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Bristol Public Health Laboratory

MICROBIOLOGY USER MANUAL

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Amendment History

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When amended documents or individual pages are issued by the Quality Manager, or when temporary handwritten amendments are made it is the responsibility of the copyholder to update the document, discard previous versions and complete this amendment sheet which must be held with the controlled document.

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Amendment No	Date	Discard Page(s)	Old issue no.	Insert Page(s)	New issue no.	Section of SOP involved	Copyholders
1	Nov 2005	ALL	1.0	ALL	2.0	All – major review	Electronically to all users via UBHT & RUHT intranet and the internet + hard copy for JS & JW
2	Dec 2007	ALL	2.0	ALL	3.0	Major review	Electronically to all users via UBHT & RUHT intranet, and the internet + all PHE staff on file viewer V1, B1
3	March 2008	30 - 33	3.0	30 - 33	3.1	Updated antibiotic guidelines	Electronically to all users via UBHT & RUHT intranet, and the internet + all PHE staff on file viewer V1, B1
4	August 2008	30 - 33	3.0	30 - 33	3.2	Updated antibiotic guidelines	Electronically UBHT & RUHT intranet, internet, file viewer V1, B1
5	January 2010	All	3.2	All	4.0	Major revision, mainly virology	Electronically UHB & RUH intranet, internet, file viewer V1, B1
6	April 2010	All	4.0	All	4.1	Updated RUH transport info. Added referral lab addresses and TAT Updated telephone numbers	Electronically UHB & RUH intranet, internet, users of service, file viewer V1, B1, B8 (CD)

7	August 2011	All	4.1	All	4.2	Updated key staff & phone nos. Removed antibiotic guidelines and urinalysis algorithm and replaced with hyperlinks Additional information added for electronic ordering (ICE) Virology guidance reviewed and updated Mycology guidance reviewed and updated	Electronically UHB & RUH intranet, internet, users of service, file viewer V1, B1, B8 (CD)
8	August 2013	All	4.2	All	5.0	Reviewed and updated to PHE document. All sections reviewed and updated including: Contact details, internet references, testing guidance, notificatiable infections actions updated	Electronically UHB & RUH intranet, internet, users of service, file viewer V1, B1, B8 (CD)

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MISSION STATEMENT

Public Health England

"To protect and improve the nation's health and to address inequalities, working with national and local government, the NHS, industry, academia, the public and the voluntary and community sector."

Public Health England:

- works transparently, proactively providing government, local government, the NHS, MPs, industry, public health professionals and the public with evidence-based professional, scientific and delivery expertise and advice
- ensures there are effective arrangements in place nationally and locally for preparing, planning and responding to health protection concerns and emergencies, including the future impact of climate change
- supports local authorities, and through them clinical commissioning groups, by providing evidence and knowledge on local health needs, alongside practical and professional advice on what to do to improve health, and by taking action nationally where it makes sense to do so

USEFUL TELEPHONE NUMBERS

For full listing see Page 61

General PHE Enquiries **0117 342 5551**

This is our main automated switchboard number. Use this and then select the options given below to access the correct department.
Finalised results can be accessed in ICE, on VPLS or Ultra connect- please use these whenever possible.
Alternativley, results are available via phone between 1030h and 1200h and between 1400h – 1700h.

Option 1: Test results - then choose:
Option 1: Virology, serology & Chlamydia
Option 2: Bacteriology & *C. difficile*
Option 3: Fungal Infections

Option 2: Clinical Advice – then choose:
Option 1: Virology & serology
Option 2: Bacteriology
Option 3: Fungal Infections

For public health advice and advice on Meningitis and infectious disease notification please call 08455048668

Option 3: Food, Water & Environmental

Option 4: To speak to named staff member or all other enquiries: Hold & await reply

Urgent specimens laboratory notification:

Please use the Clinical results (Option 1) & appropriate departmental option as stated above to notify laboratory of urgent specimens

Stores/Supplies

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

Myrtle Road site	**0117 342 5040**
BRI site	**0117 342 2573**
RUH Site	**01225 82 4724**

INTRODUCTION

The Public Health England Bristol Laboratory is the Public Health Laboratory for the South West. It is one of the largest Microbiology laboratories in the UK, providing a clinical service for University Hospitals Bristol NHS Foundation Trust, (UHBristol) the Royal United Hospital Bath NHS Trust (RUHT) and for the many GP practices in the South Bristol and Bath areas.

The laboratory is accredited by the Clinical Pathology Accreditation (CPA) board, giving an assurance of quality. It is located over three different sites:

The Myrtle Road site houses the **Virology department**, which provides a clinical Virology service to UHBristol and RUHT. The laboratory also supplies a clinical service for the North Bristol Hospitals and Weston Area Health Trust and receives specimens from many other hospitals across the South West and the UK. The laboratory provides both regional and national specialist tests and Mycology reference services, and has an international reputation for excellence.

The PHE supports several reference laboratories nationally, one of which is located at Myrtle Road. **The Mycology Reference Laboratory** (MRL) provides a comprehensive local and national service for the diagnosis and management of fungal infection, including the isolation and identification of yeasts and moulds, together with a susceptibility testing service and an anti-fungal drug assay service. It also houses the National Collection of Pathogenic Fungi (NCPF).

The Laboratory also receives foods, 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, Myrtle Road houses the administrative department, and provides the base for the laboratory transport and supplies.

The Bristol Royal Infirmary site houses the **Clinical Bacteriology Department** and the UHBristol Department of Infection Control on level 8 of the Queens Building, adjacent to other disciplines within the UHBristol Laboratory Medicine Department. The department accepts many hundreds of specimens daily for bacteriological investigation, and is able to offer clinical advice on all aspects of clinical Bacteriology and Parasitology, including advice on antibiotic treatment, control of infection, and emerging antibiotic-resistant organisms.

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 Bristol laboratories four times a day at 0900h, 1300h, 1500h and 1700h. Microbiology Consultants are also on site, who, with the other members of the team in Bath are able to offer a full clinical service, including control of infection.

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

NORMAL HOURS OF SERVICE

Both the BRI site and the Myrtle Road site have the following working hours:

Monday – Friday	**08.30h – 17.30h**
Saturday	**08.00h – 12.00h (Myrtle Road site - excluding Mycology)**
	08.00h – 13.00h (BRI Site - Bacteriology)
Sunday AM	**09.00h – 1230h (BRI site - Bacteriology only)**

The laboratory at RUH, Bath is open as follows:

Monday – Friday	**09.00h – 17.00h**
Saturday	**08.00h – 13.00h**

The majority of specimens arriving in the laboratory during these hours will normally be processed on the same day but a few may not be tested until the next working day. Specimens arriving outside of these times will be processed and tested on the following working day.
However a proportion of specimen types for virology are batched, and may be processed with the next batch of specimens.
(see below for weekend and Bank Holiday working)

URGENT REQUESTS

If results are required to assist with urgent clinical decisions, the laboratory must be notified by telephone, even during normal working hours. Without such notification the specimen will not be prioritised and will be processed with the routine batch. Please mark the request form (if used) as 'URGENT'. This is particularly important at the RUH site where specimens will be transported to the BRI 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 be contacted and informed that the sample is being sent and urgent testing is required. Please mark the bag containing the sample to indicate that the sample is urgent using the "urgent ICE label". Labels can be obtained by contacting Virology stores (ext 25041) or Bacteriology prep room (ext 22573).

OUT-OF-HOURS SERVICES

The laboratory offers 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.
On-call BMS or medical microbiologist contact details:

- Bacteriology, BRI site - via the BRI switchboard Tel No: 0117 923 0000
- Bacteriology, RUH site - via the RUH switchboard Tel No: 01225 428 331

Virology

The Consultants receive all out-of-hours requests prior to testing and will advise on test selection, give appropriate clinical advice and liaise with the duty biomedical scientist on call.

