UK Health Security Agency

NHS Severn Pathology
North Bristol NHS Trust

Severn Pathology

Bristol Infection Sciences Laboratory

User Manual

Date of issue: 20.06.2025

Copy control: Severn Pathology website

Any copy printed in a ward, GP surgery or other location outside the Bristol laboratory's 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.

Amendment History

Date	Old revision no.	New revision 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	TATs 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 29	Influence of transport on sample integrity & collection of samples by patient Changes to blood cultures services Information on availability of MU Amendments to personnel
October 2018	2.1	2.2	Page 6 Page 8 Appendix 1	Accreditation link added Updated information for patients Contact details for MRL updated
March 2019	2.2	2.3	Intro p. 4 p.20 Appendices 1, 2, 3	General review – some information amended for clarity Updated with respect to new tests available Contact details updated New tests added Referral locations added
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	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
Jan 2021	3.0	3.1	Page 14 Page 20 Page 22 Page 28 Appendix 1	Clarification on transport of temperature sensitive sample types Addition of SARS Molecular test to repertoire Comment regarding preferred sample types for Bacteriology Screening service details updated (MSSA, CPE, MRC) Individual’s details updated following staffing changes
January 2023	3.1	4.0	Header & whole document Pages 4 & 5 Page 11 Page 22 Pages 19 & 40 Page 23 Page 27 Page 38 Page 61 Appendix 2	Organisational logo updated Update references to UHBristol & WAHT to UHBW & PHE to UKHSA Addition of document control Links to subsections added Updated link to ARL user manual Removal of references to Q fever serology Update names of staff in key positions Updated Virology scope Sample volume for faeces updated to one-third full (minimum of 10 ml) Movement of C trachomatis NAAT testing to Virology section Inclusion of description of notification of significant antenatal screen results in Screening Tests section Update information re: examination for threadworms Reorganisation of tables to separate Bacteriology investigations from Virology ones. Update circumstances for Yersinia culture. Update TATs for B. pertussis serology, fluid MCS and MSSA screens

			Appendix 3 Appendix 4 Appendix 5	Removal of acanthamoeba culture from testing repertoire Removal of PCP IF and CFTs from Virology testing repertoire Full review and update by Virology clinical team Full review of referral tests Addition of new appendix providing information on sample collection
March 2023	4.0	4.1	Page 25	Updates to serology assays made according to managed service contract
March 2023	4.1	4.2	Title page All Page 19 Page 41 Page 43 Page 44 Appendix 4	UKAS symbols removed from title page References to Clostridium updated to Clostridioides for accuracy Weekend RUH transport time added Link to UKAS scope updated Ms K Lomas added to the laboratory management table Dr S Gillett noted as being IDPS Lead HBV (staff only) removed as not referred to Birmingham anymore
April 2023	4.2	4.3	Title page Pp. 26-29 P. 33	Updated and footer added Blood culture section updated Information added to urine section on optimal specimen volume for boric acid container
June 2025	4.3	4.4	Header P. 9 P. 9 & 18 P. 11 P. 14 P.15–18 P. 18 P. 20 P. 24 P. 28 P. 30–31 P. 39 P. 41 Appendix 1 Appendix 2 Appendix 5	UKHSA logo updated Link to order consumables added Details of blood culture loading at different sites updated Removal of reference to satellite laboratory Unity clinic Patient sample collection links removed as no longer working Requesting section updated to reflect requirements of recent HSE FSN High risk sample section moved, and rejection section updated Update blood culture loading details at NBT Contact details link to Severn Path website added Blood culture section updated according to SMI *C. difficile* section updated with current testing criteria. Faeces & OCP sections updated with information relevant to molecular test panels. NAAT section updated with information on Ct values and their relevance Addition of tissue as a sample type List of consultants and contact details updated Sample types and containers updated. Environmental testing removed. Further information on testing added according to change requests. Format changed and sample collection information updated

Contents

USEFUL TELEPHONE NUMBERS

For full listing see Appendix 1.

Southmead Hospital switchboard: Telephone 0117 950 5050

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

Infection Sciences General 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 meningitis and other infectious disease notification please call 0300 3038162

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

North Bristol Trust (NBT) site	**0117 414 8406**
United Hospitals Bristol & Weston – Bristol Royal Infirmary (BRI) site	**0117 342 2573**
Royal United Hospital Bath (RUH) site	**01225 82 4724**

Alternatively, contact Pathology consumables by email at:
pathologyconsumablessouthmead@nbt.nhs.uk

Or order directly from Pathology stores at:
https://www.nbt.nhs.uk/severn-pathology/requesting/consumables-ordering

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 and Weston NHS Foundation Trust (UHBW), 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 UK Health Security Agency (UKHSA). As part of this collaboration, NBT and UKHSA 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

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

Clinical Bacteriology

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

Reference Laboratory Services

The UKHSA supports several reference laboratories nationally and the Mycology Reference Laboratory 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 biomarkers, 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, the North Bristol Trust (NBT) site 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.

Satellite laboratories

UHBW Pathology – Bristol Royal Infirmary & Weston

A satellite clinical Bacteriology service is situated at both sites within the United Hospitals Bristol and Weston (UHBW) Pathology departments. These provide on-site clinical support and infection control advice to the UHBW NHS Trust. In addition, blood cultures taken at Bristol and Weston sites are receipted and loaded onto instrumentation by UHBW pathology staff with oversight from the Infection Sciences laboratory 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.

Laboratory Scope

The combined services provided by the Infection Sciences laboratory is documented in this user manual and both laboratories' scopes have been accredited by UKAS (UKHSA 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:

- North Bristol Trust (Bacteriology and Antimicrobial Reference Laboratory)

8099 Medical Single (ukas.com)

- UK Health Security Agency Laboratory (Bacteriology, Virology and Mycology Reference Laboratory)

8043 Medical Multiple (ukas.com)

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 – 08:00h	On call

RUH Site

Daily	09:00h – 17:00h	Routine laboratory hours
	17:00h – 09:00h	On call

Specimen processing protocols during these hours will be determined by dept. and the type of request.

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 UHBW 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 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 the clinical virologist on call should 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 subject to agreement by the clinical virologist.

Duty incident management

The laboratory provides 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 from the day before and perform essential tests. They are not available for non-essential work or enquiries but will provide an on-call service for urgent requests. 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 – specimen collection

Specific information on specimen collection is provided in Appendix 5.
Details of sample containers for different investigations are provided in the test repertoire listing in Appendix 2. A quick guide to sample types and containers is published at Infection Sciences (Microbiology & Virology) | North Bristol NHS Trust

Sample integrity

Specimens submitted for certain laboratory procedures should be transported to the laboratory ASAP or according to transport requirements. 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 Act 2004.

Further guidance on sample collection for specific sample types is detailed in Appendix 5.

Protecting personal information

North Bristol Trust and UK Health Security Agency 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 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 are 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 to Infection Sciences in order 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, notification of hazard/high risk, 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 via the links below or on request:

Antimicrobial reference laboratory – https://www.nbt.nhs.uk/severn-pathology/pathology-services/antimicrobial-reference-laboratory/antimicrobial-reference

Mycology reference laboratory - https://www.gov.uk/government/publications/mycology-reference-laboratory-mrl-service-user-handbook

Virology specialist services – Infection Sciences (Microbiology & Virology) | North Bristol NHS Trust (nbt.nhs.uk) or email 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 correctly by placing an 'X' accurately within the box to indicate a test is required. Do not use a tick and do not strike through selection boxes. 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.

Essential information when completing request forms

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 are 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 request 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 an appropriate container. 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.

High risk specimens

Although a 'Universal Precautions' policy is adopted in the laboratory, if specimens are taken from patients known or suspected to present a health hazard to laboratory staff, e.g. TB, typhoid and paratyphoid, brucellosis, the following steps should be undertaken:

- Please call the Infection Sciences Laboratory PRIOR to the specimen being sent
- Identify the specific risk when completing the request
- Clearly label the specimen with "HIGH RISK" sticker on the outside of the specimen bag.

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.

Relevant risk that MUST be included on the specimen request include:

- Recent travel history (especially outside of Western Europe)
- Consumption of unpasteurised milk or cheese products
- Contact with imported animals
- Other relevant clinical symptoms or information

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 (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 “HIGH RISK” 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 tube system and the laboratory must be contacted prior to the sample being sent so that appropriate arrangements can be made.

Please note: for in-patient transfers of confirmed patients with HCID to 27B, please follow the separate HCID policy High Consequence Infectious Diseases (HCID) Policy - LINK.

REJECTION POLICY

Incorrectly labelled/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

The laboratory is unable to test inappropriate specimens or samples received in incorrect containers as they are not validated for the test requested and the results may be unreliable. Such samples will not normally be process and will generally be rejected and a report issued requesting submission of the correct specimen type or sample in the correct container. Any such specimen that is difficult to repeat will be stored for a period of time.

Other specimens 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
- unsafe specimens, such as needles

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

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 them 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 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 blood cultures.

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 laboratory locations.

RUH

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

NBT

Blood cultures taken within wards on the NBT hospital site are received and loaded up until 20:00hrs by the Infection Sciences staff onto instrumentation located within the main NBT Infection Sciences laboratory. Overnight blood cultures are loaded onto instrumentation in Pathology Specimen Reception.

UHBW

Blood cultures taken within the United Hospitals Bristol and Weston are received and loaded onto instrumentation located within their respective Pathology departments.

North Bristol Trust (NBT)

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

United Hospitals Bristol & Weston (UHBW)

Transport from within the UHBW Bristol site is provided by porters who undertake several ward and department collections throughout the day. There are also regular deliveries from all UHBW Bristol hospital sites direct to laboratory medicine at UHBW. The UHBW Bristol pneumatic tube system may also be used where appropriate (see below). Specimens are transported to the NBT site via regular courier transport runs from UHBW Bristol and Weston sites. 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-arranged couriers (DDL). 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 (RUH)

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
Weekend Couriers (Sat/Sun & Bank holidays)	0915h – 0930h	1000h – 1030h
	1300h	1400h

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 UHBW Bristol 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

RESULT ENQUIRIES

Accessing Electronic 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 with 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 as 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.

Telephone & Email Enquiries

The laboratory is very busy therefore it is appreciated if telephone calls are restricted as far as possible for results that are not yet available electronically but expected, or for those requiring clinical discussion. Refer to Turnaround Time (TAT) guidelines given in Appendix 2.

Contact details for each department are provided in an infographic posted on the Infection Sciences page of the Severn Pathology website which is available via this link Infection Sciences Contact Information

Results from Urgent Requests

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

Results from within the NBT/UHBW/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 the appendices of this document.

Out of hours clinical advice may be accessed via NBT/UHBW/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.

Measurement Uncertainty

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 three 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 (Deborah.Williams2@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 Martin Williams – Infection Sciences Clinical Lead
- Mr Jonathan Steer – UKHSA Regional Head of Operations
- Mrs Deborah Williams – 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 – see Appendix 4.
The list below, although not exhaustive, gives an indication of the laboratory's repertoire. Please also refer to Appendix 2 for further information.

