Public Health England

NHS Severn Pathology
North Bristol NHS Trust

Severn Pathology

Bristol Infection Sciences Laboratory

User Manual

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Amendment History

Any copy printed in the wards or GP surgery or other location outside the laboratories control becomes an uncontrolled document and is not managed under the Infection Sciences Document Control procedure. It is the responsibility of the copyholder to ensure that any hard copy in their possession reflects the current version available on the intranet / internet sites. Notification will be sent to all copyholders when an updated version of this manual becomes available

Date	Old edition no	New edition no	Section/page No	Amendments
May 2017		1.0	All	First Issue
May 2017	1.0	1.1	All	Contact details updated – appendix 1
September 2017	1.1	2.0	All	TAT revised Minor typo errors addressed Specimen types updated (Charcoal to Liquid swabs)
June 2018	2.0	2.1	 Page 8 Page 13 Page 17 Page 39	Updated to include; Influence of transport on sample integrity & collection of samples by patient Changes to blood cultures services Information on availability of Uncertainty of measurement Amendments to personnel
October 2018	2.1	2.2	Page 6 Page 8 Appendix 1	Accreditation link added Updated information for patients included Contact details for MRL updated
March 2019	2.2	2.3	Introduction – page 4 Repertoire – page 20 Appendix 1 Appendix 2 Appendix 3	General review – some information amended for clarity Updated with respect to new tests available Contact details updated Details for new tests added Referral locations updated
July 2019	2.3	2.4	Page 4 Appendix 3	Map link updated Referral locations updated
Jan 2020	2.4	3.0	Page 4 Page 7 Page 9 Page 13 Appendix 1 Appendix 2 Whole document	Site map link updated Virology on call arrangements updated Clarification on “expired” sample containers added Additional guidance included relating to high risk samples Contact details reviewed and updated Details for new tests added & amendments to scope updated for changes in procedures General review carried out by senior management team
Jan 2021	3.0	3.1	Page 14 Page 20 Page 22 Page 28 Appendix 1	Clarification on transport of temperature sensitive sample types added Addition of SARS Molecular test to repertoire Comment regarding preferred sample types for Bacteriology Screening service details up dated (MSSA, CPE, MRC) Individual’s details updated following staffing changes with interim positions

Contents

USEFUL TELEPHONE NUMBERS

For full listing see page 37

Southmead Hospital switchboard: Telephone 0117 950 5050

Maps are available:
https://www.nbt.nhs.uk/our-hospitals/southmead-hospital

General Infection Sciences Enquiries **0117 4146222**

This is our main automated switchboard number. Use this and then select the appropriate option.

Finalised results should be accessed in ICE or Open ICE - please use these whenever possible. Incomplete result profiles or results which still require clinical review cannot be given.

For public health advice and advice on mmeningitis and other infectious disease notification please call 0300 3038162

Stores/Supplies
If you wish to order laboratory consumables (specimen containers, forms swabs etc) please call

BRI site	**0117 342 2573**
RUH Site	**01225 82 4724**
NBT Site	**0117 414 8406**

INTRODUCTION

The Infection Sciences Bristol Laboratory is located at the North Bristol NHS trust (NBT) hospital site and the laboratory is one of the largest Infection Sciences laboratories in the UK, providing a clinical service for the North Bristol NHS Trust, University Hospitals Bristol NHS Foundation Trust (UHBristol), the Royal United Hospital Bath NHS Trust (RUHT) and for the many GP practices in the Bristol and Bath areas.

The Infections Sciences laboratory has been formed from collaboration between the Pathology services of the North Bristol NHS Trust (NBT) and Public Health England (PHE). As part of this collaboration, NBT and PHE have agreed to provide some of these services in an integrated way. The Collaboration Agreement governs the relationship of the Parties with respect to the Pathology services and the laboratory associated public health services to be provided from NBT's facilities at Southmead Hospital, Bristol, and set out how staff and resources will be pooled and configured in respect of integrated services.

The Department of Infection Sciences provides a hospital-based service for the diagnosis and clinical management of infectious diseases for patients in both hospital and the community, together with advice on the control of infection.

The laboratory is located over three different sites with the main laboratory situated at the NBT site and houses the following:

Virology department - providing a comprehensive diagnostic and clinical Virology service to NBT, UHBW and the RUHT. The laboratory also supplies a referral service for many other pathology depts located within hospitals across the South West. The laboratory provides both regional and national specialist tests and has an international reputation for excellence.

Clinical Bacteriology Department - The department accepts many hundreds of specimens daily for bacteriological investigation, and is able to offer clinical advice on all aspects of clinical Bacteriology and Parasitology, including advice on antibiotic treatment, control of infection, and emerging antibiotic-resistant organisms.

Satellite laboratories

UHBristol Pathology

A satellite clinical Bacteriology service is situated adjacent to other disciplines within the UHBristol Laboratory Medicine Department. This provides on-site clinical support and infection control advice to the UHBristol NHS Trust as well as some limited diagnostic tests delivered by UHBristol pathology reception staff with oversight from the Infection Sciences laboratory. These currently include targeted rapid testing for Flu/RSV as well as the receipt and incubation of blood culture samples from the UHBristol NHS trust to facilitate time sensitive loading requirements for these samples.

Royal United Hospital Pathology

The Royal United Hospital, (RUH), Bath site houses a small satellite laboratory offering an urgent bacteriological service, processing all blood cultures and cerebrospinal fluids (CSFs) from RUH inpatients. Other urgent specimens may be processed by arrangement, but the remaining routine inpatient, outpatient and GP specimens are transported to the main Bristol laboratory regularly during the extended working day. RUH employed Microbiology Consultants are on site, who, with the other members of the team in Bath are able to offer a full clinical service, including control of infection.

Unity Sexual Health Clinic

A satellite laboratory is situated within the Unity Sexual Health clinic, Tower Hill, Bristol and provides near patient molecular testing for C.trachomatis, N.gonorrhoeae and T.vaginalis. This laboratory is staffed on a rotation basis by individuals from the main Virology dept and the Infection Sciences laboratory retains oversight of this service.

Reference laboratory services

The PHE supports several reference laboratories nationally, one of which is part of the combined Infection Sciences Laboratory.

Mycology Reference Laboratory (MRL) enjoys an international reputation for excellence and provides a comprehensive national service for the diagnosis and management of fungal infection. This includes the timely detection of a wide range of fungal biomarker, the isolation, identification and susceptibility testing of yeasts and moulds and provision of expert clinical advice. An antifungal drug assay service is provided in collaboration with the Antimicrobial Reference Laboratory. It also houses the National Collection of Pathogenic Fungi (NCPF) which provides reference and QC strains internationally.

In addition the North Bristol NHS trust supports a number of reference services, one of which is part of the combined Infection Sciences laboratory

Antimicrobial Reference Laboratory (ARL) – as part of BSAAS, the ARL provides a comprehensive antimicrobial assay service for the purpose of therapeutic monitoring and supporting consultative advice on the technical aspects and clinical interpretation of antimicrobial assays. The laboratory receives referred samples from all over the UK and Ireland.

The Laboratory also receives food, waters and other environmental specimens on behalf of the **Food, Water and Environmental Laboratory** which is located at the Porton laboratory and arranges their onward transportation

Finally, NBT also houses the administrative department and management teams, and provides the base for the laboratory transport and supplies.

The combined laboratories are well equipped to offer a comprehensive Clinical Infection Sciences service and are pleased to accept any enquiries and feedback from all who use the service.

The combined services provided by the Infection Sciences laboratory is documented in this user manual and both laboratories' scopes have been accredited by UKAS (PHE Accreditation No. 8043 & NBT accreditation No. 8099). The laboratory services have been assessed against the ISO15189 standard and the schedule of accreditation can be found via the links below:

- NBT Microbiology

https://www.ukas.com/wp-content/uploads/schedule_uploads/00007/8099%20Medical%20Single.pdf

- PHE Public Health Laboratory

https://www.ukas.com/wp-content/uploads/schedule_uploads/00007/8043%20Medical%20Multiple.pdf

NORMAL HOURS OF SERVICE

The Laboratory operates a 24/7 service on the following basis:

North Bristol Site		
Monday to Friday	09:00h – 17:15h	Routine laboratory hours
	17:15h – 09:00h	Late shift/On call
Saturday, Sunday & Public Holidays	08.00h – 17.00h	Routine laboratory hours
	17:00h – 08:00	On call
RUH Site		
Daily	09:00h – 17:00h	Routine laboratory hours
	17:00h – 09:00	On call

Specimen processing protocols during these hours will be determined by dept. and the type of request. See Appendix 2 for details

The laboratory can be contacted for routine enquiries and clinical advice during normal working hours as given above. Outside of these hours you should contact the on call service to arrange out of hours testing or to seek clinical advice.

URGENT REQUESTS

If results are required to assist with urgent clinical decisions, contact the laboratory to arrange urgent testing if during routine hours. The laboratory must be notified by telephone, even during normal working hours as without such notification the specimen will not be prioritised and will be processed with the routine batch. For urgent requests outside routine laboratory hours please contact on-call Microbiologist or Virologist, and/or BMS on-call via Trust switchboards. In addition, please mark the request form (if used) as 'URGENT'. This is particularly important at the RUH and UHB sites where specimens will be transported to the NBT site at routine scheduled transport times unless clearly marked as urgent and which may cause considerable delay in the availability of the result. If submitting. If submitting urgent requests to the laboratory using electronic ordering i.e. ICE, the laboratory must still be contacted and informed that the sample is being sent and urgent testing is required.

Please note that it is not sufficient to just label a sample as urgent and the laboratory must be contacted to notify them of testing requirements.

Please note it is the responsibility of the clinical team requesting the urgent testing to organise urgent transport of samples to the laboratory.

OUT-OF-HOURS SERVICES

The Bacteriology & Virology depts. offer a 24 hour 7 days a week on-call service for clinical advice and urgent specimen processing, covering all times outside of normal hours as follows:

Bacteriology

The laboratory offers a restricted out-of-normal hours service on both sites. A qualified, state registered Biomedical Scientist (BMS) is always 'on-call' to process urgent specimens and a member of the Medical Microbiology staff is always available for clinical advice.

Contact details:

- **On-call BMS**
  - Bacteriology, NBT site – via the NBT switchboard Tel No: 0117 950 5050
  - Bacteriology, RUH site - via the RUH switchboard Tel No: 01225 428 331
- **Medical Microbiologist (including infection control)**
  - Bacteriology, BRI site - via the BRI switchboard Tel No: 0117 923 0000
  - Bacteriology, NBT site – via the NBT switchboard Tel No: 0117 950 5050
  - Bacteriology, RUH site – via the RUH switchboard Tel No: 01225 428 331

It is the responsibility of the requesting doctor to contact the on-call BMS to process urgent specimens outside normal working hours.

Virology

A qualified, state registered Biomedical Scientist (BMS) is always 'on-call' to process urgent specimens and is contactable via switchboard to arrange testing in relation to urgent organ donations. For all other requests the clinical virologist on call should be contacted.

The Clinical Virologist can be contacted via the NBT Switchboard on 0117 950 5050. Requests should be made by medical staff or senior nursing staff. Please note that many tests undertaken

during normal working hours are available outside of routine laboratory hours (on-call, or at weekends).

Duty Incident management
The laboratory provide an out of hours rota so that a member of the Infection Sciences management team can be contacted in the event of a significant service delivery issue not relating to urgent testing requirements. This may include but not be limited to issues with estates,accommodation, national outbreaks or incidents that require local management coordination.

Contact the on-call duty incident manager via the NBT switchboard on 0117 950 5050.

Public Holiday Arrangements
A small team of staff will work in the Bacteriology and Virology laboratories to complete work form the day before and perform essential tests. They are not available for routine work or enquiries but will provide an on-call service for urgent requests only. Please contact the Bacteriology department via NBT/RUH Switchboard as above and Virology via the NBT switchboard.

Please note that out of hours service is not routinely available for the MRL or ARL.

SPECIMEN COLLECTION – GENERAL GUIDELINES

Consent for testing
The laboratory does not seek to confirm that informed consent has been obtained for any specimen that is sent for analysis. It is the responsibility of referring clinicians to ensure appropriate consent has been obtained. Requesting a specific test implies patient consent has been obtained. Where this is impossible, testing should only take place when it is in the best interests of the patient. The General Medical Council provides guidance which should be consulted on this issue. Under normal circumstances, the laboratory does not require separate consent documentation to be sent with the request form. Where appropriate, this should be documented in the patient notes. The laboratory may perform additional tests that were not originally requested when such tests are necessary to confirm results from a requested test, or to clarify a result from a requested test- an example of this would be hepatitis C RNA testing of a hepatitis C antibody positive sample. There is the potential to request further tests on a specimen already received in the laboratory. These tests can be requested by telephoning the laboratory, but in certain circumstances written confirmation may be required. Service users should note that samples are only kept for limited times

Specimens are often received with insufficient or very brief details of a clinical condition (e.g. rash) associated with imprecise requests (e.g. viral screen). In this setting, further information may be sought before tests are selected, or the laboratory staff may select a limited range of tests.

The advice on the collection of specific common specimens is not intended to be exhaustive. Some patients who are infected or colonised with certain infectious agents require special precautions when taking specimens and for their transport.

Further information – patient specimen collection
Guidance on specimen collection and additional information on laboratory tests can be found through the links below;

- https://www.nhs.uk/NHSEngland/AboutNHSservices/pathology/Pages/pathology-services-explained.aspx
- https://labtestsonline.org.uk/

Patients may be required to collect samples in their own homes depending on the sample type e.g. urine, faeces or specimen time e.g. EMU. Information relating to this can be found on the link below:

- https://www.nhs.uk/common-health-questions/

and specifically:

- https://www.nhs.uk/common-health-questions/infections/how-should-i-collect-and-store-a-stool-faeces-sample/
- https://www.nhs.uk/common-health-questions/infections/how-should-i-collect-and-store-a-urine-sample/

Sample integrity

Specimens submitted for certain laboratory procedures should be transported to the laboratory ASAP or according to transport requirements as indicated in Appendix 2. Special requirements may include specific temperature e.g. transport on ice, sample separation prior to transport e.g. EDTA samples for quantitative analysis for viral load, specific transport medium e.g. VTM.

Samples which have specific transport requirements may not be tested if received in the laboratory having been transported inappropriately. Please contact the laboratory if further advice is required.

Specimens should be transported to the laboratory as promptly as possible. Specimens, particularly blood, should be obtained in strict accordance with guidelines to prevent needlestick injuries. Specimens should be collected using strict aseptic technique in order to minimise contamination by endogenous flora.

Sample containers are labelled with “expiry” dates and care should be taken not to use containers which have exceeded this. The laboratory is unable to guarantee the validity of the results if an expired container is used and if found will review whether it is appropriate to continue with testing or reject the sample and request a repeat.

Reference and adherence to the following guidelines on the control of clinical material is complied with:

1) The Retention and Storage of Pathological Records and Archives, a Report of the Working Party of the Royal College of Pathologists and the Institute of Biomedical Science 2015.
2) The Human Tissue April 2017.

Protecting Personal Information.

North Bristol Trust and Public Health England has a legal obligation to comply with all appropriate legislation in respect of data, information and IT Security. Both organisations also have a duty to comply with guidance issued by the Department of Health and Social Care, the NHS Executive, other advisory groups to the NHS guidance issued by professional bodies.

REQUESTING OF LABORATORY TESTS

Electronic Requesting

Where this is available please use whenever possible as it enables more rapid receipt and processing within the laboratories. All infection sciences requests are available on the electronic patient record held in the electronic requesting system e.g. ICE. Please answer all questions and include RELEVANT clinical details. If there is a history of a particular risk e.g. recent travel to an area of risk this must be included. Please ensure that details of risk is included on all requests irrespective of test requested as this information is essential to ensure that the correct laboratory precautions are taken when processing all samples, e.g. risk of a particular viral pathogen associated with travel should also be included in bacteriology requests details (see section on High risk samples).

It is important to ensure that the correct system (barcoded) number is attached to the correct specimen before placing inside the specimen bag.

Please ensure that you order the correct test(s) and select the correct specimen type as failure to do this may lead to incorrect testing or a delay in result. The electronic requesting systems currently available in the local trusts have been created to show those tests most commonly requested for Infection Sciences, should the test you require not be visible please contact the laboratory to check that the test is available. Some tests are embedded within clinical syndromic profiles (e.g. rash contact), please also check these if a test is not individually listed.

It is extremely important to include clinical details when sending specimens for Infection Sciences to ensure correct processing and interpretation of results. This information is the same as that currently required on handwritten request forms and should include clinical details and symptoms as well as information on antibiotic use (dosage information e.g. pre/post), foreign travel, outbreaks, date of onset etc.