The Clinical Virologist can be contacted via the BRI Switchboard on 0117 9230000. Requests should be made by medical staff or senior nursing staff. Please note that not all tests undertaken during normal working hours are available on-call, or at weekends.

Public Holiday Arrangements

A small team of staff will work in the laboratory in the morning to read cultures, carry out certain molecular tests etc, from the day before. They are not available for routine work or enquiries but will provide an on-call service for urgent requests only. Please contact the Bacteriology department via BRI/RUH Switchboard as above and Virology on call Consultants via the BRI switchboard.

As only a limited team cover the laboratory during these holidays it is better not to submit bacteriology samples over the holiday weekend which could be up to 3 days old when processed on the next working day which could compromise the results. It is preferable to send freshly taken specimens on the day following the Public Holiday unless the samples are unrepeatable or the patient has already started antibiotics.

SPECIMEN COLLECTION – GENERAL GUIDELINES

Consent for testing

Requesting a specific test implies patient consent has been obtained by the requesting clinician. 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 or sample. Where appropriate, this should be documented in the patient notes. Occasionally, further tests are requested 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.

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 laboratory may perform some additional tests that were not specifically requested, where this is essential for the interpretation of all relevant findings. Please note that HIV antibody testing will not be done without a clear request from the relevant healthcare team.

REQUESTING OF LABORATORY TESTS

Electronic Requesting (ICE requests)

Where this is available please use whenever possible as it enables more rapid receipt and processing within the laboratories.

It is important to ensure that the correct ICE (barcoded) number is attached to the correct specimen before placing inside the specimen bag. These bags are colour coded for the BRI site to facilitate efficient sorting of samples: Blue = Virology and Mycology, Green = Bacteriology.

Please ensure that you order the correct test and select the correct specimen type as failure to do this may lead to incorrect testing. The ICE requesting system will show those tests most commonly requested for Microbiology, 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 sydromic profiles (e.g. rash contact), please also check these if a test is not individually listed.

It is extremely important to include clinical details when sending specimens for microbiology 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, foreign travel, outbreaks, date of onset etc.

Request forms

If electronic requesting is not possible, the following forms are available (please note that forms for primary care and hospital patients can differ)

The following forms should be used for the following tests:

Test required	**Form**	
	BRI/Myrtle Rd	**RUH**
Routine bacterial microscopy, culture and sensitivity (MC&S)	Bacteriology/Mycology GP or Hospital request form.	Microbiology request form (blue header)
Clostridium difficile toxin		
TB		
Mycology / fungal culture		
Antibiotic/antifungal assay	Pink Antibiotic assay form	Yellow Antibiotic assay form
General Virology/Antenatal Virology and all other Serology	Virology GP or hospital request form	Virology/Serology request form (black header)
Chlamydia / Gonorrhoea NAATS	Virology GP or hospital request form	
Chlamydia Screening Programme	A5 chlamydia screening programme request form (*only use for National screening programme)*	
Sexual Health Serology Chlamydia serology Routine Syphilis Syphilis Confirmation Hepatitis B Hepatitis B post vaccine Hepatitis C	Sexual Health request form	

Referral test requests

The Bristol laboratory, Virology department receives specimens from across the southwest of England and for certain tests, the UK. Specific referral test request forms are available on request from the laboratory.

Completion of Request Forms

Poor or illegible handwriting may be misinterpreted and result in report delay or incorrect test selection. Please help to minimise this by completing all sections of the appropriate request form using a ballpoint pen. It is important to fill in the relevant request box by

placing the 'X' accurately within the box. This will facilitate the requesting process and improve speed of booking the patient onto the laboratory system.

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

Please include the following information on the request form:

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

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

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

} **One of these is essential (to match sample)**

Surname (or unique coded identifier) (please PRINT) (**Essential**)
First name(s): (**Essential**)
Gender:
First line of patient address & postcode:
Ward or location: (**Essential**)
GP code/Consultant in charge:
Bleep or contact number of the staff requesting the test:
Address for report: if different from location
Specimen type: (**Essential**)
Test(s) requested: (**Essential**)
Date and time of sampling:
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 of patient if known

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 on ICE **MUST** be labelled with the ICE generated label. Non - ICE specimens should be labelled with the following information:

NHS number or Hospital Number (if available) **or Date of birth (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.

REJECTION POLICY

Incorrectly/Unlabelled specimens

The laboratory regularly receives specimens that are unlabelled or incorrectly labelled (patient name/dob on specimen differs from that on form). We are unable to process these specimens and they will generally be rejected. Any such specimens which are difficult to repeat (CSFs, tissues etc) will be subject to discussion between one of the Duty Medical Microbiologists and the requesting Clinician. However, these specimens will only be processed in exceptional circumstances.

Incorrect sample type

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

These specimens will not normally be processed and will generally be rejected. Any such specimen that is difficult to repeat (as above) will be subject to discussion between the Duty Medical Microbiologist and the requesting Clinician. Other specimens may be rejected see section on relevant specimen types.

High risk specimens

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

Certain organisms are classified as being serious biohazards. Information can be found at www.hsc.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 following diseases without consulting the Medical Microbiologist/Virologist.

- Severe Acute Respiratory Syndrome (SARS)
- Viral Haemorrhagic Fever (VHF)
- Creutzfeldt Jakob Disease
- Rabies
- Avian Influenza

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

Samples from patients receiving radioactive isotopes

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

Medico – legal specimens

Any specimens submitted for medico – legal purposes should have documentation accompanying these specimens to provide an unbroken chain of evidence

The Bristol laboratory medico-legal procedure and Chain of Evidence form are based on recommendations from the Royal College of Pathologists and are available on the UHBRISTOL / RUHT Intranet site or 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 people

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

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

TRANSPORT ARRANGEMENTS

Please note that the Myrtle Road site is not within the grounds of the BRI. When sending specimens for virology or fungal investigations to Myrtle Road, please ensure that the destination is clear. This is especially important outside of normal hours, where delay in specimen receipt can be significant if specimens are sent to the wrong place. Virology specimens taken out of hours should be discussed with the Duty Virologist before dispatch to the laboratory. If there is a delay in transporting the specimen, it should be refrigerated but not frozen. The Myrtle Road laboratory may be unoccupied when specimens are delivered; for most specimen types it is acceptable to leave them in the specimen drop off box outside the main entrance door as long as there has been prior agreement to do so. 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.

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 during the normal working day.

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 laboratory reception.

UHBristol

Transport from within the UHBristol is provided by porters who undertake several ward and department collections throughout the day. There are also regular deliveries from all UHBristol hospital sites direct to the laboratory. The pneumatic tube system may also be used where appropriate but please note that this tube system is unavailable from or to the Myrtle Road site (virology and mycology).

Urgent specimens out of hours should not be sent before agreement with the laboratory on-call staff. Urgent specimens must be sent to the laboratory immediately and arrangements made with the portering service if the pneumatic tube is not an option (ie for transport of virology specimens).

GP Practices

Regular van collections are scheduled for all GP Practices during the working week, using either PHE vans, UHBristol or NBT hospital transport, or all three. Specimens sent by post should be sent in accordance with the relevant Post Office Regulations, a copy of which is available from the laboratory on request.

Royal United Hospital Bath NHS Trust

Internal transport of samples at the Bath site is under RUH Trust management. This consists of regular RUH portering rounds and van transport between GP practices.
Urgent transport of samples on site is undertaken by RUH portering staff.
Transport of specimens from Bath RUH pathology reception to Bristol is undertaken by the PHE van drivers and occurs 4 times a day on weekdays and once a day, via courier at weekends. Departure times from Bath are:

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

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 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 eg 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

All appropriately packed, urgent specimens for bacteriology may be sent via pneumatic tube, **except for** those also requesting investigation for Hazard group 4 viruses. Urgent samples for virology and mycology out of hours should not be sent via the tube system. Separate transport of these specimens must be arranged following discussion with the laboratory. 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 ICE 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

Computer Accessing of Results

All completed results are available on the computer system. Results should be accessible for all NHS users via VPLS and is the recommended method of accessing all patient results. All results, however requested, are available in ICE. Accessing results in this way is quicker, more secure and accurate and ultimately faster than telephoning the laboratory.