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
  - Fluids, aspirates, pus and swabs from all sites
  - Genital specimens
  - Ocular specimens
  - Sputum
  - Urine
- Routine molecular detection of bacteriological, viral and parasitic targets from the following clinical specimens:
  - Faeces
  - Cerebrospinal fluid
- 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
- *Clostridioides difficile* toxin

- Cross Infection Screening
- Susceptibility testing
- Urinary antigen testing

Royal United Hospital Trust, 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 Hospitals Bristol and Weston Trust, BRI 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)

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

ANTIMICROBIAL Reference Laboratory

The Antimicrobial 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:
https://www.nbt.nhs.uk/severn-pathology/pathology-services/antimicrobial-reference-laboratory/antimicrobial-reference-laboratory-resources

VIROLOGY

North Bristol Trust site

- Clinical advice / Infection Control
- Nucleic acid amplification tests (NAAT) for the following:
  - *Chlamydia trachomatis*
  - *Neisseria gonorrhoeae*
  - *Trichomonas vaginalis*
  - *Mycoplasma genitalium*

- Bacterial vaginosis
- Hepatitis B (quantitative)
- Hepatitis C (quantitative, optional genotyping)
- HIV (quantitative)
- CMV (quantitative/qualitative)
- EBV (quantitative)
- BK virus (quantitative)
- HHV6
- Parvovirus
- HSV 1 and 2
- VZV
- Adenovirus (quantitative/qualitative)
- Enterovirus
- Respiratory viruses (Influenza A and B, RSV, SARS-CoV-2, human metapneumovirus, adenovirus, parainfluenza viruses 1,2,3 & 4, rhinovirus) (N.B. More respiratory targets available via Biofire testing)
- Bordetella spp.
- Measles

N.B. Gastroenteritis viruses (norovirus, adenovirus, rotavirus, astrovirus, sapovirus) are now part of routine molecular gastroenteritis detection of bacteriological, viral and parasitic targets in Bacteriology

- Serological tests for the following:
  - Diasorin Liaison XL assays
    - Borrelia burgdorferi (Lyme) IgG & IgM antibody
    - *Chlamydia trachomatis* IgG antibody (qualitative, infertility investigation only)
    - Cytomegalovirus IgG & IgM antibody
    - Epstein Barr Virus (EBV) IgG & IgM antibody
    - *Helicobacter pylori* IgG antibody
    - Hepatitis A Total Ab & IgM antibody
    - Hepatitis B surface antigen
    - Hepatitis B ‘s’ antigen antibody (anti-HBs)
    - Hepatitis B core antibody
    - Hepatitis B confirmation markers (HBeAg, antiHBe, HBcore IgM)
    - Hepatitis C IgG antibody
    - Hepatitis E IgG & IgM antibody
    - Herpes simplex virus IgG antibody (does not distinguish between types 1 and 2)
    - HIV 1 and 2 antigen/antibody
    - HTLV 1 and 2 antibody
    - Measles virus IgG & IgM antibody
    - Mumps IgG antibody
    - Parvovirus B19 IgG & IgM antibody
    - *Bordetella pertussis* IgG antibody (whooping cough)
    - Rubella IgG & IgM antibody
    - *Treponema pallidum* (syphilis) IgG antibody
    - Toxoplasma IgG & IgM antibody
    - Varicella zoster IgG antibody
  - Biomerieux VIDAS 3 confirmation assays
    - Hepatitis B surface antigen
    - Hepatitis B core antibody

- HIV 1 and 2 antigen/antibody

– Manual assays
  - Anti-streptolysin antibody (ASO)
  - Syphilis RPR
  - *Treponema pallidum* IgM antibody
  - *Treponema pallidum* IgG blot
  - HIV 1 & 2 antibody (Typing assay – Serosep Geenius)

COLLECTION OF SPECIMENS & INTERPRETATION OF RESULTS

Where testing is required by multiple departments within Infection Sciences, e.g. Virology, Mycology and Bacteriology, it is advisable to send a separate sample to each laboratory.
Details of routine investigations and sample types and containers required are provided in Appendix 2.
For reference services, please refer to specific user manuals using the links on page 24.
Guidance on specimen collection is provided in Appendix 5 and a quick guide is available on the Severn Pathology website at Infection Sciences (Microbiology & Virology) | North Bristol NHS Trust

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. Details of turnaround times for specific investigations are provided in Appendix 2.

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. Some testing is only performed during the working week (Mon-Fri) and non-urgent samples arriving late in the day may not be processed until the following day.

The Infection Sciences Laboratory expects that 90% of test results will be available within the published TAT, however the following circumstances may affect the ability of the laboratory to meet this TAT:

- Samples requiring further testing or confirmation
- Additional tests requested after the initial order
- Samples requiring special extraction methods

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

Sufficient material should be provided for culture. **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 causative organism 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 therefore the laboratory does not need advance notification of them being taken. However, if there is an increased risk associated with the samples, 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 available. 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.

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, number and timing of samples

Blood culture volume is the most significant factor affecting the detection of organisms in bloodstream infection. There is a direct relationship between blood volume and yield per mL of blood cultured. False negatives may occur if inadequate blood culture volumes are submitted.

Ideally, blood samples should be taken prior to initiation antimicrobial treatment. Any recent or ongoing antimicrobial therapy can have a significant detrimental effect on the sensitivity of blood culture, which may lead to false negative results. On the other hand, samples collected whilst the patient is on treatment can reveal a new resistant causative pathogen.

The number of organisms present in adult bacteraemia is frequently low, often less that $1x10^3$ colony

forming units per litre (cfu/L). For adult patients it is recommended that 20 to 30 mL of blood be cultured.

- For BD BacTec bottles provided by the laboratory, the optimum volume is 8 to 10 mL blood per bottle for adults.
- In infants and children, the magnitude of bacteraemia is usually higher than that in adults; therefore, sensitivity of detection is not significantly reduced by lower blood to culture medium ratio. Low level bacteraemia (less than $4x10^3$ cfu/L) in neonates and children does occur with clinically significant organisms. One study suggests that for the reliable detection of low-level bacteraemia, 4.0 to 4.5% of a patient's total blood volume should be cultured. For BD BacTec bottles provided by the laboratory, the optimum volume is 1 to 3 mL blood per bottle for paediatric patients.

For the majority of patients, 2 sets of blood culture bottles (2x2 bottles, 40mL for adults) are recommended to detect bacteraemia. These can be collected in one draw. A third set taken from a different site increases yield although it also increases the risk of contamination. However, collecting a third set (total 3x2 bottles, 60mL) is recommended if candidaemia is suspected. If endocarditis is suspected, 3 sets of blood culture bottles (3x2 bottles, 60mL) should be collected as separate draws over a 24hr period. Samples should be taken as soon as possible after a spike of fever, as fevers and rigors occur 30 to 60 minutes after the entry of organisms into the bloodstream. However, one study has shown no significant difference in isolation rates for blood drawn either at intervals or taken simultaneously with fever spikes. Timing of sample collection may be less important in cases of continuous bacteraemia.

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. Please also refer to the blood culture policy of your organisation.

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.

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 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 come 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 & 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) and does not overlap the bottom rim. Bottles should be transported to the laboratory in plastic transport bags provided. If this is not possible, they should be kept at room temperature. Do NOT refrigerate.

Clostridioides 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 Bacteria, Giardia and Cryptosporidium PCR as well as *C. difficile* PCR 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 neutropenia
    - suspected nosocomial outbreak

Specimens from community patients are normally only tested for Bacteria, Giardia and Cryptosporidium PCR.

Requestors are prompted to test patients who fit the following criteria for *C. difficile* PCR:

- all aged 65 years or over
- hospital in-patients aged ≥ 2yrs
- recent hospitalization in those aged ≥ 2yrs
- recent antibiotic use in those aged ≥ 2yrs
- care / residential home outbreak
- history of antibiotic use within the previous 6 weeks
- patients from any source with a history of antibiotic exposure

A positive PCR result does not indicate the presence of a viable organism in the sample at the time of testing.

A positive result indicates the presence of the tcdB gene and is used for presumptive detection of toxigenic *C. difficile* organisms.

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. A sample container should be filled one-third full of stool (minimum of 10ml) for analysis. 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**.

Enteric PCR testing is only suitable for use with liquid / loose stool samples (Bristol Stool Chart 5-7). Formed stool samples will not be processed.

All specimens are routinely investigated for the following targets:

- *Campylobacter spp.*
- *Salmonella spp.*
- Shiga-like toxin-producing *Escherichia coli* (STEC)
- *Shigella spp.* and/or Enteroinvasive *Escherichia coli* (EIEC)
- *Vibrio spp.*
- *Yersinia enterocolitica*
- *Cryptosporidium spp.*
- *Giardia lamblia*
- *Entamoeba histolytica*

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**.

Enteric PCR is qualitative and does not provide a quantitative measurement of the detected organism nor indicate the amount of pathogen present in the sample.

A positive PCR result does not indicate the presence of viable organism in the sample at the time of testing.

Results should not be used as the sole basis for diagnosis, treatment, or other patient management decisions. Positive results do not rule out co-infection with other organisms that are not detected by this test and may not be indicative of the sole or definitive cause of patient illness.

Ova cysts and parasites

A sample container should be filled one-third full of stool (minimum of 10ml) for analysis. If there is going to be a delay in transport of more than 3-4 hours the specimen should be refrigerated.

If screening for *Cryptosporidium spp.* and *Giardia spp.* is required, a separate request for Bacteria, Giardia and Cryptosporidium PCR should be submitted.

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.
N.B. Faeces are <u>not</u> suitable for testing and will be rejected.

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 swabs

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.

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 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 Infection Control Policies.

Non-MRSA screening swabs

Swabs may be taken to screen for other organisms 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 dropdown 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.

Other screening swabs

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

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 UKHSA 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. The optimal sample volume for urines is 10ml. It is important that specimens are sufficiently filled to ensure an optimal boric acid concentration is maintained. Studies have shown that a boric acid concentration of 20mg/ml or greater can be bactericidal for some urinary pathogens (Meers and Chow, 1990).

- 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. N.B. If there is likely to be a delay in collection the specimen should be refrigerated.

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 Pathology consumables.
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

Send plain urine specimen for testing.

Wound Swabs and Pus

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 cell 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

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 and will be rejected.

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.

NAAT tests may generate results qualitatively (detection or not of the pathogen), quantitatively (typically

a viral load, such as HIV infection monitoring), or semi-quantitatively. The semi-quantitative results are typically expressed as a crossing threshold (Ct) value (the PCR cycle number at which the fluorescent signal crosses the background level of fluorescence and flags positive), such that a low Ct value is associated with a relatively high amount of pathogen in the sample, and high Ct value relates to a low amount of pathogen in the sample. Ct values range from 1 to 40 or 50. Low Ct values (strongly positive samples) are below 25; high values (weakly positive) are over 30. The laboratory does not report Ct values but may interpret them on a report as 'low positive'. Low positive NAAT results can reflect low levels of pathogen because the infection is in the recovery phase, but can also be observed in poorly taken specimens, or very early in infection (ramp up phase) before the pathogen has reached typical levels. The interpretation of low level NAAT results therefore requires factoring in clinical features, such as symptoms and date of onset, so that appropriate decisions can be made over treatment and infection control. Repeating the test on a new sample can help inform the significance of the result on the initial sample.