Request forms

The majority of requests from the Bristol and Bath area will be made through the local electronic ordering system. These requests are then activated once the specimen has been received in the laboratory. If electronic requesting is not possible then a request can be made by completing the relevant request form available from your local trust. Please see below for minimum data required for these types of requests.

For samples referred to the laboratory for specialist tests referral request forms can be obtained on request as below:

Antimicrobial reference laboratory – https://www.nbt.nhs.uk/severn-pathology/pathology-services/antimicrobial-reference-laboratory/antimicrobial-reference-0
Mycology reference laboratory - https://www.gov.uk/government/publications/mycology-reference-laboratory-mrl-service-user-handbook
Virology specialist services – ISQuality@nbt.nhs.uk

The referral request forms have been designed so that the appropriate test can be indicated and associated information is provided when sending samples to the laboratory. Please ensure that referral request forms are used, photocopies of original forms or samples submitted on multi-forms may result in the incorrect tests performed or required tests may be missed.

Completion of Request Forms

Poor or illegible handwriting may be misinterpreted and result in report delay or incorrect test selection. Please help to minimise this by completing all sections of the appropriate request form using a ballpoint pen. It is important to fill in the relevant request box by placing the 'X' accurately within the box. This will facilitate the requesting process and improve speed of booking the patient onto the laboratory system.

Printed patient addressograph labels are preferable to minimise error. Where addressograph labels are used, please ensure that the current Consultant and Location of the patient are added if these details are not on the label attached. Failure to do so may result in a delay of results as details are required for the delivery of hard copy reports.

It is **essential** that a summary of the relevant clinical details and therapy (if relevant) is included, for correct laboratory processing of the specimen and interpretation of results. It is important that a minimum data set is available to ensure that results are assigned to the correct patient and returned to the correct clinician. Please provide the name and contact details of the requesting healthcare worker or telephoning of important results may be significantly delayed or impossible.

Please include the following information on the request form:

PLEASE NOTE: One other unique parameter i.e. NHS or Hospital No or date of birth is required in addition to patient first name and surname to ensure that the request is matched to the correct patient record on the laboratory database. For requests from patients submitted under unique coded identifiers e.g. GUM Numbers, the number and date of birth is required.

Failure to provide sufficient patient identifiers on the request form may result in the rejection of the request or a delay in processing of the sample.

NHS Number (preferred where available)
Hospital number (if available).
Date of birth

One of these is essential (to match sample)

Surname (or unique coded identifier) (please PRINT) (**Essential**)
First name(s): (**Essential**)
Gender:
First line of patient address & postcode:
Ward or location: (**Essential**)
GP code/Consultant in charge:
Bleep or contact number of the staff requesting the test:
Address for report: if different from location
Specimen type: (**Essential**)
Test(s) requested: (**Essential**)
Date and time of sampling: (**Date Essential, Time essential for certain requests**)
Infection Risk status (Essential if applicable):
Additional information in clinical details should include (Essential):

- Details of foreign travel, occupation (where relevant), contact with infectious diseases
- Additional details of sampling sites if relevant
- Details of recent, current and intended antimicrobial therapy
- Date of contact, date of onset and duration of illness (essential for serology)

Other relevant clinical information including immune status and vaccination history of patient if known. Please ensure that details of risk is included on all requests irrespective of test requested as this information is essential to ensure that the correct laboratory precautions are taken when processing all samples, e.g. risk of a particular viral pathogen associated with travel should also be included in bacteriology requests details.

Failure to complete forms correctly results in delay and inefficiency. Reports often fail to reach the correct location because of incorrect ward, consultant or GP codes.

Labelling of Specimens

It is essential that all specimens are carefully labelled and dated to ensure that the correct analysis is attributed to the correct patient. Specimens requested electronically **MUST** be labelled with the system generated label. Non - electronically requested specimens should be labelled with the following information:

NHS number or Hospital Number (if available) **or Date of birth (One Essential)**
Surname (please PRINT) **or unique coded identifier (Essential)**
Full Forename (Essential)
Date of specimen
Site of sampling / specimen type

If unsure about the availability or value of any test, please contact the laboratory prior to taking a specimen.

Failure to comply with these guidelines may lead to the rejection of the sample. Specimens should be placed in appropriate containers and it is especially important that those containing pus, fluids or blood should be shut tight as leakage in transit may result in the sample being discarded or may make analysis difficult or invalid and pose an obvious hazard to others

REJECTION POLICY

Incorrectly/Unlabelled specimens

The laboratory regularly receives specimens that are unlabelled or incorrectly labelled (patient name/dob on specimen differs from that on form or electronic request). We are unable to process these specimens and they will generally be rejected. Any such specimens which are difficult to repeat (CSFs, tissues etc) or cannot be repeated (pre dose treatment measurements, post mortem samples) will be discussed with requesting healthcare professional. However, these specimens will only be processed in exceptional circumstances and a comment will be added to the report to alert the requestor to the laboratory concerns relating to the identity of sample and thus the reliability of the results in relation to patient management. In addition clinical teams may be asked to provide assurance of sample origin or to correctly label the specimen.

Inappropriate sample type

Where inappropriate specimens are submitted for tests requested a report will be issued requesting submission of the correct sample.

These specimens will not normally be processed and will generally be rejected. Any such specimen that is difficult to repeat (as above) will be stored for a period of time. Other specimens may be rejected see section on relevant specimen types.

Other specimens that are unsuitable for microbiological examination and thus rejected include the following:

- unlabelled or improperly labelled specimens
- specimens received in leaking, cracked or broken containers
- specimens received in containers, the external aspects of which are contaminated
- unpreserved specimens received more than 12 hours after being collected

Specimens should be transported in sterile containers. If transport is to be significantly delayed, a suitable transport medium/device should be used or the specimen refrigerated in order to optimise testing; specimens that should not be refrigerated include blood cultures, CSF and those that might contain *Neisseria* spp. (Genital or Throat swabs) or *Haemophilus influenzae*.

High risk specimens

Although a 'Universal Precautions' policy is adopted in the laboratory, specimens taken from patients known or suspected to present a health hazard to laboratory staff e.g. TB, typhoid and paratyphoid, brucellosis, should be clearly labelled "DANGER OF INFECTION" on both the form and specimen. This is especially important when sending specimens of tissue, blood or other body fluids. **This requirement enables the laboratory staff to implement immediate, appropriate prophylaxis and advice should an accident occur.**

Certain organisms are classified as being serious biohazards. Information can be found at http://www.hse.gov.uk/pubns/misc208.pdf. They require specialist laboratories designed for containment during manipulation of specimens and cultures**.**

Specimens should NOT be taken or sent to the laboratory from patients suspected as having the diseases which fall into the following categories without consulting the Medical Microbiologist/Virologist.

- Hazard group 3 (e.g. rabies, Avian Influenza)
- Hazard group 4 pathogens (e.g. viral haemorrhagic fevers)

Please note: this list is not exhaustive, if there is any suspicion of a high risk atypical organism please contact the laboratory to discuss.

Where such specimens are submitted to the laboratory please ensure that the request form is clearly labelled with 'DANGER OF INFECTION' and use unambiguous and commonly recognised terminology. Failure to do this may result in specimen delay, inappropriate testing and risk to laboratory staff.

Such samples must never be transported to the laboratory in the pneumatic tubes system and the laboratory must be contacted prior to the sample being sent so that appropriate arrangements can be made.

Samples from patients receiving radioactive isotopes

Should there be a requirement to submit a sample for testing from a patient who has undergone radioactive therapy; the laboratory **MUST** be contacted **BEFORE** sending the sample to discuss risk associated with particular sample type.

MEDICO – LEGAL SPECIMENS

Any specimens submitted for medico – legal purposes should have documentation accompanying these specimens to provide an unbroken chain of evidence. Please note that the laboratory is not a

forensic laboratory and does not provide a forensic level service for specimen analysis. The laboratory is only able to provide a clinical testing service for these specimens.

The Bristol Infection Sciences Laboratory medico-legal procedure and Chain of Evidence form are based on recommendations from the Royal College of Pathologists and may be requested from the laboratory. Please ensure that the box relating to consent for the storage of samples post processing by the laboratory has been completed appropriately.

COMPLIANCE WITH THE HUMAN TISSUE ACT

Submitting tissue samples from deceased patients

The Bristol Infectious Sciences Laboratory is not licensed by the Human Tissue Authority (HTA) to store tissues from deceased patients. Post mortem samples are submitted to the laboratory by coroners or pathologists for examination to help them determine the cause of death.

Obtaining consent to remove, store and use human tissues for a scheduled purpose is one of the underlying principles of the Human Tissue Act. Unless the laboratory is informed that consent has been obtained or the coroner has requested that samples are retained for further testing, residual sample will be disposed of or returned (when requested on at time of receipt) on completion of testing and after the final report has been issued. Please note blood samples are exempt from this and will be stored according to normal laboratory protocols.

TRANSPORT ARRANGEMENTS

All specimens should be transported to the laboratory as rapidly as possible after collection to avoid compromising results. Specimens may be transported via normal portering rounds/transport arrangements during the normal working day. When virology, bacteriology and/or mycology tests are to be performed, on the same specimen, a separate specimen for each laboratory is preferred to ensure timely receipt and processing in each laboratory. Urgent virology specimens taken out of hours should be discussed with the Duty Virologist before dispatch to the laboratory.

Non-urgent specimens collected outside routine laboratory working hours may be stored overnight in the refrigerator, with the exception of those that might contain Neisseria spp. (Genital or throat swabs) or Haemophilus influenza

Blood cultures should never be refrigerated but sent directly to the site specific laboratory reception.

Blood cultures

Blood culture samples submitted for incubation are now received and incubated on site for all 3 laboratory locations.

- **RUH**

Blood culture bottles are received and loaded up until 22:00 by the Infection Sciences staff on an instrument located within the RUH Pathology in the hot lab.

- **NBT**

Blood cultures taken within wards on the NBT hospital site are received and loaded up until 22:00hrs by the Infection Sciences staff onto instrumentation located within the main NBT Infection Sciences laboratory

- **UHBristol**

Blood cultures taken within the UHBristol hospital are received and loaded onto instrumentation located within the UHBristol Pathology specimen reception.

NBT

Samples from the NBT hospital site can be transported via the pneumatic tube system (see below) or by regular porter collections.

UHBristol

Transport from within the UHBristol is provided by porters who undertake several ward and department collections throughout the day. There are also regular deliveries from all UHBristol hospital sites direct to laboratory medicine at UHBristol. The UHBristol pneumatic tube system may also be used where appropriate (see below). Specimens are transported to the NBT site via regular courier transport runs from the UHBristol site. Urgent specimens out of hours should not be sent before agreement with the laboratory on-call staff and should be dispatched to UHBW Pathology reception at the BRI site immediately if agreed. An urgent courier will be arranged by on-call staff.

GP Practices

Regular van collections are scheduled for all GP Practices during the working week, using pre-arrange couriers (City sprint). Surgeries should place specimens in an individual specimen container inside a sealed specimen bag. This should then be placed in a large sealable specimen bag along with other specimens destined for the same pathology laboratory with sufficient tissue to absorb the contents. Specimens waiting collection should be held in a secure area of the premises until collected by the driver.

The driver will transport specimens from the surgery to the van and place the bag of specimens in the appropriate plastic box fitted in the van, securing the lid. The plastic boxes in the van will be padded with cushioning and absorbent material and be labelled appropriately with the transport mark. The driver will then carry the boxes to the appropriate pathology reception where they will be emptied, and take the empty transport boxes back to the van.

In the event of an accident or spillage away from the Trust the drivers should follow instructions with the spill kit on each van.

Specimens sent by post should be sent in accordance with the relevant Transport Regulations, a copy of which is available from the laboratory on request.

Royal United Hospital Bath NHS Trust

Internal transport of samples at the Bath site is under RUH Trust management. This consists of regular RUH portering rounds and van transport between GP practices. Urgent transport of samples on site is undertaken by RUH portering staff. Regular transport of specimens from Bath RUH pathology reception to NBT is undertaken by couriers. Departure times from Bath are:

	Collection time from Bath	Arrival time at Bristol
Mondays to Friday	0900h	1000h
	1300h	1400h
	1500h	1600h
	1700h	1800h
Weekends (Sat and	0915h – 0930h	1000h – 1030h

Sun/Bank holidays) Couriers		

Samples which are received in the RUH Pathology department after the stated times will be sent on the next available transport. However, samples received after 1700h will not be transported to the Bristol NBT laboratory until the following day on the 0900h transport.

Some urgent specimens may need to be sent to the Bristol laboratory for processing out of hours or at weekends e.g. BAL specimens. Packaging and transport of these specimens should be arranged through the on call BMS via the RUH switchboard. Clinical discussion about the patient with the Consultant Medical Microbiologist on call may also be helpful.

Use of the pneumatic tube system

The UHBristol and the NBT site each have a pneumatic tube system. These are connected to the respective pathology dept. on each site. All appropriately packed, urgent specimens for Infection Sciences may be sent via NBT pneumatic tube if on the NBT site with exception to the following;

- Samples with a volume of more than 50mL
- Samples requiring containment level 3 e.g. Mycobacterium investigation
- Samples from patients which have a potential hazard group 4 risk e.g. viral haemorrhagic fever
- Samples sent in glass specimen containers

Ensure that specimens are taken into the appropriate leak-proof specimen container or tube and sealed in either a bag/form combination or in a polythene specimen transport bag accompanied by a completed request form in a separate pocket of the transport bag or a clearly visible request label on the specimen Place the specimen, sealed in a bag as described above, in an appropriate ‘pod’ and ensure that the specimen is surrounded by sufficient hand towel or other absorbent ‘wadding’ to help prevent breakage and absorb spillages

ENQUIRIES

Computer Accessing of Results

All completed results are available on the computer system. Results should be accessible for all NHS users (or users with an N3 email) via ICE or open ICE depending on location and is the recommended method of accessing all patient results. Accessing results in this way is quicker, more secure and accurate and ultimately faster than telephoning the laboratory.

Certain results are routinely communicated to the clinician by telephone, or in person by the clinical staff. This will be determined by the result in combination with the clinical details provided.

Clinicians having specific concerns about patients are encouraged to contact the Department to obtain advice about their investigation and further management. Early consultation about patients may result in more rapid analysis of specimens with results being available more quickly to the clinician as well as providing direction on antimicrobial and other management. Similarly those in doubt about appropriate infection control procedures are encouraged to contact either an infection control nurse or medical microbiologist for the relevant trust.

If the result is not yet visible and the result is still required urgently for clinical management of the patient then please telephone the laboratory. Incomplete results will not be communicated the

pending results may lead to a change of interpretation, or the actual results may be altered or updated at the time of completion under exceptional circumstances.

Results will **not** be given by telephone directly to the patient named on the request form, regardless of whether he or she is a member of the healthcare staff. It is particularly important to note that results required by occupational health that may impact on fitness to practice, for example hepatitis B serology, can only be requested by, and returned to, that department.

In order to protect patient confidentiality, results can only be given to members of the patient's healthcare team (this comprises the people providing clinical services for the patient and the administrative staff who directly support those services)

Staff should not send self-referred specimens; all specimens should be submitted from either a GP, occupational health, or other hospital department or staff.

Laboratory Fax policy
It is laboratory policy not to fax results outside of exceptional, pre-agreed arrangements. Where a pre-agreed criteria has been set up the laboratory is only able to send e-faxes to secure locations.

Telephone enquiries

Please restrict these as far as possible for results that are not yet available on the hospital computer but expected, or for those requiring clinical discussion. Refer to Turnaround Time (TAT) guidelines given on Appendix 2

Results from Urgent Requests
Results from urgent bacteriology specimens sent from outside the 3 Trusts (NBT/UHBristol / RUHT) will be telephoned as soon as they are available but should also be available on electronic systems for lookup.

Results from within the NBT/UHBristol / RUHT will be accessible on the computer as soon as they are complete. Please note that urgent virology results may not be available on the computer until the next working day, but significant results will be telephoned. Please restrict telephone enquiries to those requiring clinical discussion

Clinical Enquiries and advice
Clinical advice is available from the medical virologists and microbiologists and senior clinical scientific staff throughout normal working hours using the departmental numbers listed in Appendix 1. Information on specimen collection and test selection can be found in Appendix 2

Out of hours clinical advice may be accessed via NBT/UHB/RUH switchboard and asking for the on-call medical microbiologist/virologist.

Additional Tests
Occasionally additional tests may be required by the requestor on samples already submitted to the laboratory. If additional tests are required please contact the laboratory to discuss.

Additional tests should be requested as soon as possible after the initial request as retention times vary depending on sample type. Samples requiring additional investigations will be considered on a case-by-case basis depending upon specimen type and investigation requested.

