate leaflets providing guide for the collection of specimens for microbiological investigations are available on the Intranet:

[Microbiology at the Royal Brompton and Harefield Hospitals | Synnovis](#)

E-REQUESTED SAMPLES (using EPIC)

E-requesting of laboratory tests is available in most wards at the Royal Brompton and Harefield hospital. **All Microbiology, Infection Control Screening and Virology/Serology requests requested through Microbiology specific requesting screens should be placed in blue request bags. At Harefield Hospital the specimen transport bags also have an adsorbent pad inside them to enable the sample to be transported safely to the Brompton site via road.**

For further information on the requirements for the use of the e-requesting system please see the following link:

<http://www2.rbht.nhs.uk/services/labmedicine/phlebspecrec/e-req/>

PAPER REQUESTS

Paper request is only available as a contingency plan during Epic downtime
Please complete the relevant request forms:

| Form | Use of Form |
|--|--|
| Royal Brompton & Harefield Pale Yellow and Red | For MRSA/VRE/CRE investigations ONLY |
| Royal Brompton & Harefield Dark Yellow and Black | For all Microbiology and TB/ AFB requests, swabs, blood cultures, CSF, fluids, bronchial washings, faeces, tissues, sputum, urine, tips etc. |
| Royal Brompton & Harefield White and Orange | For Virology / Serology investigations |

Patient identification and specimen labelling requirements

The Trust places great emphasis on accurate patient identification and correct specimen labelling and request form completion.

The attention of users is therefore drawn to the requirements set out in the Trust policy for accurate patient identification and to the Trust policy for specimen labelling and request form completion <http://www2.rbht.nhs.uk/how-to-guides/trustdocuments/>

- All paper request forms should be legible and ensure full identity is entered on both the top and under copies. The patient's hospital number, consultant, ward/department and full name are essential data on request form and sample. The signature and bleep number of the requesting doctor must also be completed. Unlabelled samples, illegible and incomplete forms may not be accepted. If the sample is irreplaceable and cannot readily be repeated a senior member of the microbiology lab staff will contact the requesting clinician who may want to come and sign a disclaimer form verifying that the sample and request are from the said patient.

The Human Tissue Act including Requirements for Patient Informed Consent

The Human Tissue Act 2004 was given Royal Assent in November 2004 and has been implemented in law since the beginning of April 2006. The cornerstone of the Act is consent, without which it will be illegal to take, use and store human samples for therapeutic use, research and from autopsies. For more information, please see the [Trust Human Tissue Act](http://www2.rbht.nhs.uk/how-to-guides/forms/?p=1&char=C) web pages. Various consent forms are available on the Trust intranet <http://www2.rbht.nhs.uk/how-to-guides/forms/?p=1&char=C>

Please note that requests made for laboratory investigations on research specimens require the use of a special research request form that embodies details of ethical approval and patient consent. Please contact the laboratory if you have difficulty in obtaining supplies of these, or if you have any other questions related to this subject. Also refer to the Trust information on the intranet at the following link

<http://www.rbht.nhs.uk/healthprofessionals/non-clinical-teams/governance/tissuegovernance/research/obtaining-consent/>

Requesting urgent sample analysis

The microbiology laboratory must be contacted prior to dispatch of an urgent sample. For all urgent Microbiology samples please call the RBH site on Ext 88451 from 08:00 until 20:00 on a weekday and from 09:00 until 14:00 on a weekend/bank holiday.

Outside of those hours please contact the on-call Biomedical Scientist for Microbiology via switchboard and they will inform you how the urgent sample can be transported to the microbiology laboratory.

Delivery & transport of specimens to the laboratory

Transport of all specimens needs to be in accordance with the Trust Policy available on the intranet entitled the **Transport of Specimens by Porter, Van, Courier or by Post** <http://www2.rbht.nhs.uk/how-to-guides/trust-documents/>

Manual collection and delivery of specimens to the laboratory

Specimens in the south block Fulham Road and at Harefield are collected by the Trust portering service on an approximately hourly basis and they are delivered to the laboratory specimen reception areas.

Microbiology samples from Harefield patients are transported on a weekday using the cross-site bus, which leaves Harefield daily at 10:00, 12:00 and 16:00, and an additional courier collection occurs from the Laboratory Medicine block at Harefield at 17:30. Courier collections from the Laboratory Medicine Block at Harefield also take place at 11:30 on every Saturday, Sunday and Bank Holiday.

For out of hours or between collections of **urgent sample requests from Harefield please contact the Microbiology Laboratory at RBH on extension 88451 or the Microbiology On-Call Biomedical Scientist.**

Turnaround times (TAT) are from day of receipt to issue of reports in calendar days. The times shown are the typical TATs achieved by the laboratory, but may be longer or shorter depending on the availability of staff and the complexity of the investigation. Microbiology staffs are committed to the fastest possible issue of reports, consistent with accuracy, on the specimens they examine.