An AvonWeb Clinical Portal account is required for access and users must have a personal NHS email account (ending nhs.uk or nhs.net) to apply. Users who currently do not have electronic access to results may self-register on line to access VPLS using the following address: http://portal.avon.nhs.uk/vpls/. Guidance on registration and looking up results is given on the first page.

If the request is found but the result is not yet visible this usually implies that the testing is incomplete and final result is not yet available. However, if the result is still required urgently for clinical management of the patient then please telephone the laboratory.

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

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

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

Laboratory Fax policy

It is laboratory policy not to fax results outside of exceptional, pre-agreed arrangements.

Telephone enquiries

Please restrict these as far as possible for results that are not yet available on the hospital computer or for those requiring clinical discussion. Refer to Turnaround Time (TAT) guidelines given on page 30.

Results from Urgent Requests

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

.

Clinical Enquiries and advice

Clinical advice is available from the medical virologists and microbiologists and senior clinical scientific staff throughout normal working hours using the departmental numbers listed on page 61. Information on specimen collection and test selection can be found on the following:

- Bacteriology Pages 27 – 40
- Mycology Pages 41 – 44
- Virology Pages 45 – 49

Out of hours clinical advice may be accessed via BRI/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 and arrange this;

Bacteriology:	0117 342 2514
Mycology:	0117 342 5028
Virology:	0117 342 5033

Additional tests should be requested as soon as possible after the initial request as retention times vary depending on sample type.

REPERTOIRE OF TESTS / SERVICES

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

BACTERIOLOGY

Bristol Royal Infirmary Site

- Clinical advice / Infection Control
- Routine bacteriological examination (microscopy and culture) of the following clinical specimens:
    - Blood cultures
    - Bronchoalveolar lavage/washings
    - Cerebrospinal Fluid
    - Faeces
    - Fluids, aspirates, pus and swabs from all sites
    - Genital specimens
    - Ocular specimens
    - Sputum
    - Urine
- Routine microscopy for mycobacteria and culture of all clinical specimens except blood cultures
- Routine Aerobiology (theatre, isolator room, BMT, AHU, pharmacy) but not for commissioning Theatres
- Bioburden (SSD)
- Culture for *Helicobacter pylori*
- *Clostridium difficile* toxin
- Environmental Monitoring
- Faecal Occult Blood (UHBristol specimens only)
- MRSA Screening
- Chlamydia/GC NAATs - see Myrtle Road site for details of testing
- Susceptibility testing
- Sterility checking (Bristol Eye Bank/Pharmacy)
- Steriliser Performance and Commissioning checks (CSSD)

Royal United Hospital, Bath Site

The satellite laboratory at the RUH performs a restricted range of tests on-site. The majority of specimens are transferred to the BRI 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
  - Environmental Monitoring (Pharmacy)
  - Susceptibility testing
  - Urgent specimens (all except faeces, sputa or other Containment level 3 categorisation)

Referred Bacteriology Tests (see Appendix)

All the following routinely referred tests are undertaken by CPA accredited laboratories:

- Identification and susceptibility testing of *Mycobacterium* sp,
- Molecular detection and drug resistance of *Mycobacterium tuberculosis*
- Blood culture for *Mycobacterium sp,*
- Full Identification and typing of *Salmonella sp,* and *Shigella sp*
- Toxin testing of *E.coli O157*
- Toxin testing and phage typing of *Staphylococcus aureus*
- Typing of and PCR for *Bordetella pertussis*
- PCR for *N. meningitidis*
- PCR for *S. pneumoniae*
- Identification and/or susceptibility testing of unusual or difficult organisms
- Serology (see under Virology)
- Typing of organisms for epidemiology and surveillance purposes

MYCOLOGY

- Clinical advice

- Routine mycological examination (microscopy and culture) of the following clinical specimens:
    - Skin
    - Hair
    - Nails
    - Bronchoalveolar lavage
    - Sputum
    - CSF
    - Tissue and biopsies
    - Aspirates/pus

- **Antifungal drug assays:**
    - Amphotericin
    - Fluconazole
    - Flucytosine
    - Itraconazole
    - Voriconazole
    - Posaconazole

- **Serological Tests**

Antibody Tests for:	**Antigen Tests for:**
A*spergillus*	A*spergillus*
Candida	*Candida*
Farmer's lung	*Cryptococcus*
Avian Precipitins	*Beta 1-3 Glucan*

Serology of non-indigenous mycoses: Coccidioides, Histoplasma, Blastomyces, Paracoccidioides.

PCR tests for *Aspergillus, Candida* and pan-fungal on blood, sterile body fluids and tissues

VIROLOGY

- Clinical advice / Infection Control
- Bronchoalveolar lavage/washings and sputum for Direct Immunofluorescence (IF) for Pneumocystis jiroveci
- Legionella pneumophila: urinary antigen
- Streptococcus pneumoniae: urinary antigen
- Helicobacter pylori faecal antigen
- Nucleic acid amplification tests (NAAT)for the following (LTT 2-5 days dependent on target):
    - Respiratory viruses (Influenza A and B, RSV, human metapneumovirus, adenovirus, parainfluenza viruses 1,2,3, Rhinovirus)- Nose and throat swabs, throat gargles, nasopharyngeal aspirates, sputum, bronchoalveolar lavage
    - Chlamydia trachomatis
    - Neisseria gonorrhoeae
    - CMV (quantitative) - Blood, amniotic fluid, CSF, urine, bronchoalveolar lavage, sputum (qualitative result only)
    - HSV 1 and 2 – CSF, blood, vesicle fluid, bronchoalveolar lavage, sputum, eye swabs and genital swabs
    - Hepatitis C (qualitative and quantitative, optional genotyping) – blood
    - Hepatitis B (quantitative)- blood
    - Parvovirus – blood, amniotic fluid
    - HIV quantitative (viral load) blood
    - Adenovirus – quantitative test = blood (immunocompromised patients), - qualitative test = respiratory secretions, eye swabs
    - BK virus (quantitative) – blood, urine (immunocompromised)
    - Enterovirus – CSF, blood, throat swab, faeces
    - VZV – CSF, blood, lesion/vesicle fluid or swab
    - EBV (quantitative)- CSF, blood
    - Gastroenteritis viruses- norovirus, adenovirus, rotavirus, astrovirus and sapovirus – faeces, vomit
    - HHV6 – CSF, blood
- Susceptibility/resistance testing to oseltamivir (Pandemic vH1N1 2009 influenza only)
- Serological tests for the following:
    - Adenovirus
    - Anti-DNAse B, Antistreptolysin (ASO)
    - Bartonella
    - Borrelia burgdorferi (Lyme)

- Brucella
- Chlamydia trachomatis,
- Chlamydia psittaci,
- Chlamydia pneumoniae
- Coxiella burneti (Q Fever)
- Cytomegalovirus
- Epstein Barr Virus (EBV)
- Hepatitis A, B, C, and E
- Herpes simplex virus
- HIV 1 and 2 antigen/antibody and antibody only
- HTLV antibody assay
- Influenza A and B
- Measles virus
- Mumps
- Mycoplasma pneumoniae
- Parvovirus
- RSV
- Rubella
- Syphilis
- Toxoplasma
- Varicella zoster

(LTT range-2-5 days dependent on test)

Referred Virology and Microbial Serology Tests (see Appendix 2)