Uncertainty of Measurement/Result

Any test/procedure performed in the laboratory may be subject to a variety of factors that may influence the outcome of the test. These may occur at one of 3 stages;

- Pre-examination
- Examination stage
- Post-examination

By reviewing those factors which could adversely influence the outcome of the test e.g. transport, correct specimen requirements, storage conditions pre-testing etc and implementing control measure to reduce or remove such factors, the outcome becomes more accurate and hence provide assurance to service users of the quality of the results produced by the laboratory.

In addition there can be a level of variability associated with quantitative results that the laboratory can calculate and monitors to provide continuous information on the performance of procedures, details of which can be provided on request. Please contact the Quality manager (Elisabeth.North@nbt.nhs.uk) if you would like further information.

Complaints Procedure

The laboratory is committed to providing a high quality service to all service users however it understands that aspects of the service may not meet the requirements of the customer at all times, should this occur and there be a requirement to make a complaint to the laboratory please submit this in writing to one of the following:

- Dr Kim Jacobson – Infection Sciences Clinical Lead
- Mr Jonathan Steer – Infection Sciences Service Manager
- Mrs Elisabeth North – Quality Manager

To raise a concern or complaint with the laboratory service the following email can be used to contact the quality team; ISQuality@nbt.nhs.uk

REPERTOIRE OF TESTS / SERVICES

Whilst most commonly requested tests are undertaken within this laboratory some are referred to specialist reference laboratories. The list below, although not exhaustive, gives an indication of this laboratory's repertoire

BACTERIOLOGY

North Bristol Hospital site

- Clinical advice / Infection Control
- Routine bacteriological examination (microscopy and culture) of the following clinical specimens:
    - Blood cultures
    - Bronchoalveolar lavage/washings
    - Cerebrospinal Fluid
    - Faeces
    - Fluids, aspirates, pus and swabs from all sites
    - Genital specimens
    - Ocular specimens
    - Sputum
    - Urine
- Routine microscopy for mycobacteria and culture of all clinical specimens except blood cultures
- Routine mycological examination (microscopy and culture) of the following clinical specimens:
    - Skin
    - Hair
    - Nails
- *Helicobacter pylori* faecal antigen
- *Clostridium difficile* toxin
- Cross Infection Screening
- Susceptibility testing

Royal United Hospital, Bath Site

The satellite laboratory at the RUH performs a restricted range of tests on-site. The majority of specimens are transferred to NBT for processing. The on – site repertoire includes:

- Clinical advice / Infection Control
- Routine bacteriological examination (microscopy and culture) of the following clinical specimens:
    - Blood culture
    - Cerebrospinal Fluid
    - Susceptibility testing
    - Urgent specimens (all except faeces, sputa or other Containment level 3 categorisation)

United Bristol NHS Trust site

- Clinical advice / Infection Control
- Receipt and incubation of blood cultures (samples which flag as positive are sent to the main laboratory NBT site for further investigation)
- Rapid Influenza and RSV molecular testing for UHBristol hospital locations only

MYCOLOGY Reference Laboratory

The Mycology Reference Laboratory (MRL) provides a comprehensive service for the diagnosis and management of fungal infections through the provision of specialist laboratory services and expert clinical and technical advice.

A user manual is available for the services offered by the Mycology Reference Laboratory and is available at https://www.gov.uk/government/publications/mycology-reference-laboratory-mrl-service-user-handbook

ANTI-MICROBIAL Reference Laboratory

The Anti-microbial reference laboratory (ARL) provides a comprehensive service for therapeutic drug monitoring through the provision of specialist laboratory and clinical services.

A user manual is available detailing services at the link below;
http://www.bcare.nbt.nhs.uk/services/clinical-antimicrobial-assays

VIROLOGY

North Bristol Hospital site

- Clinical advice / Infection Control
- Bronchoalveolar lavage/washings and sputum for Direct Immunofluorescence (IF) for *Pneumocystis jiroveci*
- *Legionella pneumophila:* urinary antigen*
- *Streptococcus pneumoniae:* urinary antigen*
  * Test results and clinical advice managed by consultant microbiologists
- *Nucleic acid amplification tests (NAAT)for the following*
  - Respiratory viruses (Influenza A and B, RSV, human metapneumovirus, adenovirus, parainfluenza viruses 1,2,3 & 4, rhinovirus)
  - SARS-CoV-2
  - Chlamydia trachomatis
  - Neisseria gonorrhoeae
  - CMV (quantitative/qualitative)
  - HSV 1 and 2
  - Hepatitis C (qualitative and quantitative, optional genotyping)
  - Hepatitis B (quantitative)
  - Parvovirus
  - HIV (quantitative)
  - Adenovirus (quantitative/qualitative)
  - BK virus (quantitative)
  - Enterovirus
  - VZV
  - EBV (quantitative)
  - Gastroenteritis viruses- norovirus, adenovirus, rotavirus, astrovirus and sapovirus
  - HHV6
  - Measles
  - Pertussis
  - M.genitalium
- Susceptibility/resistance testing to oseltamivir (Pandemic vH1N1 2009 influenza only)

- Serological tests for the following:
  - Adenovirus
  - Anti-DNAse B, Antistreptolysin (ASO)
  - Borrelia burgdorferi (Lyme) IgG & IgM
  - Brucella
  - Chlamydia trachomatis (qualitative, infertility investigation only)
  - Chlamydia antibody CFT (includes but does not distinguish between psittaci, pneumoniae, and trachomatis) Coxiella burneti (Q Fever) IgG & IgM
  - Cytomegalovirus IgG & IgM
  - Epstein Barr Virus (EBV) IgG & IgM
  - Hepatitis A, B, C, and E IgG & IgM (Not Hepatitis C)
  - Herpes simplex virus (does not distinguish between types 1 and 2)
  - HIV 1 and 2 antigen/antibody and antibody only
  - HTLV 1 and 2 antibody assay
  - Influenza A and B
  - Measles virus IgG & IgM
  - Mumps IgG
  - Mycoplasma pneumoniae
  - Parvovirus B19
  - Pertussis (Bordetella pertussis; whooping cough)
  - RSV (Respiratory syncytial virus)
  - Rubella
  - Syphilis IgG & IgM
  - Toxoplasma IgG & IgM
  - Varicella zoster IgG

United Bristol NHS Trust – Unity Sexual Health clinic

- *Nucleic acid amplification tests (NAAT)for the following*
  - Chlamydia trachomatis
  - Neisseria gonorrhoeae
  - Trichomonas vaginalis

COLLECTION OF SPECIMENS AND INTERPRETATION OF RESULTS

Where both Virology, Mycology and Bacteriology testing is required it is advisable to send separate sample to each laboratory.

Laboratory Turn Around Times (TAT)

Laboratory Turnaround Time is monitored from the time of receipt of the specimen into the laboratory LIMS to the results being available electronically. It does not include transport time from the requestor or postal time for a hard copy report. The expected turnaround time for tests where no available coding is indicated will depend on the test requested.

Please note that turnaround times are influenced by the type of specimen, investigation and the need for further / confirmatory tests, as well as the transport arrangements between the laboratory and the requesting hospital or practice.

BACTERIOLOGY

The final identification and susceptibility testing of some organisms can take several days and may even need referral to a reference laboratory. In this situation, preliminary results will be issued as soon as practicable.

Inappropriate specimens include the following:

- sinus tract specimens from patients with suspected osteomyelitis
- surface swabs from diabetic or decubitus ulcers that do not look infected
- routine catheter specimens of urine i.e. in the absence of signs or symptoms of infection
- nasal swabs from patients with suspected sinusitis
- high vaginal swabs from patients with suspected pelvic inflammatory disease, but with no vaginal discharge or other evidence of infection on examination
- Urine catheter tips

Specimens of tissue, fluid, pus and exudates are always preferable to swabs. Collect the sample into a white top universal, or, only if this is not possible, take a swab. If using a swab, please request wound swab for MCS.

Culture results

Bacterial culture results may be reported semi-quantitatively i.e. scanty, moderate, heavy etc. however this nomenclature is not an indication of severity of infection and appropriate advisory comments will be included on the final report.

Blood cultures

Blood cultures are used to detect the cause of an infection leading to bacteraemia or fungaemia. The results are important because they help guide appropriate treatment. It is generally not recommended that general practitioners take blood culture samples as patients who require a blood culture usually require hospital care and the delay in incubation of the bottles may compromise results.

The blood culture status is continually monitored by the laboratory, and the sample is usually incubated for 5 days. All blood cultures are treated as urgent specimens so the laboratory does not need advance notification of them being taken. However if there is of increase risk e.g. due to details of foreign travel, suspected enteric fever, or brucellosis, the laboratory should be notified in advance of any high risk blood culture being sent.

Results of all significant positive blood cultures will be telephoned to a clinician as soon as they become positive. As the isolation time depends upon the organism and the initial inoculum, this may vary from a few hours, up to five days after receipt.

Blood cultures should only be taken when there is a reason to suspect infection. They should not be taken for routine assessment. Reasons to suspect an infection and consider taking blood cultures include, but are not limited to:

- The core temperature is outside of the normal range - less than 36°C and more than 37.8°C.
  - Tachycardia – HR ≥ 90 beats per minute
  - Breathlessness or tachypnoea - ≥ 20 breaths per minute
  - Chills or rigors.
  - Development of unexplained confusion.
  - The presence of focal signs of infection.
  - The white blood cell count is outside of the normal range.

Additional Paediatric Indications

- Toxic appearance, including lethargy
- A drop in the Glasgow Coma Score
- Increase capillary refill time
- Increased pulse and respiratory rates
- Thrombocytopaenia in neonates

Not all patients with the above symptoms will require blood cultures (e.g. a low grade fever within 24 hours of surgery is non-specific and is unlikely to represent a bacteraemia). Conversely, this list is not exclusive and blood cultures may be required in some patients who do not have any of the above symptoms. In the very young, immunocompromised, or the elderly, signs of infection may be absent or minimal. Clinical judgement is required to decide when there is a reasonable possibility that a patient has an infection where blood cultures may be useful.

Ordering

Blood culture sets may be ordered from Pathology consumables dept. The standard blood culture set consists of two bottles (one aerobic and one anaerobic). A single paediatric bottle is available for neonates and infants. Special blood culture collection sets are available to facilitate the safe taking of blood cultures using a butterfly collection set (see bottle set insert for details).

Volume of blood per bottle

The ability of a blood cultures to detect a bacteraemia or fungaemia increases with the volume of blood submitted; a blood culture set containing only half the recommended volume of blood) will miss approx. ¼ of the bacteraemias that would be detected by a proper filling the bottles indicate the required fill volumes.

Number of blood culture sets per septic presentation

Data shows that the percentage of diagnosed bacteraemia increases where more than one set of blood culture bottles are submitted. If sepsis persists for > 48 hrs without a diagnosis then a discussion with a medical microbiologist and further blood cultures may be indicated.

Timing and site of blood cultures

Submitting blood cultures taken from separate sites helps with interpretation of the significance of positive cultures. Blood culture sets should be taken before starting antibiotics. Blood cultures should be collected peripherally unless line-associated infection is suspected, in which case blood cultures from both peripheral and line should be collected. The blood culture sets do not have to be taken at different times. Blood cultures must not be taken from existing central or peripheral venous cannula. The only exception to this is if it is believed that a central line may be the source of bacteraemia. It is then appropriate to take blood from both the central line and from the peripheral vein. The peripheral vein sample should be collected first. Blood cultures must only be taken from a central line if blood cannot be obtained from a peripheral vein or when a line sepsis is suspected.

Aseptic technique

Approximately 1/4 of positive blood cultures are due to skin organisms, many of which are likely to be considered as contaminants. This can have significant consequences for your patient, in terms of unnecessary antibiotics and repeat cultures. Careful aseptic technique is mandatory. Blood cultures must be taken using a new venepuncture site.

a. Disinfect the skin carefully at the venepuncture site using a chlorhexidine/alcohol wipe and allow to dry before piercing the skin. If the patient has intolerance to chlorhexidine. Povidone iodine 10% must be used as an alternative if the patient is sensitive to chlorhexidine.
b. If blood is also being taken for other tests (e.g. biochemistry and haematology), the blood culture bottle must be filled before the other bottles to reduce the risk of contamination.
c. When using the two bottle set and the butterfly and adapter cap system the aerobic bottle should be filled first to avoid the air in the butterfly tubing entering the anaerobic bottle.
d. Remove the plastic caps from the culture bottles, wipe the rubber diaphragms with the chlorhexidine/alcohol wipe provided, allow to dry and inoculate 10ml into each bottle
e. For paediatric bottles, add as much blood as possible up to a maximum of 4ml
f. Put the bottles in the plastic specimen bag and complete the request form or ICE request giving relevant clinical details. Please give details of other clinical symptoms or underlying disease and treatment given or anticipated.
g. Label each bottle with patient addressograph or ICE generated label PLUS add the actual date and time of collection and indicate if taken from a line (be specific about which line)
h. Blood cultures must be sent to the laboratory as soon as possible for incubation. They should NEVER be refrigerated

Contamination

Micro-organisms are present on the skin surface of patients, staff and the immediate patient environment which can result in contamination of blood cultures. Contamination can cause confusion and potentially, inappropriate treatment because it is sometimes difficult to determine if a positive blood culture is due to genuine bacteraemia or if it is a false positive result caused by contamination. Contaminated blood cultures also affect mandatory surveillance data. It is important to take blood cultures correctly in order to minimise the risk of contamination occurring.

Contamination leading to false positive result is defined as growth of bacteria in the blood culture bottle that were not present in the patient's bloodstream and were introduced during sample collection. This contamination can came from a number of sources:

- The patient's skin
- The equipment used to take the sample and transfer it to the culture bottle
- The hands of the person taking the blood sample

- The general environment
- Repeated opening and accessing of a central line has a high risk of introducing infection to the patient. There is also a higher contamination rate, and a positive culture from a line may not represent true bloodstream infection, but line colonisation.
- Blood cultures should not be taken from veins which are immediately proximal to existing venous cannula.
- Blood cultures should not be taken from the femoral vein as it is very difficult to disinfect the skin adequately, so there is a high risk of contamination.

Sending blood cultures to the laboratory

Mix the bottles and ensure they are correctly labelled; differentiate sets by labelling A&B, peripheral or central etc. It is important that the ICE label is placed down the sample tube (a good place is in the white space provided and not over the bottle bar code) does not overlap the bottom rim and that bottles are transported to the laboratory in plastic transport bags provided. If this is not possible they should be kept at room temperature. Do NOT refrigerate.

Clostridium difficile

There is evidence from several studies that diarrhoea developing in patients who have been in hospital for at least 3 days, is rarely caused by an enteric pathogen (i.e.. *salmonella*, *shigella*, *campylobacter* or *Escherichia coli O157*), the main exception being outbreak scenarios. *C. difficile* or other antibiotic associated causes of diarrhoea are much more likely. Please do not send faeces for MC&S as well as for *C. difficile* unless the patient fits into one of the following categories:

- in-patients suffering diarrhoea within three days of admission
- patients with suspected non-diarrhoeal manifestations of enteric infections
- adults with nosocomial diarrhoea if any of the following are applicable:
    - aged 65 or more
    - patients who are HIV positive
    - patients with neutropaenia
    - suspected nosocomial outbreak

Specimens from community patients are normally only tested for MC&S for enteric pathogens. However, those with the following criteria will also be tested for *C. difficile*:

- all aged 65 years or over
- recent hospitalization in those aged ≥ 2yrs
- recent antibiotic use in those aged ≥ 2yrs
- care / residential home outbreak

These details **must** be clearly stated on the request or testing or *C. difficile* may not be performed

For diarrhoeal stool specimens from patients between 2yrs and 64 yrs CDT testing will be performed when:

- They are hospital in-patients.
- They have a history of antibiotic use within the previous 6 weeks.
- Patients from any source with a history of antibiotic exposure
- Nursing home resident

Ova cysts and parasites

Routine screening for *Cryptosporidium sp and Giardia sp* is undertaken on all specimens received. There is no need to request this as a separate OC&P investigation. Three spoonfuls (included in

sample container) are all that is required for analysis and containers should not be filled more, unless the faeces is liquid when the pot should be filled to one-third full. If there is going to be a delay in transport of more than 3-4 hours the specimen should be refrigerated

For patients with relevant travel or clinical history at least 3 specimens of faeces, passed on different days should be sent for parasitology giving relevant clinical details. Please ensure that the collection dates are accurately recorded on each sample container.

Threadworm
"Saline wash" specimens are used in the diagnosis of threadworm. A kit and instructions on its use are obtainable from Pathology consumables dept.