8. Microbiology department test repertoire & test turnaround times & applicable reference ranges

| TEST | SAMPLE | AVAILABILITY | TURN AROUND TIME / NOTES | REFERENCE RANGE (IF APPLICABLE) | REFERRED TO REFERENCE LAB |
|--|--|--|--|---------------------------------|---------------------------|
| AFB Microscopy, Culture Sensitivities & Identification | Various sample types in universal containers | Every weekday | AFB smear: same day if urgent, up to 3-4 days routine Culture 2-9 weeks | | |
| Adenovirus PCR (Respiratory infection) | BAL, NPA, ETT | Weekdays Weekends (from Oct-April only) | Same day-2 days | | |
| Adenovirus PCR (Systemic infection) | EDTA blood | Every weekday | 3-5 days | | Yes |

| | | | | | |
|---|--------|---------------|----------------|--|-----|
| Adenovirus PCR (enteric infection for diarrhoea outbreak investigation) Please contact the Infection Control Team prior to sending. | Faeces | Every weekday | Same day-2days | | Yes |
|---|--------|---------------|----------------|--|-----|

| TEST | SAMPLE | AVAILABILITY | TURN AROUND TIME / NOTES | REFERENCE RANGE (IF APPLICABLE) | REFERRED TO REFERENCE LAB |
|---|---------------|---------------|-----------------------------|------------------------------------|---------------------------------|
| Amoebic Antibodies Relevant clinical details required | Clotted blood | Referred test | Up to 3 weeks | | Yes |

| | | | | | |
|---|------------------------------------|-------|--|---|--|
| Antibiotic level assays for Amikacin, Gentamicin, Tobramycin, Vancomycin and Antiviral assays for Ganciclovir | Clotted blood | Daily | See Biochemistry User Guide Also refer to Antimicrobial prescribing guide Page 206 | Refer to Biochemistry User Guide http://www2.rbht.nhs.uk/search/?q=biochemistry Also refer to Antimicrobial prescribing guide pag206 https://www.3e.co.uk/app/9/Download.aspx?r=fa231437-8d3d-45ce-98b3-6fd81dff2749 | |
| Antibiotic susceptibility testing | All significant bacterial isolates | Daily | 1-2 days | | |

| TEST | SAMPLE | AVAILABILITY | TURN AROUND TIME / NOTES | REFERENCE RANGE (IF APPLICABLE) | REFERRED TO REFERENCE LAB |
|------|--------|--------------|--------------------------|---------------------------------|---------------------------|
|------|--------|--------------|--------------------------|---------------------------------|---------------------------|

| | | | | | |
|--|-----------------|--|--|--|--------------------------------|
| Anti-fungal level assays for voriconazole, posaconazole, itraconazole | Clotted blood | Assays run in Heart Science Centre at Harefield on a Tues and a Fri before 11:00am | Refer to IMS Laboratory at the Heart Science Centre Harefield 01895 828570 | Refer to the Antimicrobial prescribing guide page 99 https://www.3e.co.uk/app/9/Download.aspx?r=fa231437-8d3d-45ce-98b3-6fd81dff2749 | |
| Anti-fungal susceptibility tests on yeasts (sterile site samples routine others on specific request) | Fungal isolates | Daily | 2 days | | |
| Anti-fungal susceptibility tests on moulds (sterile site samples routine, others on first mould isolate and annually thereafter and on isolates with treatment failure following specific request) | Fungal isolates | Every weekday | Up to 2 weeks | | Yes some requests are referred |

| TEST | SAMPLE | AVAILABILITY | TURN AROUND TIME / NOTES | REFERENCE RANGE (IF APPLICABLE) | REFERRED TO REFERENCE LAB |
|--|----------------------------------|---------------|--------------------------------|---------------------------------|---------------------------|
| Antiviral drug resistance testing | EDTA blood | Referred test | 3-5 days | | Yes |
| <i>Aspergillus</i> sp PCR | BAL | Referred test | 4-7 days | | |
| <i>Beta</i> -D Glucan antigen | Clotted blood | Twice weekly | 3 days | | |
| Bartonella PCR Relevant clinical details required | Biopsy/ Tissue/ EDTA blood | Referred test | 2-3 weeks | | Yes |
| Blastomyces fungal serology Relevant clinical details required | Clotted blood | Referred test | Up to 2 weeks | | Yes |
| Broncho-alveolar lavage (BAL) routine culture | BAL | Daily | 2-9 days (for fungal culture) | | |

| TEST | SAMPLE | AVAILABILITY | TURN AROUND TIME / NOTES | REFERENCE RANGE (IF APPLICABLE) | REFERRED TO REFERENCE LAB |
|---|-----------------------|---------------|--|---------------------------------|---------------------------|
| Blood Culture | Blood culture bottles | Daily | Positive – notified immediately. Final negative result – 7- 21 days | | |
| Bordetella pertussis culture Please contact the Infection Control Team prior to sending. | Pernasal swab | Daily | 3-7days | | |
| Bordetella pertussis serology Please contact the Infection Control Team prior to sending. | Clotted blood | Referred test | 1-3 weeks Please include relevant clinical details when requesting | | Yes |
| Borrelia antibodies (Lyme disease) Relevant clinical details required | Clotted blood | As requested | 1-2 weeks | | Yes |