The following tests may be referred to other CPA accredited laboratories (list not exhaustive)

Amoebic serology for invasive disease
Antiviral assays (acyclovir, ganiclovir)
Antistaphylococcal antibodies
Arboviruses (alphaviruses and flaviviruses, including Dengue and West Nile)
Bordetella pertussis
Borrelia burgdorferi (Lyme) (for confirmation of screen positive specimens)
Diphtheria (immunisation response)
Echinococcus (Hydatid disease)
Enterovirus IgM
Hantaan
Hepatitis D
Leptospirosis
Meningococcus (immunisation response)
Pneumococcus
Pseudomonas
Rabies (immunisation response)
Rickettsia
Schistosomiasis (Bilharzia)
Tetanus (immunisation response)
Toxocariasis
Toxoplasmosis (confirmation/PCR)
Viral Haemorrhagic Fevers (e.g. Lassa, Ebola

COLLECTION OF SPECIMENS AND INTERPRETATION OF RESULTS

(Refer also to table on page 52)

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

BACTERIOLOGY

Laboratory Turn Around Times (LTT)

Laboratory Turnaround Time is the time from receipt of the specimen into the laboratory to 90% of the reports being issued

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

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.

Antibiotic Assay

Gentamicin, tobramicin and vancomycin assays are now undertaken by Chemical Pathology. Clinical advice on appropriate dosage and out of range assays is still available from microbiology.

Please refer to relevant Trust Antibiotic Guidelines on the intranet site for Gentamicin and Vancomycin

All other assays must be discussed with a Medical Microbiologist or virologist before being requested as they are sent to a reference laboratory for processing. These may include amikacin, teicoplanin, acyclovir and ganciclovir assays which must be received into the PHE laboratory by 1200h to ensure same day processing. Assays arriving after this time will be processed the following day

(LTT – 0.5 days)

(See Mycology section for antifungal assays)

Blood Cultures

Blood culture sets may be ordered from the laboratory. Blood culture is not generally advisable in General Practice as patients who require blood cultures generally require hospital care and delay

in incubation of bottles may compromise results. The standard blood culture set consists of two bottles (one purple, one blue cap). A single paediatric bottle (yellow cap) is available for neonates and infants.

Special blood culture collection sets are available to facilitate the safe taking of blood cultures using a butterfly collection set (see bottle set insert for details)

Volume of blood per bottle

Blood cultures are used to detect bacteraemia. Their sensitivity increases with the volume of blood submitted, so a blood culture set containing only 10mls blood (5 mls in each bottle) will miss approx ¼ of the bacteraemias that would be detected by a properly filled set (10 mls in each bottle). In adults inoculate 10mls blood into each culture bottle sent.

Number of blood culture sets per septic presentation

Data shows that the percentage of diagnosed bacteraemia increases where more than one set of blood culture bottles are submitted.

If sepsis persists for > 48 hrs without a diagnosis discussion with a medical microbiologist and further blood cultures may be indicated.

Timing and site of blood cultures

Submitting blood cultures taken from separate sites helps with interpretation of the significance of positive cultures. Blood culture sets should be taken before starting antibiotics. Blood cultures should be collected peripherally unless line-associated infection is suspected, in which case blood cultures from both peripheral and line should be collected. The blood culture sets do not have to be taken at different times.

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. If you are unsure of the correct technique please contact Clinical Skills Training on Extn 20338 (UHB Trust)

a. Disinfect the skin carefully at the venepuncture site using a chlorhexidine/alcohol wipe and allow to dry before piercing the skin
b. **If blood for other tests such as blood gases, or ESR is to be taken at the same venepuncture the blood culture bottles MUST be inoculated first to avoid contamination of the cultures**

c. When using the two bottle set and the butterfly and adapter cap system the aerobic bottle should be filled first to avoid the air in the butterfly tubing entering the anaerobic bottle.
d. Remove the plastic caps from the culture bottles, wipe the rubber diaphragms with the chlorhexidine/alcohol wipe provided, allow to dry and inoculate 10ml into each bottle
e. For paediatric bottles, add as much blood as possible up to a maximum of 4ml
f. Put the bottles in the plastic specimen bag and complete the request form or ICE request giving relevant clinical details. This **must** include details of foreign travel, suspected enteric fever, brucellosis etc to ensure laboratory staff safety and correct handling. Ideally the laboratory should be notified in advance of any high risk blood culture being sent. In addition to the safety details please give details of other clinical symptoms or underlying disease and treatment given or anticipated.
g. Label each bottle with patient addressograph or ICE generated label PLUS add the actual date and time of collection and indicate if taken from a line (be specific about which line)
h. Blood cultures must be sent to the laboratory as soon as possible for incubation. They should NEVER be refrigerated

Blood culture status is continually monitored automatically. All blood cultures are treated as urgent specimens so the laboratory does not need advance notification of them being taken.
Results of all significant positive blood cultures are telephoned to a clinician as soon as they become positive. As the isolation time depends upon the organism and the inoculum, this may vary from a few hours and up to five days after receipt. (LTT 1 – 6 days)

Bronchoalveolar Lavage and Associated Specimens

These are the specimens of choice for the diagnosis of lower respiratory tract infection as they are less likely to be contaminated with normal upper respiratory tract flora.
(LTT 2-5 days)

CSF

It is essential that sufficient specimen is sent for all the tests required. This is particularly important if tuberculous infection is suspected where small numbers of organisms may be present. If sub-arachnoid haemorrhage is suspected, send three sequentially labelled specimens (clearly labelled 1, 2 and 3) so that differential red cell counts may be performed. The presence of xanthochromia cannot be determined reliably by macroscopic appearance so is not reported in microbiology. Spectrophotometric analysis for xanthochromia is available from Chemical Pathology.

The results of positive microscopy and/or cultures should be discussed with the medical microbiologist. All microscopy results are available on the computer as soon as available.

(Microscopy LTT 1-2hrs)

(Bacterial culture LTT 2 days)

(Viral PCR for standard test set of HSV, VZV, Enterovirus three times weekly)

Eye Specimens

Swabs

Conjunctival swabs should be sent for the diagnosis of superficial infections. Charcoal transwabs should be used for bacterial culture and plain swabs in special transport medium for chlamydia. A special chlamydia slide may also be sent for immunofluorescence.

Corneal Scrapes

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.

The ulcer should be scraped using a sterile scalpel blade and the blade dropped into the bijou of broth. A second scrape should be used to inoculate both of the glass slides within the marked area for virology (immunofluorescence) and bacteriology (microscopy). **Ensure that the slides are labelled in pencil with the patient name on the same side as the smear.**

The laboratory should be notified by phone in advance of all scrapes taken.

(LTT: Microscopy: Same day Culture: 2 –3 days)

Culture for acanthamoeba

If culture for acanthamoeba is required this must be indicated specifically on the request as specialist media has to be freshly prepared. (LTT up to 5 days)

Deep or operative eye specimens should be sent directly to the laboratory for urgent processing. Delays can compromise results.

(LTT up to 5 days)

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]

Faeces (see also p47 virology section)

Enteric pathogens

All diagnostic specimens are cultured routinely for the following: *Salmonella sp, Shigella sp,* campylobacter and *E.coli 0157.* In addition, children under 10yrs old with diarrhoea will have culture for *Yersinia enterocolitica* performed. (LTT 2 – 4 days)

Faeces will only be cultured for *Vibrio cholerae* in patients where there is a relevant travel history. (LTT 2 – 4 days)

Send a "grape-sized portion" (5 to 10 ml if liquid), of faeces in a sterile container. Other specimens are of little value for the isolation of faecal pathogens. Do not send more than one specimen from the same patient on the same day.