Faeces
The microbiological examination of faeces is complex and requires a full clinical history including the possibility of food poisoning, foreign travel with the countries visited and the dates, and antimicrobial therapy, as well as the more basic information. Failure to give this information may mean important pathogens are not isolated. 3-5ml of stool is required for analysis and containers should not be filled more, unless the faeces is liquid when the pot should be filled to one-third full. If there is going to be a delay in transport of more than 3-4 hours the specimen should be refrigerated

Clinical details should include the duration of symptoms and relevant information, such as foreign travel, use of antibiotics, contacts, suspected food poisoning and whether the **diarrhoea is community or hospital-acquired**. If the diarrhoea is community-acquired, the specimen will be routinely investigated for *Salmonella, Shigella, Campylobacter, E.coli* O157 and parasites. If there are multiple cases of diarrhoea, *E.coli* O157 suspected and/or vomiting on a ward, a member of the Infection Control Team should be informed **as soon as possible**

Formed stool specimens will not be processed unless by special arrangement.

Fluids and Aspirates
Should be sent in a plain, leak-proof, screw-capped container. Ideal volume for testing is 3-20mL. Some fluids such as ascitic and peritoneal dialysis fluid benefit by inoculation directly into blood culture bottles. However, this method of analysis is not currently listed within our scope of accreditation. If blood culture bottles are sent **it is essential that a separate specimen is also sent in a plain leak-proof, screw-capped container for direct microscopy and direct culture** to ensure correct interpretation of results. Differential white cell counts are undertaken on all ascitic and peritoneal dialysis fluids. Cell counts and direct inoculation into blood culture bottles on other normally sterile fluids have not been found to be beneficial and should not be requested.

Genital *Chlamydia trachomatis* diagnosis
Nucleic acid amplification testing (NAAT) is the preferred method for detection of genital *C trachomatis* infection. Specimens should be taken using the specific collection kits supplied by the laboratory (Aptima collection tubes). The following specimens are appropriate:

<u>Female:</u>

- Endocervical swab - if visualisation of the cervix is required for another reason.
- Vulvo-vaginal swab (may be self-taken)

- First void urine or urethral swab – urine and urethral sampling alone is not recommended since infection may be missed; however, it is valuable when this is the only specimen available.

Male:

- First void urine or urethral swab.

All specimens received for Chlamydia NAAT are also routinely tested for *N. gonorrhoeae (GC)*. A swab for GC culture is also recommended to allow for susceptibility testing if isolated.

Cervical and high vaginal swabs (HVS)

These must be taken with the help of a speculum and sent to the laboratory in transport medium. It is important to avoid vulval contamination of the swab. For trichomonas, swab the posterior fornix. If there are obvious candidal plaques, swab the lesions. If pelvic infection is suspected, swab the cervical os.

An HVS alone is unsuitable for the diagnosis of gonorrhoea and investigation of Pelvic Inflammatory Disease. In the investigation of patients with lower abdominal pain who might have pelvic inflammatory disease, do not routinely take swabs if there is no vaginal discharge or if the clinical examination is normal. In this case an endocervical swab should be submitted for Chlamydia using the NAATS kit.

If Bacterial Vaginosis (BV) is suspected send an air-dried smear of the vaginal discharge for microscopy.

In the event of rape or sexual abuse, specimens should be referred to the Police dealing with the case.

There is no need to submit for culture an HVS or IUCD from a patient in whom actinomyces-like organisms have been seen on a cervical smear; these are constituents of the normal flora of the vagina.

Urethral Swabs

These may be useful for the diagnosis of gonorrhoea, chlamydial and other infections. They must be taken with care - avoid contamination with flora from the vulva or the foreskin. Small swabs are available for this purpose and should be sent to the laboratory as soon as possible in transport medium for bacterial culture or specific swabs for chlamydia

If a slide has been examined in the clinic or surgery, the result should be included with the clinical information.

Staphylococcus aureus (MRSA/MSSA) Screening

Swabs taken from the nose, groin, wounds or skin lesions and catheter urines are suitable for screening for *Staphylococcus aureus*. If normal request forms are used, please state 'MRSA SCREEN' or *Staph aureus* screening (MSSA) **NOT** 'MCS as the investigation required. If ICE request please use one ICE request per sample. Place all specimens from one patient in a single bag with one screening form. If the patient has had MRSA previously please state in the clinical details.

MSSA (methicillin susceptible S. aureus) screening swabs are taken from the nose, groin/perineum, wounds or skin lesions and catheter urines are suitable for screening. MSSA and MRSA swabs are NOT required as the MSSA screening will pick up MRSA

MSSA screening is for pre-operative cardiac patients, renal, spinal, or burns patients so please state this in the clinical details.
Refer to the Trust's Infection Control Policies.

Other screening swabs

- MRC (Multi resistant Coliforms) – Swabs taken from the nose, groin, wounds or skin lesions and catheter urines are suitable for screening.
- CPE (Carbapenemase producing Enterobacteriales) – Rectal swabs ONLY, and with visible faecal material.
- Pseudomonas screening (NICU) - Swabs taken from the nose, groin, wounds or skin lesions and catheter urines are suitable for screening.

If sending a paper request please state organism screen required on the form

Non-MRSA screening swabs

Swabs may be taken to screen for a variety of organisms e.g. *Acinetobacter*, *Enterobacter*, *pseudomonas* etc. in addition to MRSA and MSSA. If ordering in ICE select the Non-MRSA option and pick the organism you are screening for from the drop down menu. If the organism is not listed then please include the name of the organism you are screening for in the clinical details. If sending a paper request please state organism screen required on the form.

Pernasal Swabs for *Bordetella pertussis*

Pernasal swabs are the most reliable way of making the diagnosis of whooping cough. Special ENT transwabs are available from Pathology consumables dept.

Pertussis serology is usually more useful in adults presenting with a prolonged cough. PCR on pernasal swabs or nasopharyngeal aspirates is now also available for the diagnosis of *B. pertussis* infection.

Sputum

Sputum is of little value in the diagnosis of lower respiratory tract infection (with the exception of TB) - see bronchoalveolar lavage. The aim is to collect deep respiratory secretions without contamination by upper respiratory tract bacteria. If sent, purulent sputum, not saliva, is required (saliva will be discarded by the laboratory). Specimens which macroscopically prove to be largely saliva or mucoid specimens yield no useful information and will not be cultured. Do not collect shortly after the patient has been drinking, eating or cleaning the teeth. Specimens should be taken wherever possible before antibiotic therapy is given as specimens obtained after antibiotic therapy has been initiated are of little value and may even yield misleading results. They should not therefore be submitted for microbiological examination.

If tuberculosis is suspected, send three specimens of early morning sputum taken on different days. Please discuss with a Medical Microbiologist if urgent or TB suspected.

For patients suspected of having community-acquired pneumonia blood cultures are essential.
Please send separate sample and form to Cytology if cytology is requested.

Throat Swabs

Distinguishing between viral and streptococcal pharyngitis on clinical grounds is frequently impossible and correct diagnosis depends on the culture of appropriate throat swabs for bacteriology and/or

virology. Sampling errors in swabbing the throat are frequent. The best results are obtained from specimens taken by vigorous rather than gentle application of the swab to the posterior portion of the pharynx, tonsillar areas and areas of ulceration, exudation or membrane formation. Routine bacterial culture will exclude β–haemolytic streptococci only.

If the patient has recurrent or persistent pharyngitis/ sore throat or is admitted to hospital with a severe sore throat, this must be stated on the request form to ensure that culture for *Fusobacterium necrophorum* is included.

Please inform laboratory if diphtheria is clinically suspected or appropriate culture may not be undertaken. In addition, inform a medical microbiologist and report to the Consultant for Communicable Disease Control (CCDC).

Tips / cannulae

Urinary catheter tips are unsuitable for the diagnosis of UTI and are not processed. An MSU should be submitted for the diagnosis of UTI.

Intravenous catheter tips are not suitable for the diagnosis of bacteraemia. Tips will not normally be processed unless evidence of clinical infection (systemic infection or localised line site infection) is indicated in the clinical details. Peripheral and line blood cultures taken at the same time are the specimens of choice to diagnose line associated bacteraemia.

Epidural tips should only be sent if there is clinical evidence of infection.

Line-related infections

Do not send intravascular line tips on removal of the line if there are no clinical reasons to suspect that the patient is septic. For suspected line-related infections, send two sets of blood cultures, one from the line itself and one from a peripheral vein, as well as the tip. If line has been used for Total Parenteral Nutrition this should be noted on request form.

Tissues and Biopsies

Specimens received in formalin are unsuitable for bacterial culture.
Large specimens should be sent in a plain, leakproof, screw capped container and transported to the laboratory as soon as possible. Smaller specimens, or those where a delay in transportation to the laboratory is likely, should be placed in a similar container and covered with sterile normal saline to prevent desiccation.

Biopsies for the culture of *Helicobacter pylori* are referred to the PHE Colindale laboratory and users should contact them directly to arrange for specific culture medium to be sent which is then sent to the laboratory for referral.

More than one tissue/fluid specimen is required for the exclusion of infection in orthopaedic surgery undertaken for revision of prostheses. Ideally, up to 5 specimens should be taken from different areas using a sterile set of instruments for each specimen, and sent for culture.

Urine

Diagnosis of UTI

Before sending to the laboratory urines should be screened in the clinical setting using dipsticks that are able to detect both leucocyte esterase and nitrites. This will give an almost immediate indication as to whether UTI is likely and for the need to culture in all but a few patient groups. Please follow the urinalysis algorithm before submitting any samples to the laboratory. There is a strict rejection policy in place for urine samples that are submitted without the relevant information or screening.
Urine catheter tips will not be processed. There is no such thing as a routine MSU or CSU. Specimens should be sent only on clinical grounds. Sensitivities on isolates from CSUs will be withheld unless there is clinical information to suggest that the patient is actively infected, i.e. pyrexia, septicaemia, etc. If the specimen cannot be sent immediately to the laboratory, refrigerate until transport is available. In the absence of pyuria, investigations to exclude TB will not usually be undertaken. Early Morning Urine (EMU) collection kits for TB are supplied by Pathology consumables on request.

Clean-voided midstream urine is preferred for bacterial and fungal cultures. Transport the sample to the laboratory within 4-6 hours is essential unless the specimen can be adequately refrigerated e.g. overnight. The reliability of culture results depends on the avoidance of contamination and prompt transport. It is recommended, where practicable, that in females the perineal area is cleansed with soap and water prior to collection of the specimen. The patient must be told not to collect the first part of the urine to avoid contamination with urethral organisms. In males, retraction of the foreskin is adequate and prior cleansing is not required

Without stopping the stream the specimen is collected in a sterile or clinically clean utensil i.e. foil bowl or specimen container by intercepting the stream. If the specimen is collected in a foil bowl and greater than 2ml transfer to an analyser ready boric acid urine container. If less than 2ml please use a white top universal container. If a white top universal container is used please ensure that the clinical details state only a small volume of urine could be obtained. If there is likely to be a delay in collection the specimen should be refrigerated (not in the food or drugs refrigerator)

Catheter specimens of urine (CSU) should only be sent if the patient is systemically unwell or about to undergo urinary instrumentation or surgery and then should be obtained aseptically with a sterile syringe and needle following disinfection of the catheter specimen port with an isopropyl alcohol. Long-term urinary catheters are invariably colonised with one or more microorganisms.

Try to collect the specimen within 1 hr of specimen transport to the laboratory. The specimen should not be collected from the drainage bag, only from the sampling port. Clamp off the drainage tube immediately below the sampling port and leave for several minutes to allow enough urine to collect for sampling. Using a needle and syringe insert the needle through the latex or plastic port and withdraw 7ml of urine. Transfer the urine to a sterile container containing boric acid. If the specimen is not to be transported within one hour it must be refrigerated.

Clean-catch urine thorough peri-urethral cleaning is recommended; the whole sample collected in a sterile container and greater than 2ml transfer to a sterile urine container containing boric acid. If less than 2ml please use a white top container.

Bag Urine (BAG) Commonly used for infants and young children. A sterile bag is taped over the genitalia and the urine collected. Frequent problems of contamination are encountered with this

method. The whole sample should be collected into a sterile container and greater than 2ml transfer to a sterile urine container containing boric acid. If less than 2ml please use a white top container.

Ileal conduit – urostomy urine – nephrostomy catheters Urine obtained via a catheter passed aseptically into the stoma opening after removal of the external appliance. Results are difficult to interpret. If greater than 2ml transfer to a sterile urine container containing boric acid. If less than 2ml please use a white top container.

Supra-pubic aspirate (SPA) Urine obtained from the bladder by aseptic aspiration with a needle and syringe. If greater than 2ml transfer to a sterile urine container containing boric acid. If less than 2ml please use a white top container. Please ensure that the sample is clearly marked as a supra-pubic aspirate, in order to avoid confusion with samples collected from supra-pubic catheters.

Cystoscope urine (CU) Urine obtained via a cystoscope either from the bladder or from individual ureters. If greater than 2ml transfer to a sterile urine container containing boric acid. If less than 2ml please use a white top container.

Stamey Test Samples collected for diagnosis of prostatitis

- The initial 5-8ml voided urine (urethral urine)
- MSU (bladder urine)
- Expressed prostatic secretions following prostatic massage
- First 2-3ml voided urine following prostatic massage

Pad Urines Urine expressed from a sterile 'nappy' pad into a plain urine universal. If greater than 2ml transfer to a sterile urine container containing boric acid. If less than 2ml please use a white top container.

Diagnosis of mycobacterial infection

Urine specimens will be cultured for mycobacteria only if:

1. Request form includes relevant clinical details e.g., renal tuberculosis, miliary tuberculosis, proven sterile pyuria etc.
2. Clinical details indicate that the patient is immunocompromised
3. By prior arrangement with the medical staff in bacteriology

Specimens that do not fulfil any of these criteria will not be processed.

Send 3 **entire** early morning urine (EMU) (when urine is most concentrated) taken on 3 consecutive days. Large volume EMU containers are available on request from the laboratory.
Boric acid containers should not be used for the investigation of mycobacterial infection

Diagnosis of Schistosomiasis (Bilharzia)

3 complete urine specimens for the investigation of schistosomiasis should be taken between 10:00h – 14:00h. In patients with haematuria, 3 terminal urine specimens may be adequate for diagnosis, taken over a 24 hour period.

Detection of urinary legionella antigen or pneumococcal urinary antigen

Send plain urine specimen for testing.

Wound and Pus Swabs

Always state the site and nature of the wound on the request form. This is essential for correct laboratory processing and interpretation of laboratory results.

Pus, if present, is the specimen of choice and should always be sent if available in preference to a swab. Aspirate any material with a sterile needle and syringe and transfer to a clean, leakproof, screw capped universal container. Do not send to the laboratory in the syringe and needle as this is hazardous to staff handling the specimen. If it is necessary to send the syringe then carefully remove the needle and cap the syringe. It is unnecessary to send routine specimens from the same site on consecutive days unless there is clinical deterioration

Wound swabs should only be taken if there is clinical evidence of infection, unless there is an infection control reason. A wound swab should be obtained after the wound is cleaned, but before antibiotics commenced or changed, and it should be taken directly from an infected site avoiding contaminating undamaged skin or mucous membranes. Rotate the swab in pus or exudate and place it in the transport media.

Venous Ulcer swabs

Superficial swabs taken from ulcers are not generally helpful as the organisms isolated may represent superficial colonisation only. The guidelines issued by the Royal College of Nursing[2] state that "Routine bacteriological swabbing is unnecessary unless there is evidence of clinical infection such as inflammation / redness / cellulitis, increased pain, purulent exudates, rapid deterioration of the ulcer, pyrexia".

Swabs submitted from venous ulcers will not be processed unless relevant clinical details and symptoms as stated above are given on the request form.

Swabs from tropical ulcers should be submitted with relevant clinical information including details of recent foreign travel.

Leg ulcers Do not send swabs unless there is evidence of infection, even if the ulcer if failing to heal. Take the swab from beneath the margin of the ulcer; a foul odour is consistent with the presence of anaerobes. Ensure the swab and request form are labelled as the specimen policy

Ear Swabs Please specify whether the specimen is obtained from a patient with otitis externa or media. A swab of the infected area, obtained before antibiotics are initiated, should be sent to the laboratory in transport medium.

Collection of Peritoneal Dialysis Fluids (Cloudy fluids or those suspected of infection)

Disinfect with an alcohol wipe the portion of the dialysis bag or port from which the fluid is to be taken and allow to dry. Collect at least 30ml of fluid through the disinfected area using a sterile needle and syringe and then place in a sterile container. Place in the plastic transport bag. If the specimen is likely to be delayed before being sent to the laboratory it may be refrigerated at 4ºC but this is best avoided.