| TEST | SAMPLE | AVAILABILITY | TURN AROUND TIME / NOTES | REFERENCE RANGE (IF APPLICABLE) | REFERRED TO REFERENCE LAB |
|---|---------------|---------------|--------------------------|---------------------------------|---------------------------|
| <i>Candida auris</i> screening | Swab | Daily | 2-4 days | | |
| Chikungunya virus serology Relevant clinical details required | Clotted blood | Every weekday | 1-2 weeks | | Yes |
| <i>Clostridium difficile</i> Toxin & GDH antigen test | Faeces | Daily | Same day – 1 day | | |
| CMV PCR | EDTA blood | Daily | 1-2 days | | |

| TEST | SAMPLE | AVAILABILITY | TURN AROUND TIME / NOTES | REFERENCE RANGE (IF APPLICABLE) | REFERRED TO REFERENCE LAB |
|--|---------------|---------------|--------------------------|---------------------------------|---------------------------|
| Coccidioides serology Relevant clinical details required | Clotted blood | Referred test | 3 weeks | | Yes |

| | | | | | |
|---|--|---------------|-----------|---|-----|
| Cough swab (for details of the procedure for the collection of cough swabs please liaise with Paediatric Physiotherapists) | Cough swab (Sample taken by Paediatric Physiotherapists) | Every weekday | 4-5 days | | |
| Coxiella burnetii PCR Relevant clinical details required | EDTA blood | Referred test | 1-2 weeks | | Yes |
| Carbapenemase Resistant Enterobacteriaceae (CRE) screen | Rectal swab or stool sample Note: Rectal swab must have visible faeces present) | Daily | 2-4 days | See Infection Control Policy CRE Management & Screening Policy Infection Control policies, guidance and protocols - Intranet (rbht.nhs.uk) | |

| TEST | SAMPLE | AVAILABILITY | TURN AROUND TIME / NOTES | REFERENCE RANGE (IF APPLICABLE) | REFERRED TO REFERENCE LAB |
|------|--------|--------------|--------------------------|---------------------------------|---------------------------|
|------|--------|--------------|--------------------------|---------------------------------|---------------------------|

| | | | | | |
|--|--|---------------|--|--|-----|
| Cryptococcal antigen | Clotted blood or CSF (0.5-1.0ml) | Referred test | 5-7 days | | Yes |
| CSF | CSF (1.05ml) (Viral PCR 200µl) (AFB investigation 10ml+, where possible) | Daily | Microscopy: same day Culture= 2-7 days | | |
| Cystic sputum culture | Sputum | Every weekday | 3-7 days routine culture 4-5 weeks for fungal culture | | |
| Dengue fever serology Relevant clinical details required | Clotted blood | Referred test | Up to 2 weeks | | Yes |

| TEST | SAMPLE | AVAILABILITY | TURN AROUND TIME / NOTES | REFERENCE RANGE (IF APPLICABLE) | REFERRED TO REFERENCE LAB |
|---|-----------------------|--|--------------------------|---------------------------------|---------------------------|
| EBV PCR | EDTA blood | Referred test | 3-5 days | | Yes |
| TSpot TB test | Lithium heparin blood | Referred test Fresh sample needs to be in lab by 16:00 at Harefield and 17:00 at the Brompton Monday-Friday only. Please call lab on Ext:88449 to inform of request | 3-5 days | | Yes |
| Enterovirus PCR (systemic infection) | EDTA blood | Referred test | 3-5 days | | Yes |
| Enterovirus PCR (Respiratory infection) | BAL, NPA, ETT | Weekdays Weekends (from Oct-April only) | Same day-2 days | | |
| Eye / Ear swabs | Swab | Daily | 2-9 days (fungi) | | |

| TEST | SAMPLE | AVAILABILITY | TURN AROUND TIME / NOTES | REFERENCE RANGE (IF APPLICABLE) | REFERRED TO REFERENCE LAB |
|--|---------------|---------------|---|---------------------------------|---------------------------|
| Faeces – routine culture | Faeces | Daily | 2-4days | | |
| Faeces-diarrhoeal outbreak investigation for all viruses including Norovirus, Adenovirus, Rotavirus, Astrovirus, Calicivirus and Sapovirus Please contact the Infection Control Team prior to sending. | Faeces | Every weekday | Same day-2days | | Yes |
| Filaria Antibodies Relevant clinical details required | Clotted blood | Referred test | 2-3 weeks | | Yes |
| Fluid / Aspirate / Pus | Various | Daily | Microscopy: same day Culture = 2-7 days | | |