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.

Genital Chlamydia trachomatis & Neisseria gonorrhoeae 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:

Female

- 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.

Molecular detection of viruses

NAAT tests are available for the following viruses:

- Adenovirus
  - Blood (quantitative, immunocompromised patients), respiratory secretions, eye swabs, CSF (qualitative)
- Bordetella sp. (qualitative)
  - nasopharyngeal swab, throat swab
- BK virus (quantitative)
  - Blood, urine (immunocompromised)
- CMV (qualitative or quantitative)
  - Blood, amniotic fluid, CSF, urine, eye fluid (quantitative) bronchoalveolar lavage, sputum (qualitative), tissue (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 (norovirus only)
- Hepatitis B (quantitative)
  - Blood
- Hepatitis C (quantitative, optional genotyping)
  - Blood
- HIV quantitative (viral load)
  - Blood, CSF (rarely)
- HSV 1 and 2 (qualitative)
  - Lesion swab, CSF, blood, vesicle fluid, bronchoalveolar lavage, sputum, eye swabs, eye fluid, tissue
- HHV6 (qualitative or quantitative)
  - CSF (qualitative)
  - Blood (quantitative)
- Measles (qualitative)
  - oral fluids
  - throat (mouth) swab
  - EDTA blood
  - nasopharyngeal aspirate
- Parvovirus (quantitative)
  - Blood, amniotic fluid, tissue
- Respiratory viruses (Influenza A and B, respiratory syncytial virus, SARS-CoV-2, 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.
- VZV (qualitative)
  - Lesion swab, vesicle fluid, CSF, blood, eye fluid

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 links below:

- UK Health Security Agency Laboratory (Bacteriology, Virology and Mycology Reference Laboratory)

8043 Medical Multiple (ukas.com)

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, parvovirus and chickenpox immunity testing is not available as part of the routine antenatal booking screen in accordance with the IDPS guidance. Please indicate the reason clearly if any of these are included in the standard antenatal screening request.

Significant antenatal IDPS screen results will be notified to the relevant antenatal screening co-ordinators by the clinical virology team using the generic email address provided by the screening team. Results may also be telephoned if urgent action is required, or a specific clinical discussion is needed.

NOTIFICATION OF INFECTIOUS DISEASES

It is the statutory duty of the clinician responsible for a patient suffering from a notifiable disease. 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, UHBW and RUH intranet sites as well as the UKHSA National website at UK Health Security Agency - GOV.UK (www.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

North Bristol Trust site

- **Laboratory Management**

Post	Individual	Telephone	Email
Infection Sciences Service Manager	Ms Katy Lomas	0117 414 6267	Katy.Lomas@nbt.nhs.uk
UKHSA Head of Operations	Mr Jonathan Steer	0117 414 6239	Jonathan.Steer@ukhsa.gov.uk
Assistant Infection Sciences Services Manager & Head of Bacteriology	Ms Nicola Childs	0117 414 6218	Nicola.Childs@nbt.nhs.uk
Deputy Head of Bacteriology	Mr Samuel Stafford	0117 414 6051	Samuel.Stafford@nbt.nhs.uk
Head of Antimicrobial Reference Laboratory	Mr Alan Noel	0117 414 6295	Alan.Noel@nbt.nhs.uk
Deputy Head of Antimicrobial Reference Laboratory	Mr Mohanad Al-Habbal	0117 414 6279	Mohanad.Al-Habbal@nbt.nhs.uk
Virology Laboratory Manager	Mr Richard Hopes	0117 414 6276	Rich.Hopes@nbt.nhs.uk
Deputy Virology Laboratory Manager & STI Ref Lab Operational Lead	Ms Herty Narcho	0117 414 9895	Herty.Narcho@nbt.nhs.uk
Mycology Reference Laboratory Manager	Mr Mike Palmer	0117 414 6246	Michael.Palmer@nbt.nhs.uk
Pathogen Genomics Lead	Ms Charlie Reid	0117 414 6232	Charlie.Reid@ukhsa.gov.uk
Quality Manager	Mrs Deborah Williams	0117 414 6251	Deborah.Williams2@nbt.nhs.uk
Health and Safety Manager	Ms Carolyn Pugh	0117 414 6243	Carolyn.Pugh@ukhsa.gov.uk
IT Manager	Mr Ralph Ferguson	0117 414 6240	Ralph.Ferguson@nbt.nhs.uk

- **Medical/Clinical Scientist staff**

Post	Individual	Telephone	Email
Microbiology Clinical enquiries		0117 414 6222	
Clinical Lead Pathology & Consultant Microbiologist	Dr Isabel Baker	0117 414 6223	Isabel.Baker@nbt.nhs.uk
Bacteriology Clinical Lead & Consultant in Infection	Dr Julia Colston	0117 414 6264	Julia.Colston@nbt.nhs.uk
Consultant Medical Microbiologist	Dr Gaya Nayar	0117 414 6208	Gayathri.Nayar@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
Consultant Medical Microbiologist	Dr Jason Biswas	0117 414 6233	Jason.Biswas@nbt.nhs.uk
Secretaries to Microbiology		0117 414 6234	

Post	Individual	Telephone	Email
Secretary to Dr Darley		0117 414 6231	
Specialist Registrars		0117 414 1752 / 1754 / 1755 / 1765	
UKHSA National Clinical Lead for Virology & Consultant Clinical Virologist	Dr Matthew Donati	0117414 6256	Matthew.Donati@nbt.nhs.uk Matthew.Donati@ukhsa.gov.uk
Clinical Head of Virology & Consultant Clinical Virologist	Dr Sowsan Atabani	0117 414 7263	Sowsan.Atabani@nbt.nhs.uk
Consultant Clinical Virologist & IDPS Lead	Dr Sophie Gillett	0117 414 6237	Sophie.Gillett@nbt.nhs.uk
Consultant Clinical Scientist (Virology)	Dr Peter Muir	0117 414 6236	Peter.Muir@nbt.nhs.uk Peter.Muir@ukhsa.gov.uk
Consultant Clinical Scientist (Virology)	Dr Andrew Bosworth	0117 414 6283	Andrew.Bosworth@nbt.nhs.uk
Clinical Scientist (Head of Virology Molecular R&D)	Dr Barry Vipond	0117 414 6263	Barry.Vipond@ukhsa.gov.uk
Clinical Scientist	Dr Jiancheng Zhan	0117 414 6229	JianCheng.Zhang@nbt.nhs.uk
Acting Head of Mycology Reference Laboratory & Consultant Clinical Scientist (Mycology)	Professor Andrew Borman	0117 414 6286	Andy.Borman@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
Clinical Scientist (Antimicrobial Reference Laboratory)	Dr Julie Sunderland	0117 414 8471	Julie.Sunderland@nbt.nhs.uk

- **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 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)	Mobile phone via switchboard
Virology		Requests made through consultant clinical virologist via switchboard

BRI Site

- **Medical/Clinical Scientist staff**

Post	Individual	Telephone	Email
Infection Sciences Clinical Lead & Consultant in Infection	Dr Martin Williams	0117 342 9265	Martinx.Williams@uhbw.nhs.uk
Consultant Medical Microbiologist	Dr Rajeka Lazarus	0117 342 9266	Rajeka.Lazarus@uhbw.nhs.uk
Consultant Medical Microbiologist	Dr Phil Williams	0117 342 9267	Philip.Williams2@uhbw.nhs.uk
Consultant Medical Microbiologist	Dr Irasha Hettiarachchi	0117 342 7333	Irasha.Hettiarachchi@uhbw.nhs.uk
Specialist Registrars		0117 342 9269 / 9271	

General Enquiries and Laboratory Administration

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

Appendix 2 – Test/Procedure/Analyte

Bacteriology Testing Repertoire

Investigation	Dept.	Acceptable sample type	Sample container details	Test type	Turnaround time	Special instructions
Abscess	Bacteriology	Send pus in a clean leak- proof screw capped universal container or if material is limited, a swab in BTM.	Universal (white top)	Culture & sensitivities		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
Blood cultures	Bacteriology	Adults: 8-10mL blood per bottle Paeds: 1-3mL blood per bottle	Blood culture bottle set Paediatric culture bottle	Microscopy, culture & sensitivities	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.
Blood culture for *Mycobacterium sp.*	Bacteriology	3-5mL blood	TB blood culture bottle	Microscopy, culture & sensitivities	70 days	Please request kit from the laboratory. Positive culture is likely to be <14 days
Clostridioides difficile	Bacteriology	Faecal sample	Blue top universal with spoon	Molecular assay	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 *Clostridioides 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 one-third full.
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 & sensitivities	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's 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.

CSF	Bacteriology		Universal (white top)	Microscopy	4 hours	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, spectrophotometric analysis for xanthochromia is available from Clinical Chemistry. The presence of xanthochromia cannot be determined reliably by macroscopic appearance so is not reported in microbiology.
CSF	Bacteriology	300uL minimum volume	Universal (white top)	Molecular assay	4 hours	CSF from infants who are aged 1 year or less. CSF where the white cell count is >4 in those >1 year old. When encephalitis is suspected, regardless of cell count. Acute flaccid myelitis/paralysis, regardless of cell count. Immunocompromised patients, regardless of cell count.
CSF	Bacteriology		Universal (white top)	Culture & sensitivities	4 days	
Ear Swabs	Bacteriology		Sigma Transwab (MW176S)	Culture & sensitivities	4 days	
Eye swabs	Bacteriology		Sigma Transwab (MW176S)	Culture & sensitivities	4 days	Conjunctival swabs should be sent for the diagnosis of superficial infections. Use a Sigma Transwab (MW176S). N.B. Use an Aptima NAAT swab for chlamydia investigations. These are available from Pathology consumables.
Faeces culture	Bacteriology	Faecal sample	Blue top universal with spoon	Culture & sensitivities	4 days	Clearance specimens from patients previously positive with *S. typhi* or *S. paratyphi*
Fluids	Bacteriology		Universal (white top)	Culture & sensitivities	8 days	Microscopy for crystals performed by Cytology - please send a separate request. Please request TB culture if required.
Gastro-intestinal bacterial & viral pathogens	Bacteriology	Faecal sample	Blue top universal with spoon	Molecular assay	2 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. A sample container should be filled one-third full of stool (minimum of 10ml) for analysis. This test has been validated for stool samples that are liquid or semi-formed

						(Bristol Stool Scale (BSS) 5-7). The use of formed stool samples can produce false negative results. All formed stools, with the exception of those received via the Health Protection Team, will be rejected. Acceptable stool specimens are routinely tested for the following enteric pathogens by PCR: • *Salmonella enterica spp.* • *Shigella spp. / Enteroinvasive E. coli* • *Campylobacter jejuni / coli / lari* • *Yersinia enterocolitica spp.* • *Vibrio cholerae / parahaemolyticus* • *Shiga-like toxin-producing E. coli (STEC) stx1/stx2* • *Cryptosporidium parvum / hominis* • *Giardia lamblia* • *Entamoeba histolytica* Further testing of samples positive for bacterial pathogens may result in an extended TAT.
Gastro-intestinal parasites	Bacteriology	Faecal sample	Blue top universal with spoon	Microscopy	4 days	A sample container should be filled one-third full of stool (minimum of 10ml) for analysis. Please provide full travel history including dates. Full OCP will only be performed on patients with relevant clinical details. For patients with relevant travel or clinical history at least 3 consecutive samples of faeces should be obtained, **passed at different times and labelled with the date/time**. 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.
Genital Swabs	Bacteriology	HVS/ LVS/ Cervical/ Endocervical/ Vaginal	Sigma Transwab MW176S	Culture & sensitivities	4 days	For diagnosis of candidiasis 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.
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 72 hours prior to receipt. Minimum volume: sample container one-third full (minimum of 10 ml). 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.