Clearance specimens from patients previously positive with non-typhoidal salmonella, *S. sonnei* and campylobacter are not required unless there is a recurrence of new symptoms. The CCDC will advise where clearance specimens are indicated (eg *S,typhi, S. paratyphi, S. dysenteriae, S. flexneri, S. boydii, V. cholerae* and *E.coli 0157)*

Clostridium difficile

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

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

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

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

These details **must** be clearly stated on the request or testing or *C. difficile* may not be performed (LTT up to 1 day)

Ova cysts and parasites

Routine screening for *Cryptosporidium sp i*s undertaken on all specimens from suspected outbreaks and on diagnostic specimens from immunocompromised patients and those aged <45 years. There is no need to request this as a separate OC&P investigation.

For patients with relevant travel or clinical history at least 3 specimens of faeces, passed at different times, should be sent for parasitology giving relevant clinical details.
(LTT 2 days)

For the investigation of threadworms, an early morning sellotape slide should be sent. These are available from the laboratory supplies departments.
(LTT 1 day)

Fluids and Aspirates

Should be sent in a plain, leak-proof, screw-capped container. Some fluids such as ascitic and peritoneal dialysis fluid benefit by inoculation directly into blood culture bottles. 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 will only be undertaken on ascitic fluid if clinical details suggest Spontaneous Bacterial Peritonitis (SBP) and will also be routinely performed on the first peritoneal dialysis fluid sent.
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.
(LTT Microscopy: Same day Culture: 2 - 3days)

Genital Tract Specimens

For the diagnosis of genital *Chlamydia trachomatis* infection see page 34

Specimen/clinical diagnosis	Swab /Transport medium	For the detection of:
Vulval	Charcoal transwab	*Candida* sp.
		S. aureus
		beta-haemolytic streptococci
HVS	Charcoal transwab	*Candida* sp.
		Trichomonas vaginalis (TV)
		beta-haemolytic streptococci
Air-dried smear of vaginal discharge	Send on labelled glass slide in slide carrier	Bacterial Vaginosis (BV)
Cervical/endocervical (CX) or combined HVS/CX swab	Charcoal transwab	*Neisseria gonorrhoeae#*
		Candida sp.
		beta-haemolytic streptococci
Urethral (URE) - Female	Charcoal transwab	*Neisseria gonorrhoeae*
Urethral (URE) - Male	Small headed swab (ENT swabs may be used) in charcoal transwab	*Neisseria gonorrhoeae*[#]
STI - Female	Cervical/endocervical (CX) or combined HVS/CX swab	*Candida* sp., *N. gonorrhoeae*[#] *TV*
STI - Male	Urethral in charcoal transwab	*Candida* sp., *N. gonorrhoeae*[#]
PID	Triple swabs (HVS, CX, URE) + 2nd CX	*Candida* sp., *N. gonorrhoeae*,#other organisms
?Herpes simplex lesion	Plain swab of lesion in viral transport medium (VTM)	*Herpes simplex*
Chlamydia / *N.* gonorrhoeae NAATS	Endocervical swab Urethral swab First void urine	Special collection kits required *– see below*

swab for culture recommended to allow for susceptibility testing if isolated.

Genital *Chlamydia trachomatis* diagnosis

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

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*. A swab for GC culture is also recommended to allow for susceptibility testing if isolated.
(LTT: 4 -5 days)

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 – Charcoal transport medium is essential if gonorrhoea is suspected.

An HVS alone is unsuitable for the diagnosis of gonorrhoea and investigation of Pelvic Inflammatory Disease.

If Bacterial Vaginosis (BV) is suspected send an air - dried smear of the vaginal discharge for microscopy.
(LTT 2 - 3 days)

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 charcoal transport medium for bacterial culture or specific swabs for chlamydia (LTT 2 – 3 days)

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

MRSA Screening

Transwabs taken from the nose, groin/perineum, wounds or skin lesions and catheter urines are suitable for screening for MRSA.. If normal request forms are used, please state 'MRSA SCREEN' **NOT** 'MCS as the investigation required. If ICE request please use one ICE request per sample. Place all specimens from one patient in a single bag with one screening form. If the patient has had MRSA previously please state in the clinical details.
These swabs may also be used by the laboratory for screening for methicillin susceptible *S. aureus* (MSSA) in pre-operative **cardiac** patients so please state this on the form to ensure correct processing.
Refer to the Trust Infection Control Policy. (LTT Negative results 1-2 days, Positive results 3-4 days)

Nasal Swabs

Nasal swabs are usually performed to detect staphylococcal carriage. (LTT 1-3 days). If samples require screening for both MRSA and MSSA please send separate samples for both to facilitate processing. If only a single swab is taken please state that screening for MSSA is required as well as screening for MRSA

Non-MRSA screening swabs

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

Pernasal Swabs for *Bordetella pertussis*

Pernasal swabs are the most reliable way of making the diagnosis of whooping cough. Special pernasal transwabs consisting of a thin flexible wire swab and charcoal transport medium are available from the laboratory. (LTT 7-10 days)

Pertussis serology is usually more useful in adults presenting with a prolonged cough or in children where the cough has persisted for > 2 weeks..

PCR on pernasal swabs or nasopharyngeal aspirates is now also available (as a referred test) for the diagnosis of *B. pertussis* infection in acutely ill children of < 12 months. (LTT 2 days)

Sputum

Sputum is of little value in the diagnosis of lower respiratory tract infection (with the exception of TB) - see bronchoalveolar lavage. If sent, purulent sputum, not saliva, is required (saliva will be discarded by the laboratory). 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 (LTT 2 – 3 days)

If tuberculosis is suspected, send three specimens of early morning sputum taken on consecutive days.
Urgent microscopy for AAFB (LTT 2-3hours); Microscopy for AAFB (LTT 1-2 days)
Culture for AAFB (LTT up to 12 weeks)

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 (LTT 2 days)

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 (LTT up to 5 days)

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.
(LTT 2 days)

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* should be placed in **the lid** of a sterile container to which a very small volume of sterile saline has been added to prevent desiccation. They should be transported **immediately** after **first** informing the laboratory.

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. (LTT 2 – 7 days)

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. To access the algorithm from within UHBristol please follow the link below:

http://connect/Divisions/DiagnosticAndTherapy/LaboratoryMedicine/PublicHealthEngland/Urinalysis%20Algorithm/BGSOP%20BG26%20Urinalysis%20algorithm%20v3.0%20May%202011.pdf

To access the RUH pathology handbook please follow the link below:
http://www.ruh.nhs.uk/gps/pathology/handbook/index.asp

Clean-voided midstream urine is preferred for bacterial, and fungal cultures. Transport 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 heavily 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. (LTT 2 - 3 days)

NB. Boric acid containers are unsuitable for use with the laboratory analyser currently in use

Catheter specimens of urine 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. Patients with long-term catheters are invariably colonised with one or more microorganisms.

Diagnosis of mycobacterial infection

Urine specimens will be cultured for mycobacteria only if:

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

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

Send 3 **entire** early morning urine (EMU) (when urine is most concentrated) taken on 3 consecutive days. Large volume EMU containers are available on request from the laboratory. (LTT up to 12 weeks)

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. (LTT 1 day).

Detection of urinary legionella antigen or pneumococcal urinary antigen

Send plain urine specimen to Myrtle Road site for testing

Wound and Pus Swabs

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

Pus, if present, is the specimen of choice and should always be sent if available in preference to a swab. Aspirate any material with a sterile needle and syringe and transfer to a clean, leakproof, screw capped universal container. Do not send to the laboratory in the syringe and needle as this is hazardous to staff handling the specimen. If it is necessary to send the syringe then carefully remove the needle and cap the syringe. It is unnecessary to send routine specimens from the same site on consecutive days unless there is clinical deterioration (LTT 2 – 5 days).

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.

MYCOLOGY

The Mycology Reference Laboratory (MRL) is part of the Microbiology Services Division dealing with Specialist and Reference services. It 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.