| | | | | | |
|---------------------------------------|-------------------------|-------|---|--|--|
| Fungal Culture for tissues / biopsies | Tissue / biopsy / fluid | Daily | 4-5 weeks for routine fungi 6-8 weeks for dimorphic fungi | | |
|---------------------------------------|-------------------------|-------|---|--|--|

| TEST | SAMPLE | AVAILABILITY | TURN AROUND TIME / NOTES | REFERENCE RANGE (IF APPLICABLE) | REFERRED TO REFERENCE LAB |
|--|----------------------|---------------|-------------------------------|---------------------------------|---------------------------|
| Fungal microscopy (calcofluor white microscopy) Routinely performed on all BAL samples, for other samples please make specific request | BAL, Sputum, Tissues | Every weekday | Microscopy: same day – 3 days | | |

| | | | | | |
|-----------------------|--|---|--------------|--|--|
| Galactomannan antigen | BAL / clotted blood / sputum | Tested twice a week on a Tuesday and a Friday | Up to 4 days | BAL / sera fluid with an index of <0.5 = Negative BAL fluid 0.5-1.0= Positive with low predictive value BAL fluid >1.0 = Positive Sputum results are not commercial kit validated for this assay but >0.5 = Positive with a caution comment. | |
| Genital swabs | Cervical, urethral, vaginal, penile swabs | Every weekday | 2-4days | | |

| TEST | SAMPLE | AVAILABILITY | TURN AROUND TIME / NOTES | REFERENCE RANGE (IF APPLICABLE) | REFERRED TO REFERENCE LAB |
|--|---------------|---------------|-----------------------------|------------------------------------|---------------------------------|
| Hantavirus serology Relevant clinical details required | Clotted blood | Referred test | Up to 2 weeks | | Yes |

| | | | | | |
|--------------------------------------|--------|---------------|--------|--|-----|
| Helicobacter pylori antigen (faeces) | Faeces | Referred test | 7 days | | Yes |
|--------------------------------------|--------|---------------|--------|--|-----|

| TEST | SAMPLE | AVAILABILITY | TURN AROUND TIME / NOTES | REFERENCE RANGE (IF APPLICABLE) | REFERRED TO REFERENCE LAB |
|---|---------------|---------------|--------------------------|---------------------------------|---------------------------|
| Hepatitis C PCR | EDTA blood | Referred test | 3-5 days | | Yes |
| Hepatitis E Antibodies Relevant clinical details required | Clotted blood | As requested | Up to 12 days | | Yes |
| Hepatitis E PCR Relevant clinical details required | EDTA blood | Referred test | Up to 18 days | | Yes |

| TEST | SAMPLE | AVAILABILITY | TURN AROUND TIME / NOTES | REFERENCE RANGE (IF APPLICABLE) | REFERRED TO REFERENCE LAB |
|------|--------|--------------|--------------------------|---------------------------------|---------------------------|
|------|--------|--------------|--------------------------|---------------------------------|---------------------------|

| | | | | | |
|---|------------------------------------|---------------|-----------------|--|-----|
| Herpes simplex PCR, VZV PCR | Vesicle fluid / virology skin swab | Referred test | 3-5 days | | Yes |
| Histoplasma serology Relevant clinical details required | Clotted blood | Referred test | Up to 3 weeks | | Yes |
| Homograft tissue / fluid sterility Tests (not mycobacteria) | Homograft tissues/fluid | Every weekday | Up to 3 weeks | | |
| Human Herpes Virus HHV-6 PCR | EDTA blood | Referred test | 3-5 days | | Yes |
| Hydatid Antibodies Relevant clinical details required | Clotted blood | Referred test | 2-3 weeks | | Yes |
| Legionella antigen (in urine) | Urine | Daily | Same day- 1 day | | |

| TEST | SAMPLE | AVAILABILITY | TURN AROUND TIME / NOTES | REFERENCE RANGE (IF APPLICABLE) | REFERRED TO REFERENCE LAB |
|------|--------|--------------|--------------------------|---------------------------------|---------------------------|
|------|--------|--------------|--------------------------|---------------------------------|---------------------------|

| | | | | | |
|--|---------------|---------------|---------------|--|-----|
| Leishmania Antibodies Relevant clinical details required | Clotted blood | Referred test | 2-3 weeks | | Yes |
| Leptospira serology Relevant clinical details required | Clotted blood | Referred test | Up to 10 days | | Yes |
| Malaria antibodies (past infection) Relevant clinical details required For diagnosis of acute infection refer to the Haematology Dept User Guide | Clotted blood | Referred test | Up to 3 weeks | | Yes |
| Measles IgG | Clotted blood | As requested | 7-9 days | | |

| TEST | SAMPLE | AVAILABILITY | TURN AROUND TIME / NOTES | REFERENCE RANGE (IF APPLICABLE) | REFERRED TO REFERENCE LAB |
|------|--------|--------------|--------------------------|---------------------------------|---------------------------|
|------|--------|--------------|--------------------------|---------------------------------|---------------------------|