Collection of Cerebrospinal fluid (CSF) and operative specimens

Some specimens are collected by invasive procedures, for example lumbar puncture, bone marrow aspirate, bronchoscopy, or at operation under general anaesthesia. Such specimens tend to be non-repeatable and from normally sterile sites, hence results of culture or microscopy are of special importance. It is the requesting doctor's responsibility to arrange for rapid transport of such

specimens to the laboratory and provide notification of their arrival in-hours or out-of-hours to the on-call BMS if the specimen is urgent.

CSF must be collected by means of strict aseptic technique in order to minimise specimen contamination. The volume of CSF obtained will limit the number of investigations available. Indicate, first, second, third and fourth specimens where applicable. Indicate if the sample is taken from an EVD, shunt, etc.

Serial red blood cells counts are unnecessary to confirm a diagnosis of subarachnoid haemorrhage and will NOT be carried out. Do not request 'culture' unless meningitis is suspected. Requests for PCR must be authorised by the Consultant-In-Charge of the patient.

The results of microscopy are available on the computer as soon as they are available. Positive culture results are communicated to the patient's doctor by a medical microbiologist.

Mycology

Collection of specimens for mycology

Clinical information MUST include contact with animals, occupation and recent travel abroad.

Skin

Specimens from skin lesions should be collected by scraping skin from the advancing edge of the lesion with a blunt scalpel blade or other sharp instrument. Place the scraping into a special Mycology transport pack (MycoTrans or other commercial equivalent). Please make sure you send enough material for both microscopy and culture. At least 5mm^2 of skin flakes are required. NB swabs are of little value for the investigation of dermatophyte infections

Nails

Clippings should include the full thickness of the nail and extend as far back from the edge as possible. Samples should be sent in a Mycology transport pack. Several small parings are preferred to one large sample in order to optimise culture results. Nail parings should be taken from the diseased area, the discoloured or brittle parts of the nail and cut back as far as possible from the free edge as some fungi are restricted to the lower parts. Scrapings can also be taken from under the nail to supplement the clipping. Nail clippings often fail to grow fungi even if present.

Hair

Hair should be plucked from affected areas together with skin scrapings from associated scalp lesions. Broken lustreless hair should be selected from the margin of the scalp lesion. Hair should be removed with epilating forceps. The hair follicle and one inch of proximal hair should be sent to the laboratory in the commercial kit available form pathology. Receipt of cut distal ends will not be processed.

VIROLOGY

INTRODUCTION

Developments in diagnostic virology now allow the clinician the opportunity to make a rapid identification of the cause of many common viral illnesses. This is critical for the appropriate and timely use of anti-viral agents, and the application of infection control measures. Furthermore, the positive identification of a viral illness may protect patients from needless exposure to antibiotics.

This section lists the tests performed locally, as well as commonly requested tests referred to other laboratories, with brief notes on clinical uses and appropriate specimen types. There are two main sections: **serology** and **molecular diagnostics**. General guidance only is given for each section.

Please note that turn-around times are influenced by the frequency of testing and the need for further/ confirmatory tests, as well as the transport arrangements between the laboratory and the requesting hospital or practice. If bacteriology and/or mycology tests are required on the same sample, please ensure that sufficient specimen has been taken, and divide appropriately if possible.

It is essential to include full clinical details on request forms, in addition to the usual patient details. These details include the date of onset, nature of symptoms, occupation, exposure to infected individuals, the gestational age if pregnant and any relevant travel details and immunisation history. Interpretative comments may not be able to be added without the clinical context.

MICROBIAL SEROLOGY

General guidance

During the acute phase of viral infection, specimens for virus nucleic acid detection (swabs, NPA, BAL, faeces, fluids, EDTA blood) should be sent whenever possible, since a detectable serological response may not have occurred.

In some cases, acute and convalescent blood samples are required to allow a clear interpretation. Typically, a convalescent blood refers to one taken at least 10 days after the onset of the illness. Paired acute and convalescent samples should be separated by at least 7 days. Six (6) mLs of clotted blood (plain tube/ no additive/serum separation) is sufficient for most serology test combinations. Where a test request profile includes both local and referred tests, additional volume is often required. Electronic test ordering of tests aids in assisting correct sample volumes for the number of tests.

Clinical details are essential to obtain the correct interpretative comment, and to allow additional relevant testing.

Whereas the presence of IgM and IgA antibody is usually a marker of acute or recent infection, IgG antibody may represent past infection. IgG antibody against common infecting agents (e.g. CMV, EBV, VZV) may also be acquired from transfused blood or blood products, or across the placenta. Such passively acquired IgG may remain detectable for several months. Similarly, the persistence of IgM is highly variable (range from one month in some cases to over one year in others e.g. treponema, CMV and toxoplasma), potentially making clear interpretation of results difficult. Certain IgM assays may show cross-reactivity (e.g. CMV and EBV; parvovirus B19 and rubella) in these cases the clinical and epidemiological data together with IgG seroconversion or IgG avidity may help to clarify the result. Occasionally it may not be possible to distinguish true reactivity from a non-specific cross-reactivity.

Acute Epstein-Barr virus infection may lead to polyclonal stimulation of B lymphocytes and the production of IgM against distant past infections. EBV serology is done on selected IgM positive results (for example, CMV) to investigate this possibility.

Nucleic acid detection may be helpful where the IgM results are difficult to interpret, for example, distinguishing between recent EBV, CMV, and parvovirus B19 infection.

MOLECULAR DIAGNOSTICS (NAAT)

Detection of viral nucleic acid offers high sensitivity and specificity. It is essential that specimens are taken in as sterile a procedure as possible and not exposed to contamination by the outside of the container. When possible, send a separate specimen to Virology, to reduce the risk of contamination (and, in the case of CSF, retain the integrity of the cellular components). Specific swabs with transport medium suitable for molecular tests are supplied by the laboratory; please contact the laboratory if you are unsure about the appropriate swab kit. Do NOT send swabs in bacteriology medium as they are suboptimal.

When requesting NAAT testing of certain non-blood specimen types it can be important to determine whether viraemia is also present in order to evaluate the significance of the result. Examples include testing bronchoalveolar lavage fluid for CMV and HSV, vitreous fluid for herpesviruses, and CSF specimens sent from neonates and the immunocompromised. In these settings please send a contemporaneous EDTA blood for the relevant test; please contact the laboratory if there is any doubt over which specimen types to send.

The nature of most molecular diagnostic techniques currently precludes them as part of the on-call service, and they are performed regularly throughout core hours or according to a defined laboratory timetable as batches of specimens. The need for immediate antiviral therapy in some illnesses (e.g. suspected HSV encephalitis) means that initiation of treatment is still required whilst awaiting a result. Please discuss any such cases with an infection specialist if in doubt.

NAAT tests are available for the following:

- Respiratory viruses (Influenza A and B, respiratory syncytial virus, human metapneumovirus, adenovirus, parainfluenza 1,2,3,4, rhinovirus)
    - Suitable respiratory tract sample types are nose (and pernasal) swabs, throat swabs, nasopharyngeal aspirates, sputum, bronchoalveolar lavage, ET secretions.
- SARS-CoV-2
    - Suitable respiratory tract sample types are nose and throat swabs, nasopharyngeal aspirates
    - For further information please see specific laboratory user manual for this service by following the link below: https://www.nbt.nhs.uk/severn-pathology/pathology-services/infection-sciences-microbiology-virology
- Adenovirus
    - Blood (quantitative , immunocompromised patients), Respiratory secretions, eye swabs, CSF (qualitative)
- BK virus (quantitative)
    - Blood, urine (immunocompromised)
- CMV

  - Blood, amniotic fluid, CSF, urine, eye fluid (quantitative) Bronchoalveolar lavage, sputum (qualitative),
- Enterovirus (qualitative)
  - CSF, blood, faeces, eye swab, throat swab
- EBV (quantitative)
  - CSF, blood, eye fluid
- Gastroenteritis viruses- Norovirus, adenovirus, rotavirus, astrovirus and sapovirus
  - Faeces, vomit
- Hepatitis B (quantitative)- blood
- Hepatitis C (qualitative and quantitative, optional genotyping)
  - Blood
- HSV 1 and 2 (qualitative)
  - Lesion swabs, CSF, blood, vesicle fluid, bronchoalveolar lavage, sputum, eye swabs, eye fluid
- HHV6
  - CSF (qualitative)
  - Blood (quantitative)
- HIV quantitative (viral load)
  - Blood, CSF (rarely)
- Parvovirus (quantitative)
  - Blood, amniotic fluid
- VZV (qualitative)
  - Lesion swab, vesicle fluid, CSF, blood, eye fluid
- Measles (qualitative)
  - oral fluids.
  - throat (mouth) swabs.
  - blood samples.
  - sera.
  - urine.
  - nasopharyngeal aspirates.
- Bordetella sp (qualitative)
  - nasopharyngeal swabs

Please contact the laboratory to discuss the availability of tests not listed above, or if clarification is needed on the appropriateness of the test, or the relevant specimen type.

Please also note that not all specimen types as listed are available as accredited procedures. For information relating to laboratory scope of accreditation please follow link below;

https://www.ukas.com/wp-content/uploads/schedule_uploads/00007/8099%20Medical%20Single.pdf

https://www.ukas.com/wp-content/uploads/schedule_uploads/00007/8043%20Medical%20Multiple.pdf

SCREENING TESTS

The laboratory provides a service for non-diagnostic tests such as;

Infertility screening;

- Males – Hepatitis B (including HBcAb and HBsAg), Hepatitis C, Syphilis and HIV serology.

- Females - Hepatitis B (including HBcAb and HBsAg), Hepatitis C, Syphilis and HIV, Chlamydia trachomatis and Rubella serology (Immunity)

Antenatal screening

- Hepatitis B, HIV and Syphilis serology.
- Please note Rubella Immunity is not routinely available as part of the routine antenatal booking screen in accordance with the IDPS guidance. Please indicate clearly stating reason if Rubella Immunity is required on the request.

NOTIFICATION OF INFECTIOUS DISEASES

It is the statutory duty of the clinician responsible for a patient suffering from a notifiable diseases. Guidance for this is available:

https://www.gov.uk/government/collections/notifications-of-infectious-diseases-noids

Urgent cases should be telephoned in order to allow that health protection teams to implement any action required in the community as rapidly as possible, such as contact tracing, prophylaxis, and quarantining. Telephone contact should be followed by written notification.

Control of infection

Infection Control advice is provided at each Trust site by the Director of Infection Prevention and Control (DIPC), Consultant Medical Microbiologists and the Infection Control Nurses. Contact details for these are available via switchboard.

Departmental Guidelines

The department has compiled many documents giving advice either on specific subjects or for specific users. These are available on the NBT, UHBristol and RUH intranet sites as well as the PHE National website at www.phe.gov.uk

References

1 Preventing person-to-person spread following gastrointestinal infections: guidelines for public health physicians and environmental health officers. Working group former PHLS Advisory Committee on Gastrointestinal Infections; CDPH, Vol 7; No. 4 December 2004

2 Clinical practice guidelines for the management of patients with venous leg ulcers. Royal College of nursing, centre for evidence-Based Nursing and Department of Nursing. 1998, University of Liverpool

Appendix 1 - DEPARTMENTAL TELEPHONE NUMBERS

NBT Site

Laboratory Management

Post	Individual	Telephone	Email
Infection Sciences Service Manager (Interim)	Mr Richard Hopes	0117 414 6276	Rich.Hopes@nbt.nhs.uk
PHE Head of Operations (Interim)	Mr Jonathan Steer	0117 414 6267	Jonathan.steer@phe.gov.uk
Assistant Infection Sciences Services Manager and Head of Bacteriology	Ms Nicola Childs	0117 414 6218	Nicola.childs@nbt.nhs.uk
Head of the Antimicrobial Reference Laboratory	Mr Alan Noel	0117 414 6295	Alan.Noel@nbt.nhs.uk
Virology Laboratory Manager (Interim)	Mrs Lynette Parfitt	0117 414 6205	Lynette.Parfitt@nbt.nhs.uk
Mycology Reference laboratory Manager	Mr Mike Palmer	0117 414 6246	Michael.Palmer@nbt.nhs.uk
Quality Manager	Mrs Elisabeth North	0117 414 6265 07810630240	Elisabeth.North@nbt.nhs.uk
Laboratory Safety Officer	Mrs Carolyn Pugh	0117 414 6243	Carolyn.Pugh@phe.gov.uk
IT Manager	Mr Dave Wright	0117 414 6240	David.Wright@phe.gov.uk

Medical/Clinical Scientist staff

Post	Individual	Telephone	Email
Microbiology Clinical enquiries		0117 414 6222	
Infection Sciences – Clinical Lead	Prof Alasdair MacGowan	0117 414 6216	Alasdair.MacGowan@nbt.nhs.uk
Consultant Medical Microbiologist	Dr Isabel Baker		Isabel.Baker@nbt.nhs.uk
Consultant Medical Microbiologist	Dr Mahableshwar Albur,	0117 414 6230	Mahableshwar.Albur@nbt.nhs.uk
Consultant Medical Microbiologist	Dr Elisabeth Darley	0117 414 6221	Elizabeth.Darley@nbt.nhs.uk
Secretaries to Prof A MacGowan		0117 414 6215/6273	Josephine.poad@nbt.nhs.uk Joanne.cook@nbt.nhs.uk
Secretary to Dr Darley		0117 414 6231	
Specialist Registrars:		0117 414 6214	
Consultant Clinical Virologist –Head of Virology	Dr Matthew Donati	0117414 6256	Matthew.Donati@nbt.nhs.uk Matthew.Doanti@phe.gov.uk
Consultant Clinical Scientist (Virology)	Dr Peter Muir	0117 414 6236	Peter.Muir@nbt.nhs.uk Peter.Muir@phe.gov.uk
Consultant Clinical Virologist	Dr Sophie Gillett	0117 414 6237	Sophie.Gillett@nbt.nhs.uk

Consultant Clinical Virologist	Dr Charles Irish	0117 414 6247	Charles.Irish@phe.gov.uk
Clinical Scientist (Head of Virology Molecular R&D)	Dr Barry Vipond	0117 414 6263	Ian.Vipond@phe.gov.uk
Clinical Scientist	Dr Jiancheng Zhan	0117 414 6229	JianCheng.Zhang@nbt.nhs.uk
Consultant Clinical Scientist (Mycology)/Head of Mycology reference laboratory	Dr Elizabeth Johnson,	0117 4146= 6284	Elizabeth.johnson@nbt.nhs.uk
Clinical Scientist (Head of the Antimicrobial Reference Laboratory	Mr Alan Noel	0117 414 6295 07802 720 900	Alan.Noel@nbt.nhs.uk

BRI Site

Post	Individual	Telephone	Email
Consultant Medical Microbiologist/Head of Bacteriology	Dr Martin Williams,	0117 342 9265	Martinx.Williams@UHBW.nhs.uk
Consultant Medical Microbiologist	Dr Rajeka Lazarus	0117 3429266/9267	Rajeka.Lazarus@UHBW.nhs.uk
Consultant Medical Microbiologist	Dr Phil Williams	0117 3429266/9267	Philip.williams2@UHBW.nhs.uk
Consultant Medical Microbiologist	Dr Irasha Hettiarachchi	0117 3429266/9267	Irasha.Hettiarachchi@UHBW.nhs.uk
Specialist Registrars		0117 342 9269/9270	

Scientific and Technical Staff

The department employs a range of scientific and technical staff (Clinical Scientists, Biomedical Scientists, Medical Laboratory Assistants) as well as admin and clerical support staff.

All of our professional staff registered with national bodies, such as the British Medical Association or the HCPC and are regularly assessed both internally / externally further ensuring and continually improving the quality of our service that we offer to all our users.