Infection screen – CPE	Bacteriology	Rectal swabs ONLY, **and with visible faecal material.**	Purple top sigma Transwab	Culture	3 days	CPE (Carbapenemase producing Enterobacterales)
Infection screen – MRC	Bacteriology	Nose/axilla/groin, others as protocol	Swabs - Single Sigma Transwab MW176S or double Sigma Transwab MW167S	Culture	3 days	MRC screen for ESBL-producing Enterobacterales. 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).
		CSU	Sterile Boricon universal			
		Sputum and Fluids	Universal (white top)			
Infection screen - Pseudomonas (NICU)	Bacteriology	Nose/axilla/groin, others as protocol	Swabs - Single Sigma Transwab MW176S or double Sigma Transwab MW167S	Culture & sensitivities	3 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).
		CSU	Sterile Boricon universal			
		Sputum and Fluids	Universal (white top)			
Infection screen – VRE	Bacteriology	Rectal swabs ONLY, **and with visible faecal material.**	Purple top sigma Transwab	Culture	3 days	VRE (Vancomycin-resistant Enterobacterales)
Legionella pneumophila urinary antigen	Bacteriology	Urine	Universal (white top)	Rapid test - Dipstick	24 hours	

LRTI investigations	Bacteriology	Bronchoalveolar lavage	Universal (white top)	Culture & sensitivities	12 days	Do not send specimens obtained after antibiotic therapy has been initiated or specimens which are largely salivary. Please request TB, fungal culture or virology if required.
		Sputum and associated specimens			4 days	
Mouth swabs	Bacteriology		Sigma Transwab (MW176S)	Culture & sensitivities	4 days	Collect specimens before starting antimicrobial therapy where possible. To assure the preconditions of the sampling for oral infections are comparable it is advised that patients should not: 1) eat or drink within 2 hours; 2) brush their teeth within 2 hours; 3) use any mouth rinse of disinfectant within 2 hours prior to sampling. If possible, samples should be taken in the morning under fasting conditions.
MSSA infection screen & MSSA screening (Renal/Spinal)	Bacteriology	Nose/groin, others as protocol	Swabs - Single Sigma Transwab MW176S or double Sigma Transwab MW167S	Culture & sensitivities	3 days	Only available for specific departments and covers MRSA.
		CSU	Sterile Boricon universal			
		Sputum and Fluids	Universal (white top)			
MRSA	Bacteriology	Nose/groin, others as protocol	Swabs - Single Sigma Transwab MW176S or double Sigma Transwab MW167S	Culture & sensitivities	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).
		CSU	Sterile Boricon universal			
		Sputum and Fluids	Universal (white top)			
Mycology – 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.
Mycology – Nail clippings	Bacteriology	Nail	Mycology collection kit		15 days	Several small parings are preferred to one large sample. Please request kit from the laboratory.

Mycology – 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.
Nose Swab	Bacteriology		Sigma Transwab (MW176S)	Culture & sensitivities	4 days	Use Infection Screen request for MRSA, SA (Renal), MRC, or VRE screen.
Penile Swab	Bacteriology		Sigma Transwab (MW176S)	Culture & sensitivities	4 days	Use Urethral swab for STD screen.
Peritoneal dialysis fluid for MC&S	Bacteriology		Universal (white top)	Microscopy, culture & sensitivities	8 days	
Pus for MC&S	Bacteriology		Universal (white top)	Culture & sensitivities	10 days	Please request TB culture if required, with relevant clinical details.
Respiratory CF	Bacteriology	Sputum and associated specimens	Universal (white top)	Culture & sensitivities	5 days	
Skin & Superficial site swabs	Bacteriology	Skin swab - state site	Sigma Transwab MW176S	Culture & sensitivities	4 days	Use for MCS on superficial sites. For deeper sites please use Wound for MCS.
TB	Bacteriology	Sputum/Pus/ Tissue NOT Swabs	White top universal	Direct microscopy	24 hours	
		Early morning urine (EMU)	Large volume urine container	Culture	70 days	Send 3 entire early morning urines (when urine is most concentrated) taken on 3 consecutive days. Large volume urine containers are available from Pathology consumables on request.
Throat swabs	Bacteriology		Sigma Transwab (MW176S)	Culture & sensitivities	4 days	
Tips for MC&S	Bacteriology	Cut tips to size to fit comfortably in universal container	Universal (white top)	Culture & 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.
Tissues & Biopsies	Bacteriology		Universal (white top)	Culture & sensitivities	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.

Tracheal aspirate for MC&S	Bacteriology	Tracheal aspirate	Universal (white top)	Culture & sensitivities	4 days	Please request TB culture if required.
Urethral swab	Bacteriology	Male/female urethral	Sigma Transwab (ENT)	Culture & sensitivities	4 days	For STD screening.
Urine for MC&S	Bacteriology	Optimal urine volume 10mls	Olive top boric acid container	Culture & sensitivities	3 days	Cell analysis is performed by automated or manual microscopy and culture is performed depending on the cell count result and patient category. Urine >2mls received in a white top universal will be rejected for testing as insufficient fill volume increases boric acid concentration and my inhibit growth of some bacteria. It is the requesting doctor's responsibility to arrange for transport and provide notification to the laboratory of urgent specimens.
Wound swab	Bacteriology		Sigma Transwab (MW176S)	Culture & sensitivities	4 days	

Virology Testing Repertoire – Microbial Serology assays

Investigation	Dept.	Acceptable sample type	Sample container details	Test type	Turnaround time	Special instructions
Bordetella pertussis antibodies	Virology	Clotted blood sample	Gold top tube	IgG	5 days	NB: Samples should be taken 2 weeks after onset of paroxysmal coughing
Borrelia burgdorferi (Lyme) antibodies	Virology	Clotted blood sample	Gold top tube	IgG & IgM	4 days	
Chlamydia trachomatis antibodies	Virology	Clotted blood sample	Gold top tube	IgG	4 days	For investigation of female infertility only
Cytomegalovirus antibodies	Virology	Clotted blood sample	Gold top tube	IgG & IgM	4 days	IgG only for past infection status
Epstein Barr Virus antibodies	Virology	Clotted blood sample	Gold top tube	EBNA VCA IgG & IgM	4 days	VCA IgG only for past infection status
Helicobacter pylori antibodies	Virology	Clotted blood sample	Gold top tube	IgG	4 days	

Hepatitis A antibodies	Virology	Clotted blood sample	Gold top tube	IgG & IgM	3 days	IgG only for past infection or vaccination response status
Hepatitis B (diagnosis)	Virology	Clotted blood sample	Gold top tube	Antigen (HBsAg) screen & confirmation testing	3 days - screen	
					7 days - confirmation	Confirmation and marker tests are available for Hepatitis B
Hepatitis B (vaccine immunity)	Virology	Clotted blood sample	Gold top tube	Anti-HBs (Quantitative)	3 days	Test available for assessment of immunity post vaccination only
Hepatitis C	Virology	Clotted blood sample	Gold top tube	Total Ab screen & confirmation testing	3 days - screen	
					7 days - confirmation	
Hepatitis E	Virology	Clotted blood sample	Gold top tube	IgG & IgM	4 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 sample	Gold top tube	IgG	4 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 antibody/antigen	Virology	Clotted blood sample	Gold top tube	Total Ab/Ag	3 days - screen	Confirmation testing is available and will be performed on all reactive samples if appropriate.
				Confirmation testing	4 days - confirmation	
HTLV antibody	Virology	Clotted blood sample	Gold top tube	Total Ab screen	3 days	Please note this test does not distinguish between type 1 and 2.
Measles	Virology	Clotted blood sample	Gold top tube	IgG & IgM	4 days	IgG only for past infection or vaccination response status
Mumps	Virology	Clotted blood sample	Gold top tube	IgG only	4 days	
Parvovirus	Virology	Clotted blood sample	Gold top tube	IgG & IgM	4 days	
Rubella	Virology	Clotted blood sample	Gold top tube	IgG & IgM	4 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
Streptococcal serology (Anti-streptolysin O)	Virology	Clotted blood sample	Gold top tube		6 days	
Syphilis	Virology	Clotted blood sample	Gold top tube	Total Ab - screen	3 days - screen	The laboratory provides a screening service for the detection of antibodies

				Confirmation testing - IgG & IgM	4 days - confirmation	to Treponemal sp. The laboratory is also a reference laboratory for Treponemal serology and provides a confirmation service.
Toxoplasma	Virology	Clotted blood sample	Gold top tube	IgG & IgM	5 days	IgG only for past infection status
Varicella zoster	Virology	Clotted blood sample	Gold top tube	IgG only	3 days	

Virology Testing Repertoire – Molecular assays

Investigation	Dept.	Acceptable sample type	Sample container details	Test type	Turnaround time	Special instructions
Adenovirus - quantitative test	Virology	EDTA blood	Purple top EDTA tube	In house Molecular assay	3 days	
Adenovirus - qualitative test	Virology	Eye swabs	Red top Copan tube	In house Molecular assay	3 days	
		Respiratory samples	Red top Copan tube			
Bacterial vaginosis	Virology	Urethral swab, vaginal swabs, self- taken vulvo-vaginal swabs	Aptima Tubes - sample type specific (refer to guidance)	NAAT	3 days	
BK virus - quantitative test	Virology	EDTA blood (immune-compromised)	Purple top EDTA tube	In house Molecular assay	3 days	
		Urine	Universal (white top)			
CMV – quantitative test	Virology	EDTA blood	Purple top EDTA tube	In house Molecular assay	3 days	
CMV – qualitative test	Virology	Amniotic fluid, CSF, urine, eye fluid, bronchoalveolar lavage (BAL), sputum	Universal (white top)	In house Molecular assay	3 days	
		Tissue/biopsy			7 days	
CSF	Virology	CSF	Universal (white	In house	3 days	Routine meningitis/encephalitis testing set includes HSV, VZV, enterovirus.