| | | | | | |
|---|---|---|---|--|-----|
| Measles IgM Relevant clinical details required. Please contact the Infection Control Team prior to sending. | Clotted blood | Referred test | 2 weeks | | Yes |
| MRSA Screen | Nose / Throat /Axilla /Groin / other sites | Daily | Up to 3 day if negative 2-5 days if positive | | |
| Mumps serology Relevant clinical details required | Clotted blood | As requested | 2 weeks | | Yes |
| <i>Mycoplasma pneumoniae</i> respiratory PCR | BAL, NPA, ETT | Weekdays Weekends (from Oct-April only) | Same day-2 days | | |
| <i>Mycoplasma pneumoniae</i> blood sample PCR | EDTA blood | Referred test | 3-5 days | | Yes |

| | | | | | |
|-------------------|--------|---------------|------------------|--|--|
| Norovirus antigen | Faeces | Every weekday | Same day – 1 day | | |
|-------------------|--------|---------------|------------------|--|--|

| TEST | SAMPLE | AVAILABILITY | TURN AROUND TIME / NOTES | REFERENCE RANGE (IF APPLICABLE) | REFERRED TO REFERENCE LAB |
|---|---|---------------|--------------------------|---------------------------------|---------------------------|
| Ova, Cysts, Parasites Relevant clinical details required. Please also mention if there is contact with non-potable water. | Faeces (minimum of two samples on different days) | Every weekday | 1-4 days | | |

| TEST | SAMPLE | AVAILABILITY | TURNAROUND TIME /NOTES | REFERENCE RANGE (IF APPLICABLE) | REFERRED TO REFERENCE LAB |
|--|----------------|-----------------------------------|------------------------|---------------------------------|---------------------------|
| Parechovirus PCR | EDTA blood | Referred test | 3-5 days | | Yes |
| Parvovirus serology Relevant clinical details required | Clotted blood | As requested | 28 days | | Yes |
| Parvovirus B19 PCR | EDTA blood | Referred test | 3-5 days | | Yes |
| Pneumococcal antigen | Urine | Daily | Same day – 1 day | | |
| Pneumocystis PCR | BAL/ Sputum | Tested once a week on a Wednesday | 7-8days | | |
| Pseudomonas IgG antibodies (for specific CF requests) | Clotted blood | Referred test | Up to 2 weeks | | Yes |

| TEST | SAMPLE | AVAILABILITY | TURNAROUND TIME /NOTES | REFERENCE RANGE (IF APPLICABLE) | REFERRED TO REFERENCE LAB |
|--|--|---|------------------------|---|---------------------------|
| Respiratory PCR including Influenza A (including H1N1), Influenza B, Parainfluenza 1, 2 3 and 4, Human Metapneumovirus A & B, Respiratory Syncytial Virus A & B, Adenovirus, Enterovirus, Bocavirus, Parechovirus, Rhinovirus and <i>Mycoplasma pneumoniae</i> . SARS-CoV-2 | BAL, NPAs, ETT, SPT (>1ml) & NTS in viral transport medium | Weekdays Weekends (from Oct-April only) Daily | Same day-2 days | | |
| Respiratory PCR for Coronavirus MERS-CoV Coronavirus SARS-CoV-2 (Severe acute respiratory syndrome) a rapid sequencing and genotyping/reflex service | Respiratory samples | Daily | Same day up to 4 days | Refer to UKHSA Manchester Manchester.Sequencing@phe.gov.uk | Yes |

| TEST | SAMPLE | AVAILABILITY | TURNAROUND TIME /NOTES | REFERENCE RANGE (IF APPLICABLE) | REFERRED TO REFERENCE LAB |
|--|-------------------------|---------------|---|---------------------------------|---------------------------|
| Rotavirus and Adenovirus Antigen | Faeces | Daily | Same day – 1 day | | |
| Schistosomal serology Relevant clinical details required | Clotted blood | Referred test | 2-3 weeks | | Yes |
| Schistosoma in urine | Terminal urine sample | Every weekday | 1-3 days | | |
| Sputum / ETT culture | Sputum / ETT secretions | Daily | 2-4 days (routine culture) 7-10 days (fungal culture) | | |

| TEST | SAMPLE | AVAILABILITY | TURNAROUND TIME /NOTES | REFERENCE RANGE (IF APPLICABLE) | REFERRED TO REFERENCE LAB |
|------|--------|--------------|------------------------|---------------------------------|---------------------------|
|------|--------|--------------|------------------------|---------------------------------|---------------------------|