Post	Individual	Telephone
Bacteriology	Late shift BMS (in use 17:00hrs pm – 20:00hrs)	Radiopage via switchboard
Virology		Requests made through consultant clinical virologist via switchboard

General Enquiries and Laboratory Administration

Location (Site/Department)	Details/Individual	Telephone	Email
Laboratory Administrator (PHE)	Helen Thresher	0117 414 6266	Helen.thresher@nbt.nhs.uk Helen.Thresher@phe.gov.uk
Departmental Secretary (BRI site)	Angela Pollard	0117 342 9268	Angela.Pollard@uhbristol.nhs.uk

Appendix 2 – Test/Procedure/Analyte

- **Bacteriology**

Investigation	Department	Acceptable sample type	Sample container details	Test	Turnaround time	Special instructions
LRTI investigations	Bacteriology	Bronchoalveolar lavage, Sputum and associated specimens	Universal (white top)	Routine culture and sensitivities	12 days	Do not send specimens obtained after antibiotic therapy has been initiated or specimens which are largely salivary. Please request TB or fungal culture if required. Please request TB culture, PCP, or virology if required.
LRTI investigations	Virology*	Bronchoalveolar lavage and associated specimens	Universal (white top)	Molecular assay	2 days	
Respiratory viruses	Virology*	Nose and Throat swabs, Throat gargles, Nasopharyngeal aspirates, Sputum, Bronchoalveolar lavage	Flocked swabs in viral transport medium Universal (white top)	Molecular assay	2 days	Tests include - Influenza A and B, RSV, human metapneumovirus, adenovirus, parainfluenza viruses 1,2,3,4 Rhinovirus
Respiratory CF	Bacteriology				5 days	
Tracheal aspirate for MC&S	Bacteriology	Tracheal aspirate	Universal (white top)	Routine culture and sensitivities	4 days	Please request TB culture if required.
Pneumocystis jirovecii	Virology	Bronchoalveolar lavage/washings and sputum	Universal (white top)	Direct immunofluorescence	2 days	BAL samples are processed by IF for *Pneumocystis jirovecii.* Molecular testing is preferred for respiratory viruses. Samples may be tested by PCR for CMV and HSV if requested
TB	Bacteriology	Sputum/ Pus/ Tissue NOT Swabs	Universal (white top)		70 days	
Blood culture for *Mycobacterium sp*	Bacteriology		TB blood culture bottle		70 days	Please request kit from the laboratory. Positive culture is likely to be <14 days
Blood cultures	Bacteriology		Blood culture bottle set		6 days	2 sets of cultures at separate times from separate sites should be obtained (other than for line infection or endocarditis). 1 ICE request will generate 2 labels - please place 2 requests if you are sending more than 1 set.
Fluids for MC&S	Bacteriology		Universal (white top)		6 days	Microscopy for crystals performed by Cytology - please send a separate request. Please request TB culture if required.

Peritoneal Dialysis fluid for MC&S	Bacteriology		Universal (white top)		6 days	
CSF	Bacteriology		Universal (white top)	Microscopy	4 hours	Assay available on call Do not request culture unless meningitis suspected. It is the requesting doctor's responsibility to arrange for transport and provide notification to the laboratory of urgent specimens. Please request TB culture or virology if required. It is essential that sufficient specimen is sent for all the tests required. This is particularly important if tuberculous infection is suspected where small numbers of organisms may be present. If sub-arachnoid haemorrhage is suspected, send three sequentially labelled specimens (clearly labelled 1, 2 and 3) so that differential red cell counts may be performed. The presence of xanthochromia cannot be determined reliably by macroscopic appearance so is not reported in microbiology. Spectrophotometric analysis for xanthochromia is available from Chemical Pathology.
CSF	Bacteriology		Universal (white top)	Bacterial Culture	4 days	
CSF	Virology*		Universal (white top)	In house Molecular assay	3 days	
Tissues & Biopsies	Bacteriology		Universal (white top)		10 days	Do not send large tissue specimens - only send sections believed to be infected. It is the requesting doctor's responsibility to arrange for transport and provide notification to the laboratory of urgent specimens. Please request TB culture if required.
Pus for MC&S	Bacteriology		Universal (white top)	Routine culture and sensitivities	8 days	Please request TB culture if required, with relevant clinical details.
Abscess	Bacteriology	Send pus in a clean leak-proof screw capped universal container or if material is limited, a swab in BTM.				Always send pus if possible. Theatre specimens taken outside of normal laboratory hours may need to be examined promptly – contact the BMS on-call via switchboard
Tips for MC&S	Bacteriology		Universal (white top)	Routine culture and sensitivities	4 days	Do not send intravascular line tips if there is no reason to suspect infection. For suspected line-related infections, send two sets of blood cultures, one from the line and one from a peripheral vein, as well as the tip. Urinary catheter tips will not be processed.

Eye swabs	Bacteriology		Amies Sigma Transwab (MW176S)	Routine culture and sensitivities	4 days	Conjunctival swabs should be sent for the diagnosis of superficial infections. Sigma Transwab (MW176S transwabs should be used for bacterial culture and plain swabs in special transport medium for chlamydia. A special chlamydia slide may also be sent for immunofluorescence. Conjunctiva swabs should be collected in transport medium. Swabs for chlamydia investigations are available from the Laboratory. Ensure the swab and request form are labelled as the specimen policy
Eye swabs	Virology*		Flocked swab in viral transport medium	PCR (In house - HSV, Adenovirus)	3 days	
Corneal Scrapes	Bacteriology			Microscopy	Same day	Corneal ulcer kits are available from the laboratory and a stock is held in the casualty department of the Bristol Eye Hospital and the Royal United Hospital in Bath. These consist of a glass bijou containing 0.5ml of transport broth for bacteriological analysis inside a plastic 60ml container, plus 2 marked slides. Please ensure that these kits are in date and the broth not desiccated before use.
Corneal Scrapes	Bacteriology			Culture	10 days	The ulcer should be scraped using a sterile scalpel blade and the blade dropped into the bijou of broth. A second scrape should be used to inoculate both of the glass slides within the marked area for virology (immunofluorescence) and bacteriology (microscopy). **Ensure that the slides are labelled in pencil with the patient name on the same side as the smear.** **The laboratory should be notified by phone in advance of all scrapes taken** **Deep or operative eye specimens** should be sent directly to the laboratory for urgent processing. Delays can compromise results. There is an agreement with BEH regarding specimen volume and the need to clearly label test priority, so that vitreous fluid is not wasted doing unnecessary tests]
Culture for Acanthamoeba	Bacteriology				Up to 5 days	If culture for acanthamoeba is required this must be indicated specifically on the request as specialist media has to be freshly prepared.
Ear Swabs	Bacteriology		Sigma Transwab (MW176S)	Routine culture and sensitivities	4 days	
Nose Swab	Bacteriology		Sigma Transwab (MW176S)	Routine culture and sensitivities	4 days	Use Infection Screen request for MRSA, SA (Renal), MRC, or VRE screen.
Skin & Superficial site Swabs	Bacteriology	Skin swab - state site	Sigma Transwab (MW176S)	Routine culture and sensitivities	4 days	Use for MCS on superficial sites. For deeper sites please use Wound for MCS.

Mouth swabs	Bacteriology		Sigma Transwab (MW176S)	Routine culture and sensitivities	4 days	
Throat swabs	Bacteriology		Sigma Transwab (MW176S)	Routine culture and sensitivities	4 days	
Pernasal swab	Bacteriology		Sigma ENT Transwab	Routine culture and sensitivities	8 days	Regular Sigma Transwabs of "Nose" are not suitable.
Wound swab	Bacteriology		Sigma Transwab (MW176S)	Routine culture and sensitivities	4 days	
Faecal culture (MC&S)	Bacteriology		Blue top universal with spoon	Routine culture and sensitivities	4 days	All diagnostic specimens are cultured routinely for the following: *Salmonella sp, Shigella sp,* campylobacter and *E.coli 0157*. In addition, children under 10yrs old with diarrhoea will have culture for *Yersinia enterocolitica* performed. (LTT 2 – 4 days). Please indicate duration of symptoms, any history of foreign travel, use of antibiotics, suspected food poisoning, type of food, and whether diarrhoea is community- or hospital-acquired. Faeces will only be cultured for Vibrio cholerae in patients where there is a relevant travel history. Clearance specimens from patients previously positive with non-typhoidal salmonella, S. sonnei and campylobacter are not required unless there is a recurrence of new symptoms. The CCDC will advise where clearance specimens are indicated (e.g. S,typhi, S. paratyphi, S. dysenteriae, S. flexneri, S. boydii, V. cholerae and E.coli 0157)
Clostridium Difficile	Bacteriology	Faecal samples	Blue top universal with spoon	Enzyme immunoassay	24 hours	Specimens from inpatients who develop diarrhoea with no clearly attributable underlying condition (e.g. inflammatory colitis, overflow) or therapy (e.g. laxatives, enteral feeding) should be submitted for testing and will have Clostridium difficile tests performed. Formed stool specimens will not be processed. The sample must take on the shape of the 'universal' container and be at least ¼ filled.
Gastrointestinal parasites	Bacteriology	Faecal samples	Blue top universal with spoon	Enzyme immunoassay - Cryptosporidium and Giardia only	4 days	Please provide full travel history including dates Routine screening for *Cryptosporidium sp i*s undertaken on all specimens from suspected outbreaks and on diagnostic specimens from immunocompromised patients and those aged <45 years. There is no need to request this as a separate OC&P investigation

						For patients with relevant travel or clinical history at least 3 specimens of faeces, passed at different times, should be sent for parasitology giving relevant clinical details.
Gastrointestinal parasites	Bacteriology	Faecal samples	Blue top universal with spoon Faeces/ Urine	Microscopy	4 days	Full OCP will only be performed on patients with relevant clinical details. 3 consecutive samples should be obtained. Send a "grape-sized portion" (5 to 10 ml if liquid), of faeces in a sterile container. Other specimens are of little value for the isolation of faecal pathogens. Do not send more than one specimen from the same patient on the same day.
Helicobacter pylori faecal antigen	Bacteriology	Faecal sample	Blue top universal with spoon	EIA	3 days	Samples will be rejected if they have been taken more than 72hours prior to receipt/ Minimum volume: 2 spatula-sized portions. Antimicrobials, proton pump inhibitors and bismuth preparations are known to suppress H.pylori and ingestion of these prior to H.pylori testing (antigen detection) may give a false negative result. If a negative result is obtained for a patient ingesting these compounds within two weeks prior to performing the Premier Platinum HpSA PLUS test, it may be a false-negative result and the test should be repeated on a new specimen obtained two weeks after discontinuing treatment.
Gastroenteritis viruses- adenovirus, rotavirus, astrovirus and sapovirus	Virology*	Faecal sample	Blue top universal with spoon	PCR (In house)	2 days	
Gastroviruses - Norovirus	Virology*	Faeces and Vomit	Faeces - Blue top universal with spoon Vomit - Universal (white top)	PCR (In house)	2 days	
Genital Swabs	Bacteriology	HVS/ LVS/ Cervical/ Endocervical/ Vaginal	Sigma Transwab (MW176S)	Routine culture and sensitivities	4 days	For diagnosis of candidiasis, Trichomonas vaginalis, and bacterial infection (including gonorrhoea). Cervical/ endocervical swabs should be taken for STI investigations. Samples submitted for testing should be sent asap to the laboratory to preserve viability of the organism.
C.trachomatis Detection	Virology	Urine, Urethral swab, Vaginal swabs, self-taken vulvo-vaginal swabs	Aptima Tubes - sample type specific	NAAT	3 days	Swabs must be received in the appropriate Aptima tube/ The following sample types can be tested however they have not been validated by the manufacturer for use; Eye swabs, Rectal swabs, Throat swabs

N.gonohorrea	Virology	Urine, Urethral swab, Vaginal swabs, self-taken vulvo-vaginal swabs	Aptima Tubes - sample type specific	NAAT	3 days	Swabs must be received in the appropriate Aptima tube/The following sample types can be tested however they have not been validated by the manufacturer for use; Eye swabs, Rectal swabs, Throat swabs
Urethral swab	Bacteriology	Male / female urethral	Sigma Transwab (ENT)	Routine culture and sensitivities	4 days	For STD screening.
Penile Swab	Bacteriology		Sigma Transwab (MW176S)	Routine culture and sensitivities	4 days	Use Urethral swab for STD screen.
MRSA	Bacteriology	Nose / axilla / groin others as protocol	Swabs - Single Sigma Transwab (MW176S) or double Sigma Transwab MW167S), CSU - Sterile Boricon universal, Sputum and Fluids - White top universal		2 days	If multiple screens required (e.g. MRSA and MRC) request screen in ICE, print labels, then request second screen and print labels. Both labels can be attached to the same swab (e.g. nose swab).
MSSA Infection screen MSSA Screening (Renal/ Spinal)	Bacteriology	Nose/ axilla/ groin others as protocol	Swabs - Single Sigma Transwab (MW176S) or double Sigma Transwab MW167S),, CSU - Sterile Boricon universal, Sputum and Fluids - White top universal		3 days	Only available for specific departments and covers MRSA.

Infection screen MRC Screening (Burns)	Bacteriology	Nose/ axilla/ groin others as protocol	Swabs - Single Sigma Transwab (MW176S) or double Sigma Transwab MW167S), CSU - Sterile Boricon universal, Sputum and Fluids - White top universal		3 days	If multiple screens required (e.g. MRSA and MRC) request screen in ICE, print labels, then request second screen and print labels. Both labels can be attached to the same swab (e.g. nose swab).
Infection screen Pseudomonas Screening (NICU)	Bacteriology	Nose/ axilla/ groin others as protocol	Swabs - Single Sigma Transwab (MW176S) or double Sigma Transwab MW167S),, CSU - Sterile Boricon universal, Sputum and Fluids - White top universal		2 days	If multiple screens required (e.g. MRSA and PSE) request screen in ICE, print labels, then request second screen and print labels. Both labels can be attached to the same swab (e.g. nose swab).
Urine	Bacteriology		Boric acid container	Routine culture and sensitivities Cell analysis by Microscopy (Automated/Manual)	3 days	Urine Microscopy (manual or automated) is carried out and cultures are set up depending on the microscopy result and patient category.
Legionella pneumophila: urinary antigen	Bacteriology	Urine	Universal (white top)	Enzyme Immunoassay	24 hours	
Streptococcus pneumoniae: urinary antigen	Bacteriology	Urine	Universal (white top)	Rapid test - Dipstick	24 hours	

Skin Scrapings	Bacteriology	Skin	Mycology collection kit		<15 days	Collect material from lesion with blunt scalpel blade - the edge is most likely to contain viable fungus. Please request kit from the laboratory.
Nail clippings	Bacteriology	Nail	Mycology collection kit		<15 days	Several small parings are preferred to one large sample. Please request kit from the laboratory.
Hair	Bacteriology	Hair	Mycology collection kit		<15 days	The hair follicle and 1" of proximal hair should be sent. Please request kit from the laboratory.

- See also Virology Molecular testing details in table below.

- **Virology**

Investigation	Department	Acceptable sample type	Sample container details	Test	Turnaround time	Special instructions
CMV (quantitative)	Virology	EDTA Blood sample		PCR (In house)	3 days	
CMV (qualitative)	Virology	Amniotic fluid, CSF, urine, bronchoalveolar lavage, sputum	Universal (white top)	PCR (In house)	3 days	
HSV 1 and 2	Virology	Blood	EDTA blood sample	PCR (In house)	3 days	
		CSF, vesicle fluid, bronchoalveolar	Universal (white top)			
		lavage, sputum,				
		Eye swabs and genital swabs	Flocked swab in viral transport medium			
Hepatitis C (qualitative)	Virology	Clotted blood		Molecular assay	5 days	
		EDTA Blood sample				
Hepatitis C (quantitative)	Virology	Clotted blood		Molecular assay	5 days	Plasma/Serum should be separated asap after collection ideally within 4 hours.
		EDTA Blood sample				
Hepatitis C (genotyping)	Virology	Clotted blood		Molecular assay	14 days	This test requires a minimum of 1.3ml serum as a Qualitative PCR is also performed to provide assurance that sample does not contain inhibitors which may affect genotype result

Hepatitis B (quantitative)	Virology	EDTA Blood sample		Molecular assay	5p days	
Parvovirus	Virology	Blood samples	EDTA blood sample	PCR (In house)	3 days	
		Amniotic fluid	Universal (white top)			
HIV (quantitative)	Virology	EDTA Blood sample		Molecular assay	7 days	Plasma should be separated asap after collection ideally within 4 hours.
Adenovirus – quantitative test	Virology	EDTA Blood sample		PCR (In house)	3 days	
Adenovirus - qualitative test	Virology	Eye swabs		PCR (In house)	3 days	
		Respiratory samples				
BK virus (quantitative)	Virology	blood, urine (immunocompromised		PCR (In house)	3 days	
Enterovirus	Virology	CSF	Universal (white top)	PCR (In house)	3 days	Eye swab, vesicle swab/ fluid
		Blood	EDTA blood sample			
		Throat swab	Flocked swab in viral transport medium			
		Faeces	Blue top universal with spoon			
VZV	Virology	CSF, blood, lesion/vesicle fluid or swab		PCR (In house)	3 days	
EBV (quantitative)	Virology	EDTA Blood sample		PCR (In house)	3 days	
EBV (qualitative)	Virology	CSF		PCR (In house)	3 days	
HHV6 – CSF, blood	Virology	CSF, Blood		PCR (In house)	3 days	
Susceptibility/resistance testing to oseltamivir (Pandemic vH1N1 2009 influenza only)	Virology	Respiratory samples		In house Molecular assay	On request	
Pertussis	Virology	Pernasal swab/NPA		Molecular assay	3 days	
Measles	Virology	Respiratory samples		PCR (In house)	3 days	
Mycoplasma genitalium	Virology	Genital samples		NAAT	3 days	Swabs must be received in the appropriate Aptima tube
Streptococcus serology (Anti-DNAse B, Antistreptolysin	Virology	Clotted blood sample			6 days	