The MRL also houses the National Collection of Pathogenic Fungi (NCPF), which is the only culture collection in the UK specialising in fungi pathogenic to humans and animals.

Clinical Services

Advice by telephone to ensure selection of the most appropriate test or specimen types for particular patients and assistance with the interpretation of results
Guidance on the clinical management of individual cases

Antibody Tests

For A*spergillus, Candida,* farmer's lung and avian allergens we require blood in a plain vacutainer. (Tests for additional fungal pathogens may be available following discussion with the laboratory).
(LTT 2 - 6days for *Aspergillus* and *Candida*); (LTT 4 -11days for avian and farmer's lung)

Antigen Tests

For A*spergillus , Candida* antigen and Beta 1-3 Glucan tests we require blood in a plain vacutainer. Beta-1-3-Glucan tests can also be conducted on other sterile body fluids and the *Aspergillus* galactomannan test can be conducted on BAL samples.
For the *Cryptococcus* antigen test blood or CSF can be tested (minimum volume 300ul).
(LTT on day of receipt for cryptococcal antigen; 2 - 4 days for other antigen tests).

Antifungal drug assays

The following assays are routinely performed:
flucytosine, itraconazole, voriconazole, posaconazole and amphotericin B and fluconazole by arrangement

A clotted blood specimen is required, minimum volume 2ml
Please contact the laboratory before submitting specimens for amphotericin B or fluconazole assays, as their measurement is not often indicated**.**

Antifungal Assays	
5-FLUOROCYTOSINE (FLUCYTOSINE) Reference Range: Trough 20-40mg/L Peak 70-90mg/L	Assay is necessary to ensure adequate therapeutic concentrations and avoid toxicity associated with excessive concentrations. After 2-3 days of therapy take a pre-dose and a post dose specimen (30 min after an IV dose or 2hr after an oral dose). Provided the result is satisfactory the test should be repeated twice weekly.
ITRACONAZOLE The trough level should be maintained above 0.5mg/L There may be toxicity issues at higher concentrations >4 mg/L	After 7-14 days a trough level should be taken (10mL clotted blood). If the level is satisfactory further assay is only indicated if poor compliance is suspected or other medications likely to influence levels are changed. Liver function tests should be monitored during prolonged courses.
VORICONAZOLE The absorption and metabolism of voriconazole will vary from patient to patient and although there are no established recommendations, a level of < 1.0 mg/L is low and should be considered sub-therapeutic. Levels are often in the range of 1.0 – 6.0 mg/L. Limited published data suggest that clinical outcomes are improved with levels above 2.0 mg/L Levels above 6.0 mg/L are more likely to lead to liver toxicity and levels above 10.0 mg/L should be avoided.	After 4 days therapy a pre dose specimen should be taken: Post dose samples are harder to interpret but would be taken: 2 hours post ORAL dose 1 hour post IV dose

POSACONAZOLE **Posaconazole is only currently available as an oral preparation** The absorption and metabolism of posaconazole will vary from patient to patient and although there are no established recommendations, a level of >0.7 mg/L is generally considered satisfactory for prophylaxis and > 1.0 mg/L for treatment of active infection,	After 4 days therapy a pre dose sample should be taken: Post dose samples are harder to interpret but would be taken: 2 hours post ORAL dose
AMPHOTERICIN B **Monitoring of blood concentrations of amphotericin B during treatment is seldom indicated.** **The optimum serum concentrations of the drug for particular fungal infections have not been determined. Toxicity is assessed by monitoring renal function.** Although amphotericin B is nephrotoxic, high blood concentrations do not lead to greater impairment of renal function, nor does renal failure result in higher blood concentrations.	

All specimens submitted for antifungal assay must have the following information:

- The dose and frequency of the drug
- The date and time that the drug was administered
- The date and time that the level was taken
- The indication (reason) for the antifungal drug
- Failure to provide this information will make it impossible for the laboratory to interpret the result.

Flucytosine assay – LTT: telephone results are given on the day of receipt provided the specimen is received before noon, otherwise results are available the following day.

Itraconazole assay - LTT 2 - 4 days.

Voriconazole assay – LTT 2 –3 days

Posaconazole assay – LTT 2-3 days

Serological tests

Tests for antibodies to *Aspergillus*, *Candida*, farmer's lung and avian allergens.

Serology of non-indigenous mycoses

Tests for *Aspergillus*, *Candida* and *Cryptococcus* antigens, and beta 1-3 Glucan.

PCR: *Aspergillus*-specific, *Candida*-specific and pan-fungal

Fungal Microscopy and culture of clinical specimens.

COLLECTION OF SPECIMENS FOR MYCOLOGY

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 and Hair

Clippings should include the full thickness of the nail and extend as far back from the edge as possible. Hair should be plucked from affected areas together with skin scrapings from associated scalp lesions. As with skin these should be sent in a Mycology transport pack.
(Microscopy LTT 3 days) (Culture LTT normally 7 - 14days)

Other Clinical Specimens

eg: sputum, bronchial washings, CSF, biopsies, aspirates

Details are the same as for bacteriology.
(Microscopy LTT 1-2 days) (culture LTT 2-14 days)

VIROLOGY

INTRODUCTION

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

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

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

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

MICROBIAL SEROLOGY - General guidance

A list of serology tests performed in the laboratory can be found on page 26.

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 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.

Salivary antibody testing for measles, mumps, or rubella antibody may be appropriate where it is difficult to get blood. The collection kits are supplied by the local Health Protection Team (08455048668).

(LTT range-2-5 days dependent on test)

1. PCP DIRECT IMMUNOFLUORESCENCE

Sputum and bronchoalveolar lavage fluid

BAL samples are processed by IF for *Pneumocystis jirovecii,*. PCR testing is preferred for respiratory viruses.

2 CHLAMYDIA/GONORRHOEA MOLECULAR DETECTION

See page 53

3 MOLECULAR DIAGNOSTICS

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

When requesting PCR 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 contemporary EDTA blood for the relevant PCR; please contact the laboratory if there is any doubt over which specimen types to send.

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

- NAAT tests are available for the following:
    - Respiratory viruses (Influenza A and B, respiratory syncytial virus, human metapneumovirus, adenovirus, parainfluenza 1,2,3, Rhinovirus)
        - Respiratory samples including nose and throat swabs, throat gargles, nasopharyngeal aspirates, sputum, bronchoalveolar lavage, ET secretions
    - Adenovirus
        - Blood (quantitative PCR, immunocompromised patients), Respiratory secretions, eye swabs, CSF (qualitative PCR)
    - BK virus (quantitiative PCR)
        - Blood, urine (immunocompromised)
    - CMV
        - Blood, amniotic fluid, CSF, urine, eye fluid (quantitative) Bronchoalveolar lavage, sputum (qualitative),
    - Enterovirus (qualitative)
        - CSF, blood, faeces, eye swab, throat swab
    - EBV (quantitative)
        - CSF, blood, eye fluid
    - Gastroenteritis viruses- Norovirus, adenovirus, rotavirus, astrovirus and sapovirus
        - Faeces, vomit
    - Hepatitis B (quantitative)- blood
    - Hepatitis C (qualitative and quantitative, optional genotyping)
        - Blood
    - HSV 1 and 2 (qualitative)
        - Lesion swabs, CSF, blood, vesicle fluid, bronchoalveolar lavage, sputum, eye swabs, eye fluid
    - HHV6 (quantitative)
        - CSF, blood
    - HIV quantitative (viral load)
        - Blood, CSF (rarely)
    - Parvovirus (quantitative)
        - Blood, amniotic fluid
    - VZV (qualitative)
        - Lesion swab, vesicle fluid, CSF, blood, eye fluid

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

(LTT – 2-7 days dependent on assay)

4 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)

(LTT range-2-5 days dependent on test)

Antenatal screening

- Hepatitis B, Rubella Immunity, HIV and Syphilis serology.