| | | | | | |
|---|----------------------------|---------------|---|--|-----|
| Skin, hair, nail for fungi | Skin, hair, nail clippings | Every weekday | Microscopy; same day Culture: 14-21days | | |
| Strongyloides serology Relevant clinical details required | Clotted blood | Referred test | 2-3 weeks | | |
| Ear, Nose & Throat swab (ENT) | ENT swabs | Daily | 2-4 days | | |
| Tips (lines) | Line tips | Daily | 2-4days | | |
| Tissue, biopsies | Tissue / biopsy | Daily | Microscopy: same day Culture:2-4 days | | |
| Toxocara Antibodies Relevant clinical details required | Clotted blood | Referred test | 2-4 weeks | | Yes |

| TEST | SAMPLE | AVAILABILITY | TURNAROUND TIME /NOTES | REFERENCE RANGE (IF APPLICABLE) | REFERRED TO REFERENCE LAB |
|------|--------|--------------|------------------------|---------------------------------|---------------------------|
|------|--------|--------------|------------------------|---------------------------------|---------------------------|

| | | | | | |
|--|---------------|---------------|--|--|-----|
| Trypanosome serology Relevant clinical details required | Clotted blood | Referred test | 2-4 weeks | | Yes |
| Urine Microscopy & culture | Urine | Daily | Microscopy: same day. Culture: 1-2 days | | |
| Varicella IgM Antibodies Relevant clinical details required. Please contact the Infection Control Team prior to sending. | Clotted blood | Referred test | 2 weeks | | Yes |

| TEST | SAMPLE | AVAILABILITY | TURNAROUND TIME /NOTES | REFERENCE RANGE (IF APPLICABLE) | REFERRED TO REFERENCE LAB |
|--|----------------------------|--|------------------------|---------------------------------|---------------------------|
| Viral haemorrhagic Fever (VHF) including Ebola virus PCR/serology. | EDTA blood & clotted blood | Daily Please contact the Consultant Microbiologist prior to sending this request | 2-3 days | | Yes |

| | | | | | |
|---------------|----------------------------|-------|--|--|--|
| VRE screening | Rectal swab / stool sample | Daily | 2-3 days N.B VRE screening is ONLY carried out on positive patients. | | |
| Wound swabs | Various sites | Daily | 2-4 days | | |

9. Addresses of Referral Laboratories and list of tests referred

| | | Accreditation Reg.No. | Tests Referred |
|----|--|--------------------------|---|
| 1. | Department of Infection & Immunity 9 th Floor Laboratory Block Charing Cross Hospital Fulham Palace Road London W6 8RF Tel: 0203 3135353 | 0477 | HIV confirmation tests. Helicobacter pylori Antigen |
| 2. | Hospital for Tropical Diseases Hospital for Tropical Diseases Capper St off Tottenham Court Rd London WC1E 6AU Tel: 020 7387 4411 x5413 | 2354 | Amoebic antibodies Filaria antibody Hydatid antibodies Leishmania antibody Schistosomal antibodies Strongyloides antibody Trypanosome antibody Entamoeba serology Toxocara serology Malaria serology |
| 3. | Virus Reference Department (VRD) UKHSA 61 Colindale Avenue London NW9 5HT Tel: 020 8327 6017 | 1834 | Parvovirus serology & PCR Measles IgM antibody Rubella IgM antibody Varicella IgM antibodies |
| 4. | Rare & Imported Pathogens Laboratory, UKHSA Porton Salisbury Wilts SP4 0JG Tel: 01980 612 100 | 1612 | Hantavirus Rickettsia serology Ross River Valley fever Dengue virus VHF (including Ebola) serology Chikungunya virus serology <i>Coxiella burnetii</i> PCR Leptospira antibodies & PCR |

| | | | |
|----|--|------|---|
| 5. | Respiratory & Systemic infection Laboratory UKHSA Centre for Infections 61 Colindale Avenue London NW9 5EQ Tel: 020 8200 4400 | 0590 | Bartonella PCR Bordetella serology & PCR Legionella PCR |
|----|--|------|---|

| | | Accreditation Reg.No. | Tests Referred |
|----|---|----------------------------------|--|
| 6. | Liverpool Clinical Laboratories Virology Reception, Ground Floor Royal Liverpool and Broadgreen University Hospitals NHS Trust Duncan Building Prescot Street Liverpool L7 8XP Tel: 0151 706 4404 | 0453 | Brucella Serology |
| 7. | Virus Reference Department Microbiology Services Colindale 61 Colindale Avenue London NW9 5HT Tel: 020 8327 6017 | 2904 | HTLV 1+2 confirmation Hepatitis Delta Hepatitis E serology & PCR |
| 8. | Toxoplasma Reference Laboratory (TRL) Swansea Singleton Hospital Swansea SA2 8QA Tel: 01792 285 055 | 1651 | Toxoplasma antibody IgG and IgM –confirmation Toxoplasma PCR |

| | | | |
|----|--|------|-----------------------|
| 9. | Rare & Imported Pathogens Laboratory, UKHSA Porton Salisbury Wilts SP4 0JG Tel: 01980 612 100 | 1180 | Leptospira antibodies |
|----|--|------|-----------------------|