(ASO))						
Bordetella pertussis Antibodies	Virology	Clotted blood sample		IgG	3 days	NB: Samples should be taken 2 weeks after onset of paroxysmal coughing
Borrelia burgdorferi (Lyme) Antibodies	Virology	Clotted blood sample		IgG and IgM	3 days	
Chlamydia trachomatis Antibodies	Virology	Clotted blood sample		IgG	3 days	For investigation of female infertility only.
Coxiella burneti (Q Fever) antibodies	Virology	Clotted blood sample		complement fixation test and Indirect Immunofluorescence test	7 days	
Cytomegalovirus antibodies	Virology	Clotted blood sample		IgG and IgM	3 days	
Epstein Barr Virus antibodies	Virology	Clotted blood sample		EBNA VCA IgG and IgM	3 days	
Helicobacter pylori Antibodies	Virology	Clotted blood sample		IgG	3 days	
Hepatitis A	Virology	Clotted blood samples		IgM and IgG detection	3 days	
Hepatitis B	Virology	Clotted blood samples		Antigen (HBsAG) and confirmation antibodies	3 days - Screen 7 days - Confirmations	Confirmation and marker tests are available for Hepatitis B
Hepatitis B	Virology	Clotted blood samples		Anti-HBs (Quantitative)	3 days	Test available for assessment of immunity post vaccination only
Hepatitis C	Virology	Clotted blood samples		Total antibody screening & confirmation testing	3 days - Screen 7 days - Confirmations	
Hepatitis E	Virology	Clotted blood samples		IgM	7 days	IgG available on request and done according to laboratory testing algorithm in certain patient risk groups e.g. pregnant
Herpes simplex virus type 1 and 2	Virology	Clotted blood samples		IgG	3 days	This test is not appropriate for the investigation of current/active Herpes infections./Please note this test does not distinguish between type 1 and type 2 Serology is rarely of value except in primary infections and some settings in pregnancy.
HIV 1 and 2 antigen/antibody	Virology	Clotted blood samples		Total Antibody/antigen	3 days - Screen	Confirmation testing is available and will be performed on all reactive samples if appropriate

				Confirmation	7 days - Confirmations	
HTLV antibody	Virology	Clotted blood samples		Total Antibody screening	3 days	Please note this test does not distinguish between type 1 and 2
Respiratory serology	Virology	Clotted blood samples		Complement fixation test	7 days	Test covers - Influenza A, Influenza B, M.pneumoniae, Chlamydia group, Respiratory syncytial virus, Adenovirus
Measles	Virology	Clotted blood samples		IgG and IgM	3 days	
Mumps	Virology	Clotted blood samples		IgG only	3 days	
Parvovirus	Virology	Clotted blood samples		IgG and IgM	3 days	
Rubella	Virology	Clotted blood samples		IgG and IgM	3 days	The laboratory provides both a screening test for IgG appropriate for the assessment of immunity and a full IgG and IgM profile for clinical investigations
Syphilis	Virology	Clotted blood samples		Total Antibody - Screening	3 days - Screen	The laboratory provides a screening service for the detection of antibodies to Treponemal sp. The laboratory is also a reference laboratory for Treponemal serology and provides a confirmation service.
				Confirmation testing - IgG and IgM	7 days - Confirmations	
Toxoplasma	Virology	Clotted blood samples		Total antibody & IgM	3 days	
Varicella zoster	Virology	Clotted blood samples		IgG only	3 days	

- **Environmental testing.**

Please contact the laboratory to discuss as these are not routinely available.

Routine Aerobiology (theatre, isolator room, BMT, AHU, pharmacy) but not for commissioning Theatres	Bacteriology	On request
Bioburden (SSD)	Bacteriology	On request
Environmental Monitoring	Bacteriology	On request
Susceptibility testing	Bacteriology	On request
Steriliser Performance and Commissioning checks (CSSD)	Bacteriology	On request

Appendix 3 – Clinical Details

(VTM= Virus Transport Medium)
(BTM = Bacterial Transport Medium – Sigma Transwab)
(PCB = Blood in plain or gel separation vacutainer with no additives)
Paired (PCB) = Acute and convalescent (10 -14 days after onset) serum

Clinical Diagnosis	Preferred Specimen (s)	Notes
Abscess	Pus or material in a clean leakproof screw capped universal container is preferable to a swab	
Actinomycosis	Pus or material from dacrocystitis in a clean leakproof screw capped universal container is preferable to a swab	
AIDS (Acquired Immune-Deficiency Syndrome)	Blood (PCB) for HIV antibody test	
Amoebiasis	Three specimens of faeces taken on separate days for cyst examination. 5 -10 ml of blood (PCB) for serology.	
Aspergillosis	Serum for aspergillus antibodies, antigen (galactomannan), beta-glucan and/or PCR, Sputum, BAL for galactomannan, microscopy and culture, sinus swab	
Bacteraemia	Blood culture.	See blood culture procedures above.
Bacterial Vaginosis	Air dried smear of vaginal discharge	Send on labelled glass slide in approved slide holder
Botulism (Food poisoning)	Blood (PCB) for toxin testing. Faeces and suspect food (if possible) for culture and toxin testing.	Consult a medical microbiologist
Neonatal botulism	Blood (PCB) for toxin testing	
Wound botulism infection	Pus/tissue specimens for culture and blood (PCB) for toxin testing	
Bronchiolitis	Nasopharyngeal aspirate (or BAL) for Polymerase chain reaction (PCR) for RSV, influenza A and B parainfluenza viruses, adenovirus and Rhinovirus.	
Brucellosis	3 sets of blood culture bottles.	See blood culture procedures above. **PLEASE ENSURE SPECIMEN IS LABELLED AS 'DANGER OF INFECTION'**
	Blood (PCB) for serology.	Consult a medical Microbiologist
Candidaemia	Blood culture	As for bacteraemia
Candida vaginosis	High vaginal swab	

Chickenpox	Vesicle fluid or swab in VTM for PCR Paired specimens of serum in certain circumstances	Discuss with a medical virologist
Chlamydia		
a)Respiratory infection	Paired PCB for serology.	
b)Genital infection		
Male	Either a urethral swab using chlamydia NAAT collection kit or first voided urine clearly labelled for chlamydia.	
Female	Endocervical swab or vulvo-vaginal swab using chlamydia/gonorrhoea NAAT collection kit. Urine or urethral swab may be sent in addition to the above but are not preferred alone unless no other specimens are possible.	
	Blood (PCB) for serology is sometimes helpful in PID.	
c)Conjunctivitis	Chlamydia/gonorrhoea NAAT swab (Aptima vaginal swab should be used for eye swabs)	
CJD	**DO NOT TAKE OR SEND SPECIMENS BEFORE CONSULTING A MEDICAL MICROBIOLOGIST**.	
Conjunctivitis	Swab for bacteriology in BTM	
	Swab for virus PCR in VTM	
	Chlamydia/gonorrhoea NAAT swab (Aptima vaginal swab should be used for eye swabs)	
Corneal Ulcer	Place scalpel with scraped material directly into glass bijou containing transport medium. Additional scrape material should be smeared onto 2 glass slides within the marked area (bacteriology and virology)	Corneal scrape kits available from laboratory – stock held in casualty at BEH (UHBristol) and on the Eye Ward (RUH)
	Label the frosted end with patient name	Please phone lab before sending and state if *Acanthamoeba* culture required
	Swab in VTM for viral detection by PCR	
Coxsackie virus infection	Faeces for enterovirus PCR	Consult a medical virologist if infection suspected in SCBU.
	Throat swab in VTM for enterovirus PCR	
	CSF from patients with meningitis	
Cryptococcosis	Biopsy	Consult a medical microbiologist
	CSF	
	Blood (PCB) specimen for antigen detection	
Cytomegalovirus	Clotted blood for CMV IgM/ IgG (PCB)	Discuss with a virologist if systemic infection is suspected

	EDTA blood is required for CMV DNA detection	Two independent urines taken as soon as possible after birth but no later than in the first three weeks of life should be taken to investigate congenital infection. Discuss with a virologist if considering antiviral therapy
	Plain urine in a 30 ml sterile container.	
	CSF, BAL, sputum may also be processed	
Cytomegalovirus (cont)		Obtain current blood sample from the mother if congenital infection is suspected.
Diarrhoea	Faeces - 3 specimens – do not send more than one specimen a day	If an outbreak is suspected, contact medical Microbiologist /Virologist
		Indicate any suspect food , travel abroad etc. on the request form and the occupation if relevant e.g. food handler, farmer etc
	(Faecal specimens need to be obtained as soon as possible after the onset of symptoms especially if viral diarrhoea is suspected)	Refer to 'food poisoning' section if relevant
	If patient has been in hospital for > 3 days only send a sample for *C. difficile*	
Diphtheria	Nose and throat swabs	Inform a medical microbiologist and the CCDC immediately.
		Details of immunisation history and foreign travel essential
	Swab of tropical ulcer or skin lesion	
Echovirus infection	Faeces for enterovirus PCR	Consult a medical virologist if infection suspected in SCBU
	Throat swab in VTM for enterovirus PCR	
	CSF from patients with meningitis	
Eczema	Swab of skin lesion	
	Swab in VTM for HSV and VZV PCR if eczema herpeticum is suspected	
Encephalitis	CSF	Discuss with a medical virologist Blood for serology (PCB) may be valuable in some cases.
	Faeces for enterovirus PCR	
	Throat swab in VTM	
Endocarditis	3 sets of blood cultures taken at least an hour apart over a period of 24 hours. If patient very unwell 3 specimens taken separately over 1 hour are acceptable this does not agree with advice in blood culture section earlier	See blood culture procedures above
	Blood (PCB) for Q Fever, Bartonella, chlamydia and fungal serology if indicated	
	Serial C – Reactive Protein (CRP) measurements	Send to Biochemistry
Enteric fever (Typhoid and paratyphoid)	Blood cultures	Consult a medical microbiologist immediately
	Urine for typhoid culture	Give details of foreign travel, contacts etc.
	Faeces (generally positive later in illness).	Clearance specimens are required

	Occasionally bone marrow for culture.	Notify to the CCDC.
Food poisoning	Faeces	Consult medical Microbiologist/ Virologist and notify CCDC.
	Suspected food	Faecal specimens should be obtained as soon as possible after the onset of symptoms especially if viral diarrhoea
	Vomit may be processed for Norovirus	Clearance specimens not normally required
Fungal infection of skin, hair and nails	Hair stumps	Mycology Transport packs are available from the laboratory or from the stores in Bath for transport of these specimens
	Skin scrapings	
	Nail parings	
Giardiasis	3 specimens of faeces taken on consecutive days for cyst examination	
Glandular fever (Epstein Barr Virus)	Blood (PCB) for serology	Send to Virology
	Monospot (Haematology)	
Gonorrhoea	Swabs or urine for NAAT	HVS are unsuitable for gonorrhoea culture (though suitable for NAAT)
	Sigma Transwab of urethra, endocervix, rectum, conjunctiva and throat as indicated	
Hand foot and mouth disease	Faeces , vesicle fluid or	Consult a medical Virologist
	Throat swab in VTM for enterovirus PCR	
Hepatitis (undiagnosed)	Blood (PCB) for antibody and antigen tests	
Hepatitis A, B, C, E	Blood (PCB)	Hepatitis C antibodies may not be detectable for up to 3 months after the date of onset
	EDTA blood is required for HBV and HCV viral load testing	Hepatitis C Qualitative PCR requires 1.5ml serum
		Hepatitis A IgM may not be detectable in the first week of the illness
Herpes simplex	Swab from the base of a lesion in VTM.	
HIV	Blood (PCB) for HIV antibody test	
	EDTA blood if HIV viral load required	
Hydatid disease	Blood (PCB) for antibody test	
Influenza	Throat swab in VTM or throat washings for PCR	
	Nasopharyngeal aspirate	The current PCR test detects influenza A (seasonal H3N2, H1N1, pandemic 2009 vH1N1, Avian H5N1) and influenza B
	Nose swab, sputum, BAL also processed	
	Paired (PCB)	Serology is not recommended for acute diagnosis.
Legionnaires disease	Sputum, lung biopsy, bronchial washings, pleural fluid for culture	
	Urine for antigen detection	

Leishmaniasis		**DISCUSS WITH A MICROBIOLOGIST AND DERMATOLOGIST BEFORE SENDING SPECIMENS**
Leptospirosis	Paired (PCB) for antibody test	Consult a Microbiologist
Listeriosis	Blood cultures	Consult a Microbiologist.
	CSF if clinically indicated	Serology is of no diagnostic value
Lyme disease	Blood (PCB) for antibody test	IgG antibodies to *Borrelia burgdorferi* are detectable in the majority of patients from 6 weeks after the onset of symptoms. A proportion of patients may produce detectable levels of antibody earlier. Date of onset plus clinical details supporting a diagnosis of infection must be supplied or specimens will not be tested
Lymphogranuloma venereum	Blood (PCB)	Swabs for PCR are appropriate where there is an ulcer or proctitis.
Malaria	2.5ml blood in **EDTA** –for thick and thin blood films (undertaken in Haematology)	Send specimens to Haematologist urgently. Consult Microbiologist or Infectious Diseases physician for clinical advice
		If small numbers of parasites are present repeat specimens may be required to make a diagnosis A minimum of 3 specimens is required to exclude malaria.
	NB. Consider the possibility of Viral Haemorrhagic Fever	
Measles	Throat swab in VTM	Contact public health to obtain salivary testing kit
	PCB for serology	
Meningitis	CSF	Discuss all suspect cases of meningitis with a medical microbiologist
	Blood culture	
	Throat swab for bacterial culture from the patient	Notify to the CCDC
	Blood (PCB) or EDTA container for PCR	
Meningitis (Viral)	**CSF and Throat swab**	
MERS	**DO NOT TAKE OR SEND SPECIMENS BEFORE CONSULTING A MEDICAL MICROBIOLOGIST/VIROLOGIST& INFECTION CONTROL**	Inform CCDC immediately the diagnosis is suspected
Molluscum contagiosum		Discuss with virologist
Mumps	Throat swab in VTM. Saliva is acceptable	Saliva collection kits are available from the Health protection units (0300 3038162) and are sent direct to Colindale for testing.
	Paired (PCB) for serology	
Myocarditis	Throat swab in VTM.	
Myositis	Faeces for enterovirus PCR	
	Paired (PCB) for serology	
Nocardiosis	Pus, tissue, for culture	
Non-indigenous mycoses:	Blood (PCB)	**Please discuss with Mycologist before sending specimens**
- Coccidioides	Other specimens may be indicated	

- Histoplasmosis		
- Paracoccidioides		
- Blastomyces		
Orf		Discuss with virologist
Osteomyelitis	Blood cultures	
	Deep operative specimens for culture	
	Blood (PCB) for ASO and Anti-staphylolysin tests is sometimes helpful	
	Consider serial CRP measurements	
Otitis Media	Ear swab in BTM	
Parvovirus (Erythrovirus)	Blood (PCB) for antibody test (and PCR if immunocompromised).	Must give date of onset and clinical details supporting diagnosis e.g. rash, arthritis, hydrops foetalis
Pelvic inflammatory disease	Combined HVS/Endocervical Sigma Transwab for gonococcal or other bacterial infection. Triple swabs (HVS, CX, URE) also acceptable	HVS are unsuitable for the diagnosis of gonorrhea culture but useful for NAATs
	Endocervical and/ or vulvo-vaginal swab for Chlamydia/gonorrhoea NAAT	
	Blood (PCB) for chlamydia antibody tests may be helpful in some cases	
Pneumonia	Blood cultures	Please give date of onset
	Purulent sputum for culture	Consider viral aetiology (send respiratory tract samples for PCR)
	Paired (PCB) for serology for atypical pneumonia screen	
	Urine for legionella antigen detection	
	BAL may be indicated but is essential if aspergillosis is suspected	
Poliomyelitis	CSF, Faeces	Consult a Virologist and inform the CCDC
	Throat swab in VTM	Please note that currently used polio vaccines do not contain live virus
Pseudomembranous colitis	Faeces for *Clostridium difficile* toxin. Specimen should be liquid or take shape of the collecting container	Clearance specimens are not required
Psittacosis	Paired (PCB)	
Puerperal Fever	Blood cultures.	
	High vaginal swabs	
	Urine	
Pyrexia of unknown origin	Blood cultures	Discuss with a Microbiologist as other investigations may be required depending upon clinical history
	Throat swabs	
	Urine	