			top)	Molecular assay		Immunocompromised patient may be tested for CMV, EBV, HHV6 in addition.
Chlamydia pneumoniae detection	Virology	Nose & throat swab	Flocked swabs in viral transport medium	Molecular assay	4 hours	BioFire FilmArray
C. trachomatis detection	Virology	Urine, urethral swab, vaginal swabs, self- taken vulvo-vaginal swabs	Aptima Tubes - sample type specific (refer to guidance)	NAAT	3 days	All swab and urine samples 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. These must also be received in the appropriate Aptima tube (see guidance in Appendix 5).
EBV – quantitative test	Virology	EDTA blood	Purple top EDTA tube	In house Molecular assay	3 days	
EBV – qualitative test	Virology	CSF, eye fluid	Universal (white top)	In house Molecular assay	3 days	
Enterovirus	Virology	CSF	Universal (white top)	In house Molecular assay	3 days	
		EDTA blood	Purple top EDTA tube			
		Faeces	Blue top universal with spoon			
		Throat swab, eye swab, vesicle fluid swab	Flocked swab in viral transport medium		4 days	
Eye swabs	Virology	Eye swab	Flocked swab in viral transport medium	In house Molecular assay - HSV, Adenovirus	4 days	
Gastroenteritis viruses - adenovirus, rotavirus, astrovirus and sapovirus	See Bacteriology	Faecal sample	Blue top universal with spoon	Molecular assay	2 days	Refer to Bacteriology repertoire: Gastro-intestinal bacterial & viral pathogens
Gastroenteritis - Norovirus	See Bacteriology	Faeces	Blue top universal with spoon	Molecular assay	2 days	Refer to Bacteriology repertoire: Gastro-intestinal bacterial & viral pathogens
Hepatitis B – quantitative test	Virology	EDTA blood	Purple top EDTA tube	Molecular assay	5 days	

Hepatitis C – quantitative test	Virology	Clotted blood	Gold top tube	Molecular assay	5 days	Plasma/Serum should be separated asap after collection ideally within 4 hours
		EDTA blood	Purple top EDTA tube			
Hepatitis C - genotyping	Virology	Clotted blood	Gold top tube	Molecular assay	14 days	This test requires a minimum of 1.3ml serum or plasma as a qualitative PCR is also performed to provide assurance that the sample does not contain inhibitors which may affect the genotype result
		EDTA blood	Purple top EDTA tube			
HHV6	Virology	EDTA blood	Purple top EDTA tube	In house Molecular assay	3 days	
		CSF	Universal (white top)			
HIV – quantitative test	Virology	EDTA blood	Purple top EDTA tube	Molecular assay	7 days	Plasma should be separated asap after collection ideally within 4 hours.
HSV 1 and 2	Virology	EDTA blood	Purple top EDTA tube	In house Molecular assay	3 days	
		CSF, vesicle fluid, eye fluid, bronchoalveolar lavage (BAL), sputum	Universal (white top)			
		Tissue/biopsy	Universal (white top)		7 days	
		Eye swabs and genital swabs	Flocked swab in viral transport medium		4 days	
LRTI investigations	Virology	Bronchoalveolar lavage (BAL) and associated specimens	Universal (white top)	Molecular assay	2 days	
Measles	Virology	Respiratory samples	Red top Copan tube	In house Molecular assay	3 days	
Mycoplasma pneumoniae detection	Virology	Nose & throat swab	Flocked swabs in viral transport medium	Molecular assay	4 hours	BioFire FilmArray
Mycoplasma genitalium detection	Virology	Genital samples	Aptima Tubes - sample type specific	NAAT	3 days	Swabs must be received in the appropriate Aptima tube (see guidance in Appendix 5).
N. gonorrhoeae	Virology	Urine, urethral swab,	Aptima Tubes -	NAAT	3 days	All swab and urine samples must be received in the appropriate Aptima tube.

detection		vaginal swabs, self-taken vulvo-vaginal swabs	sample type specific (refer to guidance)			The following sample types can be tested however they have not been validated by the manufacturer for use: eye swabs, rectal swabs, throat swabs. These must also be received in the appropriate Aptima tube (see guidance in Appendix 5).
Parvovirus	Virology	EDTA blood	Purple top EDTA tube	In house Molecular assay	3 days	
		Amniotic fluid	Universal (white top)			
		Tissue/biopsy	Universal (white top)		7 days	
Pertussis	Virology	Pernasal swab, throat swab, nasopharyngeal swab	Orange top minitip sigma transwab or red top/green top	Molecular assay	3 days	
Respiratory viruses	Virology	Nose & throat swabs, throat gargles, nasopharyngeal aspirates, sputum, bronchoalveolar lavage (BAL)	Flocked swabs in viral transport medium	Molecular assay	2 days	Tests include - influenza A and B, RSV, human metapneumovirus, adenovirus, parainfluenza viruses 1,2,3 & 4, rhinovirus, SARS-CoV-2
			Universal (white top)			
Trichomonas vaginalis detection	Virology	Urine, urethral swabs, vaginal swabs, self-taken vulvo-vaginal swabs	Aptima Tubes - sample type specific (refer to guidance)	NAAT	3 days	Swabs must be received in the appropriate Aptima tube (see guidance in Appendix 5).
VZV	Virology	CSF, blood, lesion/vesicle fluid, eye fluid	Universal (white top)	In house Molecular assay	3 days	
		Lesion/vesicle fluid swab	Flocked swab in viral transport medium		4 days	

Appendix 3 – Clinical Details

Abbreviations:
(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	
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
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 or nasopharyngeal swab or nose and throat swab) for polymerase chain reaction (PCR) for respiratory virus testing set to include RSV, influenza A and B, parainfluenza viruses, adenovirus, human metapneumovirus 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	

Clinical Diagnosis	Preferred Specimen (s)	Notes
Chickenpox (Varicella)	Vesicle fluid or swab in VTM for PCR. Antibody testing of limited value.	Discuss with a medical virologist if swabbing cannot be done
Chlamydia		
a) Respiratory infection	Viral throat swab for detection of chlamydia pneumoniae by PCR	*Chlamydia pneumoniae* PCR is only available as part of an extended respiratory pathogen PCR panel typically only done in the context of severe respiratory disease. *Chlamydia psittaci* (psittacosis) is an uncommon and potentially severe pneumonia that can only be investigated through specialist diagnostics performed in an external laboratory - please discuss with microbiology.
b) Genital infection - Male	Either first voided urine clearly labelled for chlamydia or a urethral swab using a specific chlamydia NAAT collection kit	
c) Genital infection - Female	Self-taken vaginal, clinician-taken vulvo-vaginal swab or endocervical swab or using a specific Aptima 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.	
d) 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	
	If Chlamydia/gonorrhoea are suspected, 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	
COVID	Nasopharyngeal aspirate, nose and throat swabs for PCR	Consider other respiratory tract viruses
	BAL	
	ET secretions	
Coxsackievirus infection (Enterovirus)	See Enterovirus infection	

Clinical Diagnosis	Preferred Specimen (s)	Notes
Cryptococcosis	Biopsy	Consult a medical microbiologist
	CSF	
	Blood (PCB) specimen for antigen detection	
Cytomegalovirus	Clotted blood for CMV IgM/ IgG (PCB)	Serology is the standard test for uncomplicated suspected CMV infection. DO NOT request CMV IgG avidity as an initial test; CMV IgG avidity will be added by the laboratory when necessary.
	EDTA blood is required for CMV DNA detection	EDTA blood is required to determine a CMV DNA viral load- this test is done predominantly to investigate possible CMV disease in an immunocompromised person, or to monitor antiviral therapy response. CMV DNA detection can also be done on certain tissue samples, for example, colonic biopsy, to investigate CMV colitis contact virology if uncertain about this. CMV DNA testing of CSF is available for suspected neurological disease, typically in immunocompromised people, and is not recommended as part of a routine investigation of meningoencephalitis. BAL and sputum can be tested for CMV DNA as part of investigation for CMV pneumonitis. When testing samples other than EDTA blood it is helpful to obtain a contemporaneous EDTA blood to help interpret the findings in conjunction (example- if a CSF is blood stained it is useful to know if peripheral blood is CMV DNA positive)
	CSF, eye fluid, BAL, sputum may also be processed	
Cytomegalovirus - congenital	Plain urine in a 30mL sterile container	Two independent urines taken as soon as possible after birth, but no later than in the first three weeks of life, to investigate congenital infection. Additional samples are also helpful in some cases, for example, CSF, EDTA blood. Discuss with a virologist or paediatric infectious diseases specialist if considering antiviral therapy.
	EDTA blood	Obtain current blood sample from the mother for CMV IgG and IgM testing if congenital infection is suspected. When infection is suspected in-utero, amniotic fluid or fetal EDTA blood can be tested for CMV DNA.
Diarrhoea	Faeces - 3 specimens – do not send more than one specimen per day (Faecal specimens need to be obtained as soon as possible after the onset of	If an outbreak is suspected, contact medical microbiologist/virologist. Inform Heath Protection Team (HPT). Indicate any suspect food, travel abroad etc. on the request form and the occupation if relevant e.g. food handler, farmer etc.

Clinical Diagnosis	Preferred Specimen (s)	Notes
	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 HPT immediately. Details of immunisation history and foreign travel essential.
	Swab of tropical ulcer or skin lesion	
Echovirus infection (Enterovirus)	See Enterovirus infection	
Eczema	Swab of skin lesion	
	Swab in VTM for HSV, VZV and Enterovirus PCR if eczema herpeticum/coxsaclieum is suspected	
Encephalitis	CSF	Discuss complex settings with a medical virologist. Blood for serology (PCB) may be valuable in some cases.
	Faeces for enterovirus PCR	
	Throat swab in VTM for respiratory virus and enterovirus PCR	
Endocarditis	3 sets of blood cultures taken at least an hour apart over a period of 24 hours. If patient is 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
	Blood (PCB) for Q Fever and fungal serology if indicated	Bartonella and *C. psittaci* serology not available
	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 the Health Protection Team (HPT)
Enterovirus infection	Faeces for enterovirus PCR	Consult a medical virologist if infection suspected in SCBU EDTA blood for enterovirus PCR can be helpful in some settings.
	Throat swab in VTM for enterovirus PCR	
	CSF from patients with meningitis	
Food poisoning	Faeces	Consult medical microbiologist and inform Heath Protection Team (HPT) Faecal specimens should be obtained as soon as possible after the onset of symptoms especially if viral diarrhoea Clearance specimens not normally required
	Vomit may be processed for Norovirus	