| | | Accreditation Reg.No. | Tests Referred |
|-----|--|--------------------------|---|
| 10. | Micropathology (Warwick) University of Warwick Science Park Barclays Venture Centre Sir William Lyons Road Coventry CV4 7EZ Tel: 02476 323222 | 1926 | Adenovirus PCR (blood) Antiviral drug resistance testing Aspergillus genus DNA <i>Chlamydia pneumoniae</i> PCR <i>Chlamydia psittaci</i> PCR CMV PCR EBV PCR Enterovirus RNA HBV DNA HCV RNA HIV-1 proviral DNA/RNA HIV-1 RNA quantification HIV-2 HSV DNA Parvovirus B19 DNA PCR Treponema pallidum PCR VZV DNA HHV6 PCR HHV8 PCR <i>Mycoplasma pneumoniae</i> PCR (blood) Parechovirus PCR(blood) |
| 11. | UK Health Security Agency - Mycology Reference Laboratory, Myrtle Road Kingsdown Bristol BS2 8EL Tel: 0117 342 5028 | 0042 | Coccidioides serology Histoplasma serology Blastomyces serology <i>Candida auris</i> typing Cryptococcal antigen testing Fungal identification & sensitivity testing namely for isolates not tested in-house. |

| | | | |
|-----|--|------|---|
| 12. | Antimicrobial Resistance and Healthcare Associated Infections (AMRHA) UK Health Security Agency 61 Colindale Avenue London NW9 5EQ Tel: 020 8200 4400 | 1834 | Gram negative ID & sensitivity testing & typing e.g. Acinetobacter & Burkholderia VNTR typing Pseudomonas VNTR typing Gram negative typing Staphylococcal typing (whole genome sequencing) Streptococcal typing MRSA typing <i>Mycobacterium abscessus</i> VNTR typing PVL detection CRE typing VRE typing |
|-----|--|------|---|

| | | Accreditation Reg.No. | Tests Referred |
|-----|---|-----------------------|--|
| 13. | National Mycobacterium Reference Services-South UKHSA National Infection Service 61 Colindale Avenue London NW9 5HT Tel: 0208 327 6957 | 2140 | Mycobacteria identification & sensitivity testing (namely for isolates not identified in-house) & typing (whole genome sequencing) Fast track PCR for MTB & Rifampicin resistance detection |
| 14. | Department of Microbiology Level 4 Camelia Botnar Laboratories Great Ormond Street Hospital for Sick Children NHS Trust London WC1N 3JH Tel: 020 78298661 | 1589 | 16S rDNA PCR (bacteria) 18S rDNA PCR (Fungi) |

| | | | |
|-----|---|-------|--|
| 15. | Anaerobe Reference Laboratory Public Health Wales Microbiology Cardiff University Hospital of Wales Heath Park Cardiff CF14 4XW Tel: 02920 742 171 | 2913c | Anaerobe identification & resistance testing of anaerobes |
| 16. | Meningococcal Reference Unit Manchester Medical Microbiology Partnership PO Box 209 Clinical Science Building Manchester Royal Infirmary Manchester M13 9WZ Tel: 0161 276 5698 | 0635 | Meningococcal PCR |
| 17. | Antibiotic Resistance Mechanisms Service (ARMS) UKHSA Microbiology Services 61 Colindale Avenue London NW9 5EQ Tel: 020 8327 6511 | 1834 | ARMRL is the national reference laboratory responsible for the detection and investigation of antibiotic resistance including ESBLs, VREs, Pen-R pneumos, Carbapenemase detection. |

| | | Accreditation Reg.No. | Tests Referred |
|-----|---|------------------------------|--|
| 18. | Haemophilus Reference Unit UKHSA Respiratory and Vaccine Preventable Bacteria Reference Unit 61 Colindale Avenue London NW9 5HT Tel: 020 8200 4400 | 0590 | Haemophilus identification / typing (for invasive isolates) & serology |

| | | | |
|-----|---|--------------|--|
| | | | |
| 19. | <p>Gastrointestinal Bacteria Reference Unit (GBRU) UKHSA Microbiological Services 61 Colindale Avenue London NW9 5EQ</p> <p>Tel. 020 8327 7116</p> | 1683 | <p>E.coli 0157 and non-0157 identification & typing Verocytotoxin PCR</p> <p>Shigella, Salmonella, Yersina, Vibrio identification / typing</p> |
| 20. | <p>Respiratory and Vaccine Preventable Bacteria Reference Unit UKHSA 61 Colindale Avenue London NW9 5HT</p> <p>Tel: 020 8200 4400</p> <p>Tel: 020 8200 4400</p> | 0590 | <p>Streptococcal typing e.g. Group A Streptococci & identification of C. diphtheriae isolates</p> |
| 21. | <p>Sexually Transmitted Infections Reference Laboratory (STIRL) UKHSA Centre for Infections 61 Colindale Avenue London NW9 5HT</p> <p>Tel: 020 8327 6464</p> | 2887 | <p>Syphilis serology confirmation including: total antibody EIA IGM EIA RPR Inno LIA</p> |
| 22. | <p>Oxford Diagnostic Laboratories Oxford Immunotec Ltd 94C Innovation Drive Milton Park Abingdon Oxfordshire OX14 4RZ</p> <p>Tel: 01235 433164</p> | UKAS 4066 | TB Elispot testing |