(LTT range-2-5 days dependent on test)

NOTIFICATION OF INFECTIOUS DISEASES

It is the statutory duty of the attending Registered Medical Practitioner to notify the proper officer on diagnosis of a suspected notifiable disease (list below). Forms for the Notification of Infectious Diseases are available online at:

http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/NotificationsOfInfectiousDiseases/

Completed forms should be sent to:

Avon, Gloucestershire and Wiltshire PHE Centre
2 Rivergate
Temple Quay
Bristol
BS1 6EH

Any urgent notification should be communicated by telephone to Avon, Gloucestershire and Wiltshire PHE Centre on 0845 504 8668 (option 1) or, if out-of-hours, to the on call service accessible via 0844 257 8195. Telephone contact should be followed by written notification.

Additonally, specific forms are available from the TB team for written notification of cases of tuberculosis. Completed forms should be sent to:

TB Nurses
Lawrence Hill Health Centre
Hassell Drive
Bristol
BS2 0AN

Notifiable Diseases

- Acute encephalitis
- Acute infectious hepatitis
- Acute meningitis
- Acute poliomyelitis
- Anthrax
- Botulism
- Brucellosis
- Cholera
- Diphtheria
- Enteric fever (typhoid or paratyphoid fever)
- Food poisoning
- Haemolytic uraemic syndrome (HUS)
- Infectious bloody diarrhoea
- Invasive group A streptococcal disease
- Legionnaires' Disease
- Leprosy
- Malaria
- Measles
- Meningococcal septicaemia
- Mumps
- Plague
- Rabies
- Rubella
- SARS
- Scarlet fever
- Smallpox
- Tetanus
- Tuberculosis
- Typhus
- Viral haemorrhagic fever (VHF)
- Whooping cough
- Yellow fever

SPECIMENS REQUIRED FOR THE INVESTIGATION OF MICROBIAL DISEASES

(VTM= Virus Transport Medium)
(BTM = Bacterial Transport Medium – transwab in charcoal transport medium)
(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	Send pus in a clean leakproof screw capped universal container or if material is limited, a swab in BTM. Always send pus if possible.	Theatre specimens taken outside of normal laboratory hours may need to be examined promptly – contact the BMS on-call via switchboard
Actinomycosis	Pus or material from dacrocystitis in a clean leakproof screw capped universal container is preferable to a swab	
AIDS (Acquired Immune-Deficiency Syndrome)	Blood (PCB) for HIV antibody test	HIV testing will not be performed without written request
Amoebiasis	Three specimens of faeces taken on separate days for cyst examination. 5 -10 ml of blood (PCB) for serology.	
Bacteraemia	Blood culture.	See blood culture procedures above.
Bacterial Vaginosis	Air dried smear of vaginal discharge	Send on labelled glass slide in approved slide holder
Bartonella	PCB for serology	
Botulism (Food poisoning)	Blood (PCB) for toxin testing. Faeces and suspect food (if possible) for culture and toxin testing.	Consult a medical microbiologist.
Neonatal botulism	Blood (PCB) for toxin testing	
Wound botulism infection	Pus/tissue specimens for culture and blood (PCB) for toxin testing	
Bronchiolitis	Nasopharyngeal aspirate (or BAL) for Polymerase chain reaction (PCR) for RSV, influenza A and B parainfluenza viruses, adenovirus and Rhinovirus.	
Brucellosis	3 sets of blood culture bottles. Blood (PCB) for serology.	See blood culture procedures above. **PLEASE ENSURE SPECIMEN IS LABELLED AS 'DANGER OF INFECTION'** Consult a medical Microbiologist

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

Coxsackie virus infection	Faeces for enterovirus PCR Throat swab in VTM for enterovirus PCR CSF from patients with meningitis	Consult a medical virologist if infection suspected in SCBU.
Cryptococcosis	Biopsy CSF Blood (PCB) specimen for antigen detection	Consult a medical microbiologist
Cytomegalovirus	Clotted blood for CMV IgM/ IgG (PCB) EDTA blood is required for CMV DNA detection Plain urine in a 30 ml sterile container. CSF, BAL, sputum may also be processed	Discuss with a virologist if systemic infection is suspected Three urines taken in the first three weeks of life should be taken to investigate congenital infection, as well as blood for IgM. Discuss with a virologist if considering antiviral therapy
Cytomegalovirus (cont)		Obtain current blood sample from the mother if congenital infection is suspected.
Diarrhoea	Faeces - 3 specimens – do not send more than one specimen a day (Faecal specimens need to be obtained as soon as possible after the onset of symptoms especially if viral diarrhoea is suspected) If patient has been in hospital for > 3 days only send a sample for *C. difficile*	If an outbreak is suspected, contact medical Microbiologist /Virologist Indicate any suspect food , travel abroad etc. on the request form and the occupation if relevant e.g. food handler, farmer etc Refer to 'food poisoning' section if relevant
Diphtheria	Nose and throat swabs Swab of tropical ulcer or skin lesion	Inform a medical microbiologist and the CCDC immediately. Details of immunisation history and foreign travel essential
Echovirus infection	Faeces for enterovirus PCR Throat swab in VTM for entervirus PCR CSF from patients with meningitis	Consult a medical virologist if infection suspected in SCBU
Eczema	Swab of skin lesion Swab in VTM for HSV and VZV PCR if eczema herpeticum is suspected	

Encephalitis	CSF Faeces for enterovirus PCR Throat swab in VTM	Discuss with a medical virologist Blood for serology (PCB) may be valuable in some cases.
Endocarditis	3 sets of blood cultures taken at least an hour apart over a period of 24 hours. If patient very unwell 3 specimens taken separately over 1 hour are acceptable Blood (PCB) for Q Fever, Bartonella, chlamydia and fungal serology if indicated Serial C – Reactive Protein (CRP) measurements	See blood culture procedures above Send to Virology Send to Biochemistry
Enteric fever (Typhoid and paratyphoid)	Blood cultures Urine for typhoid culture Faeces (generally positive later in illness). Occasionally bone marrow for culture.	Consult a medical microbiologist immediately Give details of foreign travel, contacts etc. Clearance specimens are required (see page 37) Notify to the CCDC.
Food poisoning	Faeces Suspected food Vomit may be processed for Norovirus	Consult medical Microbiologist/ Virologist and notify CCDC. Faecal specimens should be obtained as soon as possible after the onset of symptoms especially if viral diarrhea Clearance specimens not normally required (see page 32)
Fungal infection of skin, hair and nails	Hair stumps Skin scrapings Nail parings	Mycology Transport packs are available from the laboratory or from the stores in Bath for transport of these specimens
Giardiasis	3 specimens of faeces taken on consecutive days for cyst examination	
Glandular fever (Epstein Barr Virus)	Blood (PCB) for serology Monospot (Haematology)	Send to Virology