Clinical Diagnosis	Preferred Specimen (s)	Notes
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 EBV serology	EBV specific antibody tests are performed in virology. Also consider CMV, HIV and syphilis serology.
Gonorrhoea	Swabs or urine for NAAT	Refer to national guidance for preferred sample type. 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 (enterovirus)	Faeces, vesicle fluid or throat swab in VTM for enterovirus PCR	Consider chickenpox if clinical diagnosis is uncertain.
Hepatitis (undiagnosed)	Blood (PCB) for antibody and antigen tests	
Hepatitis A, B, C, E	Blood (PCB)	Hepatitis A IgM may not be detectable in the first week of the illness. Acute or chronic hepatitis B is investigated by requesting hepatitis B surface antigen (HBsAg). Do not request hepatitis B core IgM testing alone. Hepatitis C antibodies may not be detectable for up to 3 months after the date of infection. Indicate if the person is immunocompromised as HCV RNA (viral load) testing is required for suspected HCV infection. Hepatitis C genotyping requires 1.3mL serum. Hepatitis Delta (HDV) testing is performed externally. This test is only valid on individuals who are known to be HBV infected. HEV PCR is required if suspecting acute HEV in an immunocompromised person or if investigating chronic hepatitis E.
	EDTA blood is required for HBV and HCV viral load testing	
Herpes simplex	Swab from the base of a lesion in VTM	CSF, blood, eye fluid and tissue samples can also be tested
HIV	Blood (PCB) for HIV antigen/antibody test	
	EDTA blood if HIV viral load or antiretroviral resistance testing required	
Hydatid disease	Blood (PCB) for antibody test	
Influenza	Throat swab in VTM for PCR	The current PCR test detects influenza A (seasonal H3N2, H1N1 pandemic 2009

Clinical Diagnosis	Preferred Specimen (s)	Notes
	Nasopharyngeal aspirate	and influenza B. Avian influenza testing is a specialist test which must be discussed with virology in advance. Serology is no longer available
	Nose swab, sputum, BAL also processed	
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 medical microbiologist
Listeriosis	Blood cultures	Consult a medical 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 (LGV)	Lesion/rectal swab for Chlamydia NAAT swab	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) NB. Consider the possibility of Viral Haemorrhagic Fever	Send specimens to Haematologist urgently. Consult medical 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.
Measles (acute)	Throat swab in VTM	Contact the Heath Protection Team (HPT) to obtain a salivary testing kit
	PCB for serology (IgG, IgM)	
Measles (immunity)	PCB for serology (IgG)	
Meningitis	CSF	Discuss all suspect cases of meningitis with a medical microbiologist If bacterial meningitis, inform Health Protection Team (HPT)
	Blood culture	
	Throat swab for bacterial culture from the patient	
	Blood (PCB) or EDTA blood for PCR	
Meningitis (Viral)	CSF and throat swab, faeces	Standard CSF testing set includes HSV, VZV, enterovirus. Throat swab and faeces are tested for enterovirus.
MERS	**DO NOT TAKE OR SEND SPECIMENS BEFORE CONSULTING A MEDICAL MICROBIOLOGIST/VIROLOGIST& INFECTION CONTROL**	Inform Heath Protection Team (HPT) immediately the diagnosis is suspected

Clinical Diagnosis	Preferred Specimen (s)	Notes
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.
	PCB for serology	
Myocarditis	Throat swab in VTM	Samples sets for myocarditis include a throat swab for respiratory virus detection, blood for serology (CMV, EBV, parvovirus, HIV); additional samples and tests according to clinical features
	PCB for serology	
Myositis	Faeces for enterovirus and adenovirus PCR	
	Paired (PCB) for serology	
Nocardiosis	Pus, tissue, for culture	
Non-indigenous mycoses: - Coccidioides - Histoplasmosis - Paracoccidioides - Blastomyces	Blood (PCB)	**Please discuss with Mycologist before sending specimens**
	Other specimens may be indicated	
Orf		Discuss with virologist
Osteomyelitis	Blood cultures	
	Deep operative specimens for culture	
	Blood (PCB) for Anti-streptolysin (ASO) test is sometimes helpful	
	Consider serial CRP measurements	
Otitis Media	Ear swab (Sigma Transwab)	
Parvovirus B19 (Erythrovirus)	Blood (PCB) for antibody test (and EDTA blood for PCR if immunocompromised).	Must give date of onset and clinical details supporting diagnosis e.g. rash, arthritis, hydrops foetalis. Amniotic fluid can also be tested for Parvovirus B19.
Pelvic inflammatory disease	Combined HVS/Endocervical Sigma Transwab for gonococcal or other bacterial infection. Triple swabs (HVS, endocervical, urethral) also acceptable.	HVS are unsuitable for the diagnosis of gonorrhoea culture but useful for NAAT
	Endocervical and/ or vulvo-vaginal swab for Chlamydia/gonorrhoea NAAT	
Pneumonia	Blood cultures	Please give date of onset
	Purulent sputum for culture	Consider viral aetiology (send respiratory tract samples for PCR)
	Urine for legionella antigen detection	
	BAL may be indicated but is essential if aspergillosis is suspected	
Poliomyelitis	CSF, Faeces	Consult a virologist and inform Heath Protection Team (HPT)
	Throat swab in VTM	Please note that currently used polio vaccines do not contain live virus

Clinical Diagnosis	Preferred Specimen (s)	Notes
Pseudomembranous colitis	Faeces for *Clostridioides difficile* toxin. Specimen should be liquid or take shape of the collecting container	Clearance specimens are not required
Psittacosis	Sputum or throat swab for PCR	Specialist test, discuss with microbiology
Puerperal Fever	Blood cultures.	
	High vaginal swabs	
	Urine	
Pyrexia of unknown origin	Blood cultures	Discuss with a medical 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	
Rabies	**DO NOT TAKE OR SEND SPECIMENS BEFORE CONSULTING A MEDICAL MICROBIOLOGIST OR VIROLOGIST**	Inform Heath Protection Team (HPT) immediately the diagnosis is suspected
Respiratory syncytial virus (RSV)	Nose & throat swabs for PCR, nasopharyngeal aspirate	Cause of bronchiolitis
	BAL	
	Sputum	
Respiratory tract infection (upper)	Nose & throat swabs for PCR, nasopharyngeal aspirate	Respiratory viruses including SARS-CoV-2, influenza A, influenza B, RSV, adenovirus, human metapneumovirus, parainfluenza 1-4, rhinovirus
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 Heath Protection Team (HPT) immediately if the diagnosis is suspected
Schistosomiasis	Urine - 3 complete specimens of urine in 150mL containers taken between 1000h - 1400h	Please discuss – depends on geographical risk

Clinical Diagnosis	Preferred Specimen (s)	Notes
	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)	N.B. If meningococcus is suspected, send an EDTA blood for PCR and inform Heath Protection Team (HPT)
	Urine	
	Relevant specimens from presumed primary focus if available	
Shingles	Vesicle fluid or swab in VTM for VZV PCR	Discuss complex cases with a virologist. Serology is typically not helpful.
Spontaneous Bacterial Peritonitis (SBP)	Ascitic fluid in plain sterile, leakproof container	Cell count and differential will only be performed if clinical details state SBP
	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; samples in Aptima kit for NAAT	
Trypanosomiasis	2.5 ml blood in EDTA	Consult a medical microbiologist.
	Blood (PCB) for antibody test	
Tuberculosis (TB)		
	3 consecutive daily early morning specimens or sputum for AAFB	

Clinical Diagnosis	Preferred Specimen (s)	Notes
a) Respiratory	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 Pathology consumables on request
c) Other sites	Consult a medical 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 HSV, syphilis or LGV	
Urethritis	Aptima swab for chlamydia /gonorrhoea 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 (*Bordetella pertussis*)	ENT Sigma Transwab, Throat swab in VTM for pertussis PCR or respiratory pathogen PCR	Pernasal swabs are the most reliable way of making the diagnosis of whooping cough. PCR on pernasal swabs or nasopharyngeal aspirates is available for the diagnosis of *Bordetella sp.* infection.
	Blood (PCB) for serology	Pertussis serology is usually more useful in adults presenting with a prolonged cough.
Worms/ Faecal Parasites e.g. Ascaris (roundworm), Anclostoma 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 (threadworm)	Send a rectal suspension kit	Faeces will NOT be processed
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 are not given as individual reference laboratories TATs are outside of the Bristol Infection Sciences laboratory's control.

Referred Test	Reference Laboratory	Sample Type	Accreditation
16S sequencing	UKHSA Bacterial Reference Dept. Colindale	Pure culture	8197
Acanthamoeba	LSHTM (London School of Hygiene and Tropical Medicine)		9148
Acyclovir (VZ) resistance	GOSH (Great Ormond Street Hospital)	Isolates, primary swabs in VTM or saline, DNA	8675
Adenovirus typing	UKHSA Virus Reference Laboratory, Colindale	Fluid from respiratory secretions, nose and throat swabs	8825
Amoebiasis	Clinical Parasitology Dept, The Hospital for Tropical Diseases		
Amoebic serology for invasive disease	LSHTM (London School of Hygiene and Tropical Medicine)		
Amp C resistance	UKHSA Bacterial Reference Dept. Colindale		8197
Anaerobe ID	Anaerobic Reference Laboratory, Public Health Wales	Pure culture	9510
Anaplasma (Ehrlichia) PCR	Rare & Imported Pathogens Laboratory, UKHSA Porton Down	Serum, plasma	9304
Anaplasma phagocytopilum IgG	Rare & Imported Pathogens Laboratory, UKHSA Porton Down	Serum	9304
Anti-HBc avidity & IgM	UKHSA Virus Reference Laboratory, Colindale	Serum, plasma, dried blood spot, oral fluid	8825
Anti-HBe serology	UKHSA Virus Reference Laboratory, Colindale	Serum, plasma	8825
Avian Influenza	UKHSA Birmingham		
Babesia IFAT	HTD (Hospital for Tropical Diseases), University College London		
Bacillus anthracis	Rare & Imported Pathogens Laboratory, UKHSA Porton Down	Plasma, tissue biopsy, post-mortem tissue, eschar, lesion washings, suspect colonies	9304
Bacterial identification	UKHSA Bacterial Reference Dept. Colindale	Pure culture	8197
Bacterial MICs	UKHSA Bacterial Reference Dept. Colindale	Pure culture	8197
Bacterial PCR-sequencing: GAS/PN/STAUR	GOSH (Great Ormond St Hospital)		8675