| | | Accreditation Reg.No. | Tests Referred |
|-----|---|----------------------------------|---|
| 23. | National Transfusion Microbiology Reference Laboratory (NTMRL) NHSBT Colindale Charcot Road London NW9 5BG Tel: 0208 957 2700 | 2188 | Heart valve bank sera testing for HIV PCR, HCV PCR and HBV PCR West Nile Virus serology for heart valve bank samples. |
| 24. | Barts & the London NHS Trust Department of Medical Microbiology & Virology 3rd Floor Pathology and Pharmacy Building 80 Newark Street London E1 2ES | 0767 | <i>Clostridium difficile</i> typing / culture |
| 25. | Seven Pathology, Infection Sciences Southmead Hospital, Bristol, BS10 5NB Tel: 01174146222 | 459 | <i>Beta D Glucan</i> antigen testing |
| 26. | Virology Department Royal Free Hospital London NW3 2QG Tel: 020 7830 2627/8 | 1062 | Multiplex PCR for enteric viruses |
| 27. | Clinical Immunology Department Leeds General Infirmary Old Medical School Leeds Thoresby Place LS1 3EX | 1120 | <i>Pseudomonas</i> IgG |

| | | | |
|-----|--|------------------------------|---|
| 28. | Birmingham Public Health Laboratory, Virology Dept Heart of England NHS Foundation Trust Bordesley Green East Birmingham B9 5SS Telephone 0121 424 2500 *out of hours 0121 424 2000 | 8213 | Middle East Respiratory Syndrome Coronavirus (MERS-CoV) testing (N.B All contact for testing for MERS-CoV remains with the PHL London team using the 0300 303 2429 telephone number, including for clinical queries and issue of results). |
| | | Accreditation Reg.No. | Tests Referred |
| 29. | Clinical Microbiology & Public Health Laboratory (CMPHL) Level 6, Box 236, Addenbrooke's Hospital, Cambridge, CB2 0QW | 1071 | Avian Influenza (N.B All contact for testing for Avian Influenza remains with the PHL London team using the 0300 303 2429 telephone number, including for clinical queries and issue of results). |

10. The Laboratory's policy on protection of personal information

Security of clinical material and associated process and quality records including patient and staff personal information is maintained at all times and access is controlled. The department of Microbiology is a secure laboratory area and access is secured by an access control swipe card and pin system with the provision of three high security doors.

Security of electronic records is maintained by the use of different levels of personalised password protected access to the I.T systems. Staff also complete annual mandatory update training sessions that cover Information Governance including the security of patient data and the Data Protection Act / Caldicott Principles. All information on patients within the laboratory is governed by the Data Protection Act, 1998 and the Caldicott Principles as well as Trust's Confidentiality & Data Protection Policy at <http://www2.rbht.nhs.uk/how-to-guides/trust-documents/>

Access to the Laboratory Information Management System (LIMS) servers is controlled through swipe card plus physical key in an alarmed server room. Backup tape copies are held in a separate building in a locked fireproof safe.

Online access to computer archives is restricted to suitably authorised staff and controlled by the use of personal codes and passwords, which allow only certain functions to be used. EPIC is the approved way, for ward and clinical staff to access patient records, and users are allocated unique login codes with a defined password expiry period.

All emailing of information containing patient records is done in accordance with Trust practices on a case by case basis and ensuring that the secure network location is confirmed as a safe haven location. All information sent outside the facility is rendered free of patient identifying details unless sent to a known safe haven location. All laptops are encrypted so as to render them unusable should they fall into the wrong hands. Confidential information on staff is held in lockable filing cabinets which are secured when left unattended for an operational period of time.

11. The Laboratory's complaint procedure

Official complaints from users of the service may be received by the Synnovis Customer services or directly by the laboratory.

All complaints will be formally logged and a full investigation carried out that identifies remedial and corrective actions and a root cause analysis carried out to ensure future preventive action. The investigator will make early contact with the complainant and establish their expectations focusing on early, swift local resolution. The investigator

will also provide outcome feedback to the complainant and confirm that the issues have been resolved.

Where user comments and/or complaints have been identified that have or could have affected patient management they will also be reported through the RADAR online incident reporting system. All incidents logged on this system are reviewed regularly by senior management and reports regarding number of incidents, category and severity are completed and discussed at Trust Committees: Risk, Health and Safety and Governance and Quality.