	Faeces	
	Paired (PCB)	
Q Fever (Coxiella infection)	PCB for antibody tests if endocarditis suspected. Otherwise paired (PCB)	
Rabies	**DO NOT TAKE OR SEND SPECIMENS BEFORE CONSULTING A MEDICAL MICROBIOLOGIST OR**	Inform CCDC immediately the diagnosis is suspected
	VIROLOGIST	
Respiratory syncytial virus (RSV)	Nasopharyngeal aspirate , Nose and throat swabs for PCR	
	BAL	
	Sputum	
Rheumatic fever	Blood (PCB) for ASO test	
Rickettsial infection	Blood (PCB)	Consult a Virologist. Full clinical details including travel history are essential to determine appropriate tests by the reference laboratory.
Rubella	Blood (PCB) for antibody tests	Clinical details are essential to determine the appropriate tests required.
SARS (severe acute respiratory syndrome)	**DO NOT TAKE OR SEND SPECIMENS BEFORE CONSULTING A MEDICAL MICROBIOLOGIST/VIROLOGIST& INFECTION CONTROL**	Inform CCDC immediately the diagnosis is suspected
Schistosomiasis	Urinary - 3 complete specimens of urine in 150 ml containers taken between 1000h – 1400h	Please discuss – depends on geographical risk
	Alternatively send a 24h collection of terminal urine. Rectal - 3 faeces specimens.	Antibodies do not appear until at least 6 weeks post exposure. Ova not passed until 6-12 weeks post exposure. If asymptomatic, defer serology screening until 3 months post exposure
	Rectal biopsy.	
	Blood (PCB) for antibody tests	
Septic arthritis	Blood cultures	
	Joint aspirate	
	Serial CRP measurements are useful for monitoring treatment	
Septicaemia	Blood cultures (see bacteraemia)	NB. If meningococcus is suspected, send an EDTA blood for PCR
	Urine	
	Relevant specimens from presumed primary focus if available	
Shingles	Vesicle fluid for PCR	Discuss with a Virologist.
	Vesicle swab	Serology is not helpful.
Spontaneous Bacterial Peritonitis (SBP)	Ascitic fluid in plain sterile,	Cell count and differential will only be performed if clinical details state SBP
	leakproof container	

	IN ADDITION – ascitic fluid may be inoculated into a blood culture set	
Streptococcal sore throat	Throat swab	Please state if patient works in healthcare setting
Strongyloidiasis	See Worms	Blood for serology (PCB)
Sub acute sclerosing panencephalitis (SSPE)	CSF and paired blood (PCB)	Consult a medical virologist
Tonsillitis	See streptococcal sore throat	
Toxocariasis	Blood (PCB) for antibody test.	
Toxoplasmosis	Blood (PCB) for antibody test.	Details of symptoms, date of onset etc. is vital, especially if the patient is pregnant.
Trichiniasis	Blood (PCB) for antibody test.	
Trichomonas	HVS - Sigma Transwab	
Trypanosomiasis	2.5 ml blood in EDTA	Consult a Microbiologist.
	Blood (PCB) for antibody test	
Tuberculosis		
a) Respiratory	3 consecutive daily early morning specimens of sputum for AAFB	
	Only send if patient has proven sterile pyuria, is immuno -compromised or after discussion with a medical microbiologist:	
b) Renal	3 complete early morning specimens of urine	Large volume urine containers available from laboratory stores on request
c) Other sites	Consult a Microbiologist.	
Typhoid / paratyphoid	See enteric fever.	
Ulcers & pressure sores	Only recommended if associated pain, cellulitis, inflammation, discharge or pyrexia	Cultures often contaminated with colonising flora. Topical cleansing is the treatment of choice unless associated cellulitis, inflammation, pain, discharge or pyrexia
	Take deep swab of the ulcer	Common reservoir for MRSA
Ulcer-viral	Swab in VTM if considering viral cause (HSV)	
Urethritis	Aptima swab for chlamydia /gonorrhea NAAT	
	Sigma Transwab for microscopy and gonococcal culture	
Viral Haemorrhagic Fever	**DO NOT TAKE OR SEND SPECIMENS BEFORE CONSULTING A MEDICAL MICROBIOLOGIST/ VIROLOGIST**	Processing in specialist containment laboratory required
Weil's disease	See Leptospirosis.	
Whooping cough	ENT Sigma Transwab	Available on request from laboratory
	Blood for serology	

Worms/ Faecal Parasites e.g. Ascaris (roundworm) ,Ancylostoma or Necator (hookworm), Taenia (tapeworm), Clonorchis (liver fluke), Trichuris, Strongyloides	Send faeces with any relevant clinical details e.g. foreign travel, anaemia, eosinophilia etc Send whole worm or segment if available in a clean, leakproof, screw capped container A small amount of physiological saline may be added to prevent desiccation	
Enterobius vermicularis (thread worm)	Send an early morning sellotape slide: Stick clear sellotape to perianal skin area, peel off and apply sticky surface to labelled microscope slide. Send slide with tape affixed in slide box	
Mesenteric adenitis / lymphadenitis, terminal ileitis, Reactive arthritis	Faeces for *Yersinia*	May present as acute appendicitis Please discuss first with a medical microbiologist

Appendix 4 - Referred tests

TATs given are approximate as individual reference laboratories TATs are outside of the Bristol Infection Sciences laboratory's control. The TATs for these referred tests are for guidance only and represent average times before reports are issued from the Bristol Laboratory.

Referral Tests	Reference laboratory	Sample type							TAT	Comment
		Faeces	Plasma	Urine	Serum	CSF	Isolate	Other		
ACV Resistance	PHE Birmingham		✓						7-14 days	
Amoebiasis	Clinical Parasitology Department The Hospital for Tropical Diseases	✓			✓				Blood : 14 days Faeces; 7-14 days	
Amoebic serology for invasive disease	London School of Tropical medicine								7-14 days	
Anti campylobacter titre	PHE Manchester				✓				14 days	
Antiviral assays (acyclovir, ganiclovir)	Virus Reference Unit PHE Colindale							On request	Toxin: 1 day Final report: 7 days	
Arboviruses & Rickettsia (alphaviruses and flaviviruses, including Dengue and West Nile)	Rare and Imported Pathogens Laboratory PHE Porton Down				✓	✓			7-14 days	
Bacterial identification	Colindale						✓		7-14 days	
Borrelia burgdorferi (Lyme) (for confirmation of screen positive specimens)	Rare and Imported Pathogens Laboratory PHE Porton Down				✓				7- 14 days	
Botulinum	Enteric Laboratory Food Safety Microbiology Lab PHE Colindale	✓							7-14 days	
Botulinum toxin serology	Colindale Food & Water				✓				7-14 days	
Campylobacter Identification	Gastrointestinal Bacteria reference unit PHE Colindale						✓		7-14 days	
Campylobacter serology	PHE Preston (NOT CSF - serum only)				✓				7-14 days	
CJD	CJD Surveillance Unit Western General Hospital							Discuss with ref lab	>14 days	
CJD genetic marker (14-3-3)	CJD Reference Lab. Edinburgh							Discuss with ref lab	Available on request – testing must be arranged with laboratory prior to sending	
Cysticercosis	Clinical Parasitology Department 3rd Floor The Hospital for Tropical Diseases							✓	14 days	
Referral Tests	**Reference laboratory**	**Sample type**							**TAT**	**Comment**

		Faeces	Plasma	Urine	Serum	CSF	Isolate	Other		
Dengue Antibodies	Rare and Imported Pathogens Laboratory Centre for Applied Microbiology & Research				✓				7-14 days	
Diphtheria (immunisation response)	Vaccine reference unit Manchester Medical Microbiology				✓				28 days	
E. Coli 0157 Antibody	Gastrointestinal Bacteria Reference Unit				✓				7-14 days	
E. Coli 0157 Verotoxin & typing	Gastrointestinal Bacteria reference unit PHE Colindale							✓	7-14 days	
Echinococcus serology	London School of Tropical medicine				✓				10 days	
Erlichia (osis)	PHE Southampton								7-14 days	
Fasciola serology	London School of Tropical medicine				✓				7-14 days	
Filaria CFT	Clinical Parasitology Dept 3rd Floor The Hospital for Tropical Diseases				✓				7-14 days	
Ganciclovir Resistance	Antiviral Sus/Ref Laboratory Health Protection Agency Birmingham Heartlands Hospital		✓						14 days	
Giardia Antibodies	Clinical Parasitology Department The Hospital for Tropical Diseases				✓				7-14 days	
Group A Strep serotyping	PHE Colindale							✓	7-14 days	
Haemophilus Antibodies	Vaccine reference unit Manchester Medical Microbiology				✓				7-14 days	
Haemophilus PCR	PHE Oxford							✓	7-14 days	
Hantavirus Antibodies	Rare and Imported Pathogens Laboratory Centre for Applied Microbiology & Research Porton Down				✓				7-14 days	
Hepatitis B (Staff) DNA	Public Health Laboratory Birmingham Heartlands Hospital				✓				3-4 weeks	
Helicobacter pylori PCR	Bacteriology Reference unit PHE Colindale							✓Biopsies	7-14 days	
Hepatitis D	Sexually Transmitted & Blood Borne Virus Lab PHE Colindale		✓						15 days	
Hepatitis E PCR	Sexually Transmitted & Blood Borne Virus Lab PHE Colindale	✓	✓		✓				14days	
HIV Resistance Testing	Public Health Laboratory Birmingham Heartlands Hospital		✓						7- 14 days	

Referral Tests	Reference laboratory	Sample type							TAT	Comment
		Faeces	Plasma	Urine	Serum	CSF	Isolate	Other		
Human Herpes Virus 8	Sexually Transmitted & Blood Borne Virus Lab PHE Colindale							✓	15 days	
Hydatid	Clinical Parasitology Department The Hospital for Tropical Diseases							✓	Blood: 7- 14 days	
JC PCR	Virus Reference Laboratory Immunisation & Diagnosis Unit					✓			7- 14 days	
Legionella (Urine For Culture)	Legionella Reference Unit Atypical Pneumonia Unit PHE Colindale				✓				Preliminary report 2 days Confirmation report: 7- 14 days	
Legionella Antibodies	Legionella Reference Unit Atypical Pneumonia Unit PHE Colindale				✓				7- 14 days	
Legionella PCR	Bacteriology Reference unit PHE Colindale							✓ Non-Urine	7- 14 days	
Leishmaniasis	Clinical Parasitology Department The Hospital for Tropical Diseases				✓				7- 14 days	
Leptospirosis	Rare and Imported Pathogens Laboratory PHE Porton				✓				4 days	
Leptospirosis Meningococcus (immunisation response)	Rare and Imported Pathogens Laboratory Centre for Applied Microbiology & Research Porton Down				✓				7-14 days	
LGV	Sexually Transmitted & Blood Borne Virus Lab PHE Colindale				✓				7-14 days	
Lyme PCR	Rare and Imported Pathogens Laboratory Centre for Applied Microbiology & Research Porton Down					✓			(Preliminary report 5 days) Confirmation report: 7- 14 days	
Lyme serology (confirmation testing)	Rare and Imported Pathogens Laboratory PHE Porton				✓				5 days	
Meningococcal Reference (PCR)	Meningococcal Reference Unit Manchester Medical Microbiology		✓						Phoned report 2 days Final report 5-7 days	
Meningococcal Reference (Typing)	Meningococcal Reference Unit Manchester Medical Microbiology						✓		2-14 days	
MERs-Coronavirus	Birmingham PHE							✓	Urgent testing to be arranged prior to sending of samples	

Referral Tests	Reference laboratory	Sample type							TAT	Comment
		Faeces	Plasma	Urine	Serum	CSF	Isolate	Other		
Microfilariasis	London School of Tropical medicine							✓	7-14 days	
Mumps PCR	Virus Reference Laboratory (VRD) PHE Colindale							✓	7-17days	
Mycobacterium Tuberculosis Fastrack PCR	National Mycobacterium Reference Laboratory						✓		1-3 days	
Mycobacterium Tuberculosis ID and susceptibility	Mycobacterium Reference Laboratory Department of Medical Microbiology University Hospital of Wales						✓		2-4 weeks	
Mycoplasma genitalium PCR	Sexually Transmitted & Blood Borne Virus Lab PHE Colindale							✓	8 days	
Mycoplasma hominis PCR/Ureaplasma PCR	Sexually Transmitted & Blood Borne Virus Lab PHE Colindale					✓		✓	5 days	
Onchocerciasis	Clinical Parasitology Department The Hospital for Tropical Diseases							✓	7- 14 days	
Parechovirus PCR	Virus Reference Laboratory (VRD) PHE Colindale					✓			7-1 4 days	
Pneumococcal Antibodies	Pneumococcal Reference Unit Manchester Medical Microbiology				✓				7-14 days	
Pneumococcal antigen	PHE Birmingham (serum only)				✓				7-14 days	
Pneumococcal PCR	Pneumococcal Reference Unit Manchester Medical Microbiology		✓						Phoned report 2days Final report 5-7 days	
Polio Serology	Enteric & Respiratory Virus Laboratory PHE Colindale				✓				7-14 days	
Polyoma (JC) Antibodies	Virus Reference Laboratory (VRD) PHE Colindale				✓				10 days	
PVL toxin or gene	PHE Colindale						✓		7-14 days	
Rabies (immunisation response)	Animal Health & Veterinary Laboratories Agency (AHVLA)				✓				7-14 days	
Rickettsial serology	Rare and Imported Pathogens Laboratory PHE Porton				✓				4 days	
Rift Valley Fever	Rare and Imported Pathogens Laboratory Centre for Applied Microbiology & Research Porton Down				✓				7-14 days	
Salmonella	Gastrointestinal Bacteria Reference unit						✓		7-14 days	

Referral Tests	Reference laboratory	Sample type							TAT	Comment
		Faeces	Plasma	Urine	Serum	CSF	Isolate	Other		
Salmonella & shigella confirmation & typing	Gastrointestinal Bacteria reference unit PHE Colindale						✓		14-28 days	
Schistosoma serology	London School of Tropical medicine				✓				7-14 days	
Schistosomiasis (Bilharzia)	Clinical Parasitology Department The Hospital for Tropical Diseases				✓				7-14 days	
Staph toxin	PHE Colindale						✓		7-14 days	
Staph typing (+MRSA)	PHE Colindale						✓		7-14 days	
Strep group A surveillance	PHE Colindale						✓		7-14 days	
Stronglyoides	Clinical Parasitology Department The Hospital for Tropical Diseases				✓				7-14 days	
Tetanus (immunisation response)	Vaccine reference unit Manchester Medical Microbiology				✓				28 days	
Tetanus ID & toxin	Foodborne Pathogens Safety Unit PHE Colindale (FSMI)						✓		7-14 days	
Tick ID	Bristol University, FAO Dr Lee							✓	7-14 days	
Toxocariasis	Clinical Parasitology Department The Hospital for Tropical Diseases				✓				7-14 days	
Toxoplasma serology (confirmation testing)	PHE Swansea				✓				7 days	
Toxoplasmosis (confirmation/PCR)	NPHS Microbiology Singleton Hospital Swansea				✓	✓ (PCR only)			7-14 days	
Trichinella CFT	Clinical Parasitology Department The Hospital for Tropical Diseases				✓				7-14 days	
Trypanosomal IFAT	London School of Tropical medicine							✓	7-14 days	
Trypanosomiasis	Clinical Parasitology Department The Hospital for Tropical Diseases				✓				7-14 days	
Typhoid Antibodies	Gastrointestinal Reference Unit 61 Colindale Avenue				✓				7-14 days	
Typhus	Rare and Imported Pathogens Laboratory PHE Porton Down							✓	7-14 days	
Vibrio spp. confirmation & typing	Gastrointestinal Bacteria reference unit PHE Colindale						✓		7-14 days	

Referral Tests	Reference laboratory	Sample type							TAT	Comment
		Faeces	Plasma	Urine	Serum	CSF	Isolate	Other		
Viral Haemorrhagic Fevers (e.g. Lassa, Ebola	Rare and Imported Pathogens Laboratory PHE Porton Down				✓			✓	Discuss with laboratory before sending sample	
Weils (disease)	See Leptospira									
West Nile Fever	Rare and Imported Pathogens Laboratory PHE Porton Down				✓				7-14 days	
Whipples	Microbiology Great Ormond Street Hospital		✓			✓		Gastric biopsy	7-14 days	
Widal	PHE Colindale							✓	7-14 days	
Yellow Fever	Special Pathogens Reference Laboratory PHE Porton Down				✓				7-14 days	
Yersinia typing	Gastrointestinal Bacteria reference unit PHE Colindale						✓		7-14 days	