Referred Test	Reference Laboratory	Sample Type	Accreditation
Bacterial typing	UKHSA Bacterial Reference Dept. Colindale	Pure culture	8197
Bordetella pertussis PCR (confirmation)	UKHSA Bacterial Reference Dept. Colindale	Pure culture	8197
Brucella serology	BRU (Brucella Reference Unit), Liverpool Clinical Laboratories	Serum	9755
Burkholderia spp. ID / typing / MIC	UKHSA Bacterial Reference Dept. Colindale	Pure culture	8197
C. botulinum ID / toxin detection	UKHSA Bacterial Reference Dept. Colindale	Clinical specimen	8197
C. perfringens ID / toxin detection	UKHSA Bacterial Reference Dept. Colindale	Faeces or pure culture	8197
C. tetani ID / toxin detection	UKHSA Bacterial Reference Dept. Colindale	Serum	8197
Campylobacter ID / typing / resistance screening	UKHSA Bacterial Reference Dept. Colindale	Pure culture	8197
Campylobacter serology	Preston Microbiology Services		8545
Carbapenem resistance	UKHSA Bacterial Reference Dept. Colindale	Pure culture	8197
Chikungunya IgG / IgM / PCR	Rare & Imported Pathogens Laboratory, UKHSA Porton Down	Serum, plasma	9304
Chlamydia ID / PCR / MIC	UKHSA Birmingham		8213
Chlamydia PCR	UKHSA Bacterial Reference Dept. Colindale	Respiratory sample	8197
Chlamydia LGV	UKHSA Virus Reference Laboratory, Colindale	Confirmed *C. trachomatis* positive clinical specimen: minimum of 500µL residual NAAT swab transport medium, or a fresh dry swab (swabs from men only)	8825
CJD & CJD genetic marker (14-3-3)	CJD Surveillance Unit, Edinburgh		
C. difficile	Anaerobic Reference Laboratory, Public Health Wales	Pure culture	9510
CMV PCR Guthrie card	HSL (Analytics), The Doctors Laboratory, University College London Hospitals and Royal Free London	Guthrie card / dried blood spot	8059
CMV resistance – viral load	UKHSA Manchester	EDTA blood	10175
CMV sequencing	UKHSA Birmingham		8213
Coronavirus PCR	UKHSA Virus Reference Laboratory, Colindale	Fluid from respiratory secretions, nose and throat swabs. Other samples such as serum/plasma, CSF and oral fluid by prior arrangement	8825

Referred Test	Reference Laboratory	Sample Type	Accreditation
Coxiella (Q fever) IgG / IgM / IgA / PCR	Rare & Imported Pathogens Laboratory, UKHSA Porton Down	Serum, plasma, tissue (heart valve for PCR)	9304
Crimea-Congo Haemorrhagic Fever PCR	Rare & Imported Pathogens Laboratory, UKHSA Porton Down	Serum, plasma, urine	9304
Cryptosporidium detection / typing / subtyping	Cryptosporidium Reference Unit, Swansea	Faeces	9510
Cyst fluid parasitology	HTD (Hospital for Tropical Diseases), University College London	Cyst fluid	
Cysticercosis immunoblot	HTD (Hospital for Tropical Diseases), University College London	Serum, CSF	
Dengue IgG / IgM / PCR	Rare & Imported Pathogens Laboratory, UKHSA Porton Down	Serum (plasma for PCR)	9304
Diphtheria (immunisation response)	UKHSA Manchester	Clotted blood / serum, paired sera	10175
Dried blood spot	UKHSA Manchester	Dried blood spot card	10175
E. Coli ID / typing / Shiga toxin	UKHSA Bacterial Reference Dept. Colindale	Pure culture	8197
Ebola PCR	Rare & Imported Pathogens Laboratory, UKHSA Porton Down	Serum, plasma, urine, semen	9304
Echinococcus serology	HTD (Hospital for Tropical Diseases), University College London		
Electron Microscopy for the visualisation of viruses	UKHSA Virus Reference Laboratory, Colindale	Smears of vesicle fluid dried onto a microscopy slide, piece of crust or biopsy of a lesion	8825
Entamoeba histolytica	HTD (Hospital for Tropical Diseases), University College London		
Enterovirus characterisation	UKHSA Virus Reference Laboratory, Colindale	Faeces, CSF, throat swab, respiratory secretions. Other samples by arrangement	8825
Extended toxin detection	UKHSA Bacterial Reference Dept. Colindale	Pure culture	8197
Fasciola IFAT	HTD (Hospital for Tropical Diseases), University College London	Serum	
Filaria serology	HTD (Hospital for Tropical Diseases), University College London	Citrate blood	
Francisella tularensis IgG / IgM / IgA / PCR	Rare & Imported Pathogens Laboratory, UKHSA Porton Down	Serum, plasma, (tissue, wound swab, suspect colonies for PCR)	9304
Ganciclovir and Foscarnet resistance	UKHSA Manchester	EDTA blood	10175
Haemophilus ID / MIC / typing	UKHSA Bacterial Reference Dept. Colindale	Pure culture	8197
Haemophilus PCR	Oxford Laboratory		

Referred Test	Reference Laboratory	Sample Type	Accreditation
Haemophilus immune response	UKHSA Manchester	Clotted blood or serum	10175
Hantavirus IgG	Rare & Imported Pathogens Laboratory, UKHSA Porton Down	Serum, plasma	9304
Hepatitis A investigations	UKHSA Virus Reference Laboratory, Colindale	Serum, plasma	8825
HBeAg serology	UKHSA Virus Reference Laboratory, Colindale	Serum, plasma	8825
HBV DNA sequence analysis	UKHSA Virus Reference Laboratory, Colindale	EDTA plasma	8825
HBV sequencing	UKHSA Birmingham		8213
HCV resistance	HSL (Analytics), The Doctors Laboratory, University College London Hospitals and Royal Free London	Blood (EDTA)	
Hepatitis D PCR	UKHSA Virus Reference Laboratory, Colindale	EDTA plasma	8825
Hepatitis D serology	UKHSA Virus Reference Laboratory, Colindale	Serum, plasma	8825
Helicobacter ID / MIC	UKHSA Bacterial Reference Dept. Colindale	Heavy suspension of isolate or gastric biopsies	8197
Hepatitis E PCR	UKHSA Virus Reference Laboratory, Colindale	Serum, plasma, faeces	8825
HHV6 typing	UKHSA Virus Reference Laboratory, Colindale	CSF, serum, plasma, whole blood	8825
HHV7 PCR	UKHSA Virus Reference Laboratory, Colindale	CSF, serum, plasma, whole blood	8825
HHV8 PCR	UKHSA Virus Reference Laboratory, Colindale	Unseparated blood on EDTA. Other samples by prior arrangement	8825
HIV PCR amplification (IRR) HIV RT-sequencing (IRR)	UKHSA Birmingham		8213
HIV viral load HIV-1 genotyping	UKHSA Birmingham		8213
HIV-1 incidence test	UKHSA Virus Reference Laboratory, Colindale	EDTA plasma	8825
HIV resistance	UKHSA Birmingham		8213
HIV-2 viral load	University College London Hospitals		
Hookworm parasites	HSL (Analytics), The Doctors Laboratory, University College London Hospitals and Royal Free London	Faeces	9702

Referred Test	Reference Laboratory	Sample Type	Accreditation
HSV IgG serology	UKHSA Virus Reference Laboratory, Colindale	Paired sera and CSF	8825
HSV type specific serology	University Hospital Southampton NHS Foundation Trust	Serum	8403
HTLV	UKHSA Virus Reference Laboratory, Colindale	Serum, plasma	8825
Hydatid serology	HTD (Hospital for Tropical Diseases), University College London	Serum, CSF	
IL-28B genotyping	HSL (Analytics), The Doctors Laboratory, University College London Hospitals and Royal Free London		
Japanese encephalitis IgG / PCR	Rare and Imported Pathogens Laboratory UKHSA Porton Down	Serum, plasma, CSF (accompanied by serum)	9304
JC PCR / antibody	UKHSA Virus Reference Laboratory, Colindale	CSF, urine, tissue, serum, plasma, whole blood	8825
Lassa PCR	Rare and Imported Pathogens Laboratory UKHSA Porton Down	Serum, plasma, urine, throat swab	9304
Leishmania PCR	Liverpool School of Tropical Medicine		
Leishmaniasis serology	HTD (Hospital for Tropical Diseases), University College London	Serum	
Legionella ID / confirmation / typing / PCR	UKHSA Bacterial Reference Dept. Colindale	Lower respiratory tract samples	8197
L. pneumophila (Sgp 1) serology	UKHSA Bacterial Reference Dept. Colindale	Serum	8197
L. pneumophila urinary antigen	UKHSA Bacterial Reference Dept. Colindale	Urine	8197
Leptospira IgM / PCR	Rare and Imported Pathogens Laboratory UKHSA Porton Down	Serum, plasma, (urine, CSF for PCR)	9304
Linezolid resistance	UKHSA Bacterial Reference Dept. Colindale	Pure culture	8197
Listeria ID / typing	UKHSA Bacterial Reference Dept. Colindale	Pure culture	8197
Lyme PCR	Rare and Imported Pathogens Laboratory UKHSA Porton Down	Plasma, joint fluid, tissue biopsy, CSF	9304
Malaria	HTD (Hospital for Tropical Diseases), University College London	EDTA blood	
Marburg PCR	Rare and Imported Pathogens Laboratory UKHSA Porton Down	Serum, plasma	9304
Measles avidity / IgM / PCR	UKHSA Virus Reference Laboratory, Colindale		8825
MecA PCR	UKHSA Bacterial Reference Dept. Colindale	Pure culture	8197
Meningococcal PCR / typing	Meningococcal Reference Unit UKHSA Manchester	Whole blood (EDTA), coagulated whole blood, CSF, serum,	10175

Referred Test	Reference Laboratory	Sample Type	Accreditation
		plasma, joint fluids	
Mumps IgM	UKHSA Birmingham		8213
Mumps PCR / serology	UKHSA Virus Reference Laboratory, Colindale	Oral fluid, throat swabs, NPA, urine, CSF	8825
Mycobacteria ID / MIC / typing / fastrack PCR	UKHSA National Mycobacterial Reference Service South, Colindale	Pure culture	10080
Mycoplasma genitalium ID / MIC / PCR	UKHSA Bacterial Reference Dept. Colindale	Residual specimen from unprocessed NAAT swab, fresh dry swab, extracted DNA	8197
Mycoplasma pneumoniae PCR	UKHSA Bacterial Reference Dept. Colindale	Respiratory sample	8197
Mycoplasma / Ureaplasma ID	UKHSA Bacterial Reference Dept. Colindale	Respiratory, CSF, joint and wound aspirates	8197
N. gonorrhoeae ID / MIC / PCR	UKHSA Bacterial Reference Dept. Colindale	Pure culture	8197
Neuroimmunology: transferrin glycoforms	University College London Hospitals	Serum	8045
Norovirus genotyping	UKHSA Virus Reference Laboratory, Colindale	Faeces	8825
Orientia tsutsugamushi PCR	Rare and Imported Pathogens Laboratory UKHSA Porton Down	Serum, plasma, eschar biopsy, CSF	9304
Parechovirus PCR	UKHSA Birmingham		8213
Parvovirus B19 PCR	UKHSA Virus Reference Laboratory, Colindale	Serum, plasma, amniotic fluid, placenta, foetal tissue	8825
Pneumococcal antibodies / antigen / PCR	Pneumococcal Reference Unit UKHSA Manchester	EDTA blood, CSF, pleural fluid, DNA extracts	10175
Polio serology	UKHSA Virus Reference Laboratory, Colindale	Serum	8825
PVL toxin testing or toxin gene detection	UKHSA Bacterial Reference Dept. Colindale	Pure culture	8197
Pyrazinamide	Cardiff Toxicology Laboratories	EDTA plasma	8989
Rabies antibodies	Animal and Plant Health Agency (Vet labs, Weybridge)	Serum	1769
Resistance mechanisms	UKHSA Bacterial Reference Dept. Colindale	Pure culture	8197
Rickettsia – Epidemic Typhus IgM / IgG	Rare and Imported Pathogens Laboratory UKHSA Porton Down	Serum	9304
Rickettsia PCR	Rare and Imported Pathogens Laboratory UKHSA Porton Down	Serum, plasma, eschar biopsy, CSF, swab	9304

Referred Test	Reference Laboratory	Sample Type	Accreditation
Rickettsia – Spotted Fever IgM / IgG	Rare and Imported Pathogens Laboratory UKHSA Porton Down	Serum	9304
Rotavirus genotyping	UKHSA Virus Reference Laboratory, Colindale	Faeces. Other samples by prior arrangement	8825
Rubella IgG / IgM / avidity	UKHSA Virus Reference Laboratory, Colindale	Serum, plasma, oral fluid	8825
Salmonella ID / MIC / typing	UKHSA Bacterial Reference Dept. Colindale	Pure culture	8197
Sandfly Fever IgG	Rare and Imported Pathogens Laboratory UKHSA Porton Down	Serum	9304
Schistosomiasis serology (Bilharzia)	HTD (Hospital for Tropical Diseases), University College London	Serum	
Shigella ID / typing	UKHSA Bacterial Reference Dept. Colindale	Pure culture	8197
Staphylococcus (MRSA) toxin typing	UKHSA Bacterial Reference Dept. Colindale	Pure culture	8197
Streptococcus ID / MIC / typing	UKHSA Bacterial Reference Dept. Colindale	Pure culture	8197
S. pneumoniae ID / MIC / typing	UKHSA Bacterial Reference Dept. Colindale	Pure culture	8197
Stronglyoides serology	HTD (Hospital for Tropical Diseases), University College London	Serum	
Taenia sp.	Liverpool School of Tropical Medicine		9362
TB (nothing isolated) ID / MIC / typing / PCR	WCM (Wales Centre for Mycobacteria), Cardiff		9510
TB blood culture	WCM (Wales Centre for Mycobacteria), Cardiff		9510
Tetanus IgG anti-toxin level	UKHSA Manchester	Clotted blood or serum, paired sera	10175
Tick Borne Encephalitis IgG / PCR	Rare and Imported Pathogens Laboratory UKHSA Porton Down	Serum, plasma, CSF (accompanied by serum)	
Tick ID	Bristol University, FAO Dr Lee	Website: bristoluniversitytickid.uk	
Toxocara serology	HTD (Hospital for Tropical Diseases), University College London	Serum	
Toxoplasma confirmation / PCR	Toxoplasma Reference Unit, Swansea	EDTA blood, CSF, vitreous fluid, amniotic fluid, DNA extracts	9510
Trichinella serology	HTD (Hospital for Tropical Diseases), University College London	Serum	
Trypanosoma serology	HTD (Hospital for Tropical Diseases), University College London	Serum	

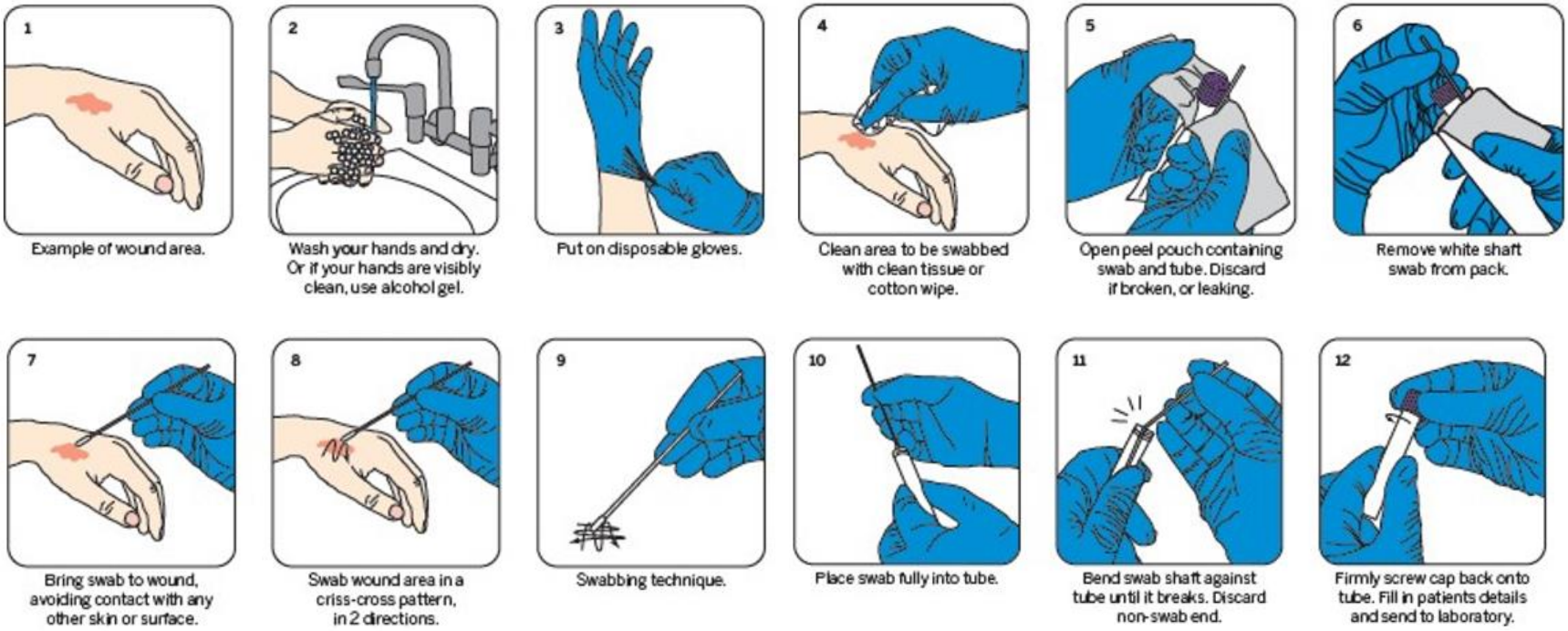
Referred Test	Reference Laboratory	Sample Type	Accreditation
Varicella zoster differentiation	GOSH (Great Ormond Street Hospital)	Isolates, primary swabs in VTM or saline, DNA extracts	8675
Varicella zoster serology	UKHSA Virus Reference Laboratory, Colindale	Serum	8825
West Nile IgG / IgM / PCR	Rare and Imported Pathogens Laboratory UKHSA Porton Down	Serum, plasma, CSF (accompanied by serum) (urine for PCR, not serum)	9304
Whipples PCR	GOSH (Great Ormond Street Hospital)	Duodenal biopsies, blood (EDTA), CSF	
Worm ID	LSHTM (London School of Hygiene and Tropical Medicine)		9148
Yellow Fever IgG / PCR	Rare and Imported Pathogens Laboratory UKHSA Porton Down	Serum, plasma, CSF (accompanied by serum) (tissue for PCR, not serum)	9304
Yersinia ID / typing	UKHSA Bacterial Reference Dept. Colindale	Pure culture	8197
Zika IgG / IgM / PCR	Rare and Imported Pathogens Laboratory UKHSA Porton Down	Serum, plasma, (urine, semen for PCR)	9304

Appendix 5 – Sample Collection

Procedure for wound/skin swab using Sigma Transwab

N.B. Please break swab on the line on the swab. The swab will then, as you tighten the lid, insert itself into the lid. In the laboratory the analyser will remove the lid and process the swab. If the swab is not broken as instructed, the swab may fail to be processed.

HOW TO GUIDE Routine and wound swab using the ∑-Transwab Single Pack



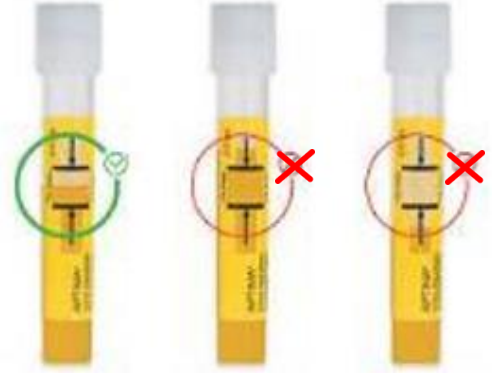
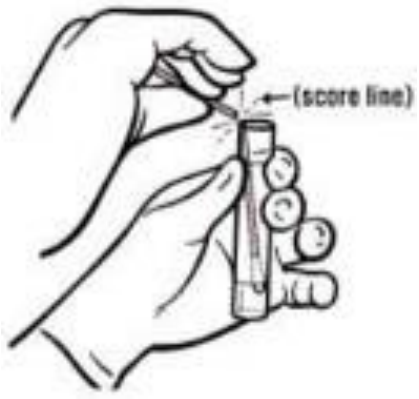
mwe

Medical Wire & Equipment Co. (Bath) Ltd, Corsham, Wiltshire, England, SN13 9RT
+44 (0)1225 810361 | mwe.co.uk

Procedure for DUO swabs for MRSA

N.B. Please break swab on the line on the swab. The swab will then, as you tighten the lid, insert itself into the lid. In the laboratory the analyser will remove the lid and process the swab. If the swab is not broken as instructed, the swab may fail to be processed.

Guidance on appropriate/inappropriate samples for Chlamydia/Gonorrhoea NAAT testing at Bristol Infection Sciences

Urine samples	Endocervical swabs	Multi-test swab
		
N.B. In addition to the sample type specific information above the following will also affect the validity of the sample for testing.		
Volume of sample must be correct Fill the container so that the liquid is between the two lines  **Accept** **Reject overfilled** **Reject underfilled** Samples showing above or below the black lines will be rejected.	**Correct collection swab must be use** The collection kit contains two swabs: 1. White – cleaning swab 2. Blue – sample swab   Sample containers received with the white cleaning swab will be rejected.	**Collection swab has a marked break point.** Place swab in tube & once sample has been taken, break off before attaching lid.   Samples received without the swab cleanly snapped off will be rejected.

Acceptance  criteria	Issue affecting the validity of the test	Rejection  criteria
In date sample container	Collection tubes have expiry dates – ensure sample container is within date prior to use	Sample container has passed its expiry date
Transport medium in tube	Collection tubes contain liquid – Do not remove this	No transport medium in sample container received
Swab in the correct direction	Swabs must be placed flocked end into the liquid	Swab inverted in collection tube
Sample lid sealed	Silver seal on cap must be intact and not damaged	Damaged/pierced silver seal

Sample containers NOT suitable for CT GC NAAT testing

There are a significant number of different types of sample collection and transport containers available, but samples collected in them cannot be tested on the Hologic Aptima system. Only specific collection tubes supplied for the Hologic Aptima system can be accepted by the laboratory for testing.

Below are some examples of different types of collection containers and swabs which are not suitable for Chlamydia/Gonorrhoea NAAT testing in the Bristol Infection Sciences Laboratory.

Universal white top container 	**Faecal sample collection pot (blue top universal with spoon)** 	**Urine sample boric acid container** 
Non-Aptima swab container 	**Viral swabs** 	**Bacterial culture swabs**