Gonorrhoea	Swabs or urine for NAAT Charcoal transwab of urethra, endocervix, rectum, conjunctiva and throat as indicated	HVS are unsuitable for gonorrhoea culture (though suitable for NAAT)
Hand foot and mouth disease	Faeces , vesicle fluid or Throat swab in VTM for enterovirus PCR	Consult a medical Virologist
Hepatitis (undiagnosed)	Blood (PCB) for antibody and antigen tests	
Hepatitis A, B, C, E	Blood (PCB) EDTA blood is required for HBV and HCV viral load testing	Hepatitis C antibodies may not be detectable for up to 3 months after the date of onset Hepatitis C Qualitative PCR requires 1.5ml serum Hepatitis A IgM may not be detectable in the first week of the illness
Herpes simplex	Swab from the base of a lesion in VTM.	Serology is rarely of value except in primary infections and some settings in pregnancy.
HIV	Blood (PCB) for HIV antibody test EDTA blood if HIV viral load required	Consent must be obtained prior to testing.
Hydatid disease	Blood (PCB) for antibody test	
Influenza	Throat swab in VTM or throat washings for PCR Nasopharyngeal aspirate Nose swab, sputum, BAL also processed Paired (PCB)	The current PCR test detects influenza A (seasonal H3N2, H1N1, pandemic 2009 vH1N1, Avian H5N1) and influenza B
Legionnaires disease	Sputum, lung biopsy, bronchial washings, pleural fluid for culture Urine for antigen detection	
Leishmaniasis		**DISCUSS WITH A MICROBIOLOGIST AND DERMATOLOGIST BEFORE SENDING SPECIMENS**
Leptospirosis	Paired (PCB) for antibody test	Consult a Microbiologist
Listeriosis	Blood cultures CSF if clinically indicated Food if implicated	Consult a Microbiologist. Serology is of no diagnostic value

Lyme disease	Blood (PCB) for antibody test CSF as appropriate	IgG antibodies to *Borrelia burgdorferi* are detectable in the majority of patients from 6 weeks after the onset of symptoms. A proportion of patients may produce detectable levels of antibody earlier. Date of onset plus clinical details supporting a diagnosis of infection must be supplied or specimens will not be tested
Lymphogranuloma venereum	Blood (PCB)	Swabs for PCR are appropriate where there is an ulcer or proctitis.
Malaria	2.5ml blood in **EDTA** –for thick and thin blood films (undertaken in Haematology) NB. Consider the possibility of Viral Haemorrhagic Fever	Send specimens to Haematologist urgently. Consult Microbiologist or Infectious Diseases physician for clinical advice If small numbers of parasites are present repeat specimens may be required to make a diagnosis A minimum of 3 specimens is required to exclude malaria.
Measles	Throat swab in VTM PCB for serology	Contact public health to obtain salivary testing kit
Meningitis	CSF Blood culture Throat swab for bacterial culture from the patient Blood (PCB) or EDTA container for PCR	Discuss all suspect cases of meningitis with a medical microbiologist Notify to the CCDC
Molluscum contagiosum		Discuss with virologist
Mumps	Throat swab in VTM. Saliva is acceptable Paired (PCB) for serology	Saliva collection kits are available from the Health protection units (08455048668) and are sent direct to Colindale for testing.
Myocarditis Myositis	Throat swab in VTM. Faeces for enterovirus PCR Paired (PCB) for serology	
Nocardiosis	Pus, tissue, for culture	

Non-indigenous mycoses: - Coccidioides - Histoplasmosis - Paracoccidioides - Blastomyces	Blood (PCB) Other specimens may be indicated	**Please discuss with Mycologist before sending specimens**
Orf		Discuss with virologist
Osteomyelitis	Blood cultures Deep operative specimens for culture (see page 38) Blood (PCB) for ASO and Anti-staphylolysin tests is sometimes helpful Consider serial CRP measurements	
Otitis Media	Ear swab in BTM	
Parvovirus (Erythrovirus)	Blood (PCB) for antibody test (and PCR if immunocompromised).	Must give date of onset and clinical details supporting diagnosis e.g. rash, arthritis, hydrops foetalis
Pelvic inflammatory disease	Combined HVS/Endocervical swab in charcoal transport medium for gonococcal or other bacterial infection. Triple swabs (HVS, CX, URE) also acceptable Endocervical and/ or vulvo-vaginal swab for Chlamydia/gonorrhoea NAAT Blood (PCB) for chlamydia antibody tests may be helpful in some cases	HVS are unsuitable for the diagnosis of gonorrhea culture but useful for NAATs
Pneumonia	Blood cultures Purulent sputum for culture Paired (PCB) for serology for atypical pneumonia screen Urine for legionella antigen detection BAL may be indicated but is essential if aspergillosis is suspected	Please give date of onset Consider viral aetiology (send respiratory tract samples for PCR)
Poliomyelitis	Faeces Throat swab in VTM	Consult a Virologist and inform the CCDC Please note that currently used polio vaccines do not contain live virus

Pseudomembranous colitis	Faeces for *Clostridium difficile* toxin. Specimen should be liquid or take shape of the collecting container	Clearance specimens are not required
Psittacosis	Paired (PCB)	
Puerperal Fever	Blood cultures. High vaginal swabs Urine	
Pyrexia of unknown origin	Blood cultures Throat swabs Urine Faeces Paired (PCB)	Discuss with a Microbiologist as other investigations may be required depending upon clinical history
Q Fever (Coxiella infection)	PCB for antibody tests if endocarditis suspected. Otherwise paired (PCB)	Send to Virology
Rabies	**DO NOT TAKE OR SEND SPECIMENS BEFORE CONSULTING A MEDICAL MICROBIOLOGIST OR VIROLOGIST**	Inform CCDC immediately the diagnosis is suspected
Respiratory syncytial virus (RSV)	Nasopharyngeal aspirate , Nose and throat swabs for PCR BAL Sputum	
Rheumatic fever	Blood (PCB) for ASO test	
Rickettsial infection	Blood (PCB)	Consult a Virologist. Full clinical details including travel history are essential to determine appropriate tests by the reference laboratory.
Rubella	Blood (PCB) for antibody tests	Clinical details are essential to determine the appropriate tests required.
SARS (severe acute respiratory syndrome)	**DO NOT TAKE OR SEND SPECIMENS BEFORE CONSULTING A MEDICAL MICROBIOLOGIST/ VIROLOGIST & INFECTION CONTROL**	Inform CCDC immediately the diagnosis is suspected
Schistosomiasis	Urinary - 3 complete specimens of urine in 150 ml containers taken between 1000h – 1400h Alternatively send a 24h collection of terminal urine. Rectal - 3 faeces specimens. Rectal biopsy. Blood (PCB) for antibody tests	Please discuss – depends on geographical risk 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

Septic arthritis	Blood cultures Joint aspirate Serial CRP measurements are useful for monitoring treatment	
Septicaemia	Blood cultures (see bacteraemia) Urine Relevant specimens from presumed primary focus if available	NB. If meningococcus is suspected, send an EDTA blood for PCR
Shingles	Vesicle fluid for PCR Vesicle swab	Discuss with a Virologist. Serology is not helpful.
Spontaneous Bacterial Peritonitis (SBP)	Ascitic fluid in plain sterile, leakproof container IN ADDITION – ascitic fluid may be inoculated into a blood culture set	Cell count and differential will only be performed if clinical details state SBP
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 in charcoal transport medium	
Trypanosomiasis	2.5 ml blood in EDTA Blood (PCB) for antibody test	Consult a Microbiologist.
Tuberculosis a) Respiratory b) Renal c) Other sites	 3 consecutive daily early morning specimens of sputum for AAFB Only send if patient has proven sterile pyuria, is immuno - compromised or after discussion with a medical microbiologist: 3 complete early morning specimens of urine Consult a Microbiologist.	 Large volume urine containers available from laboratory stores on request

Typhoid / paratyphoid	See enteric fever.	
Ulcers & pressure sores Ulcer-viral	Only recommended if associated pain, cellullitis, inflammation, discharge or pyrexia Take deep swab of the ulcer Swab in VTM if considering viral cause (HSV)	Cultures often contaminated with colonising flora. Topical cleansing is the treatment of choice unless associated cellulitis, inflammation, pain, discharge or pyrexia Common reservoir for MRSA
Urethritis	Aptima swab for chlamydia /gonorrhea NAAT Swab in charcoal transport medium 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	Pernasal transwab (thin wire) in charcoal transport medium NPA for PCR sent to reference laboratory if severe neonatal disease Blood for serology at reference laboratory	Available on request from laboratory
Worms/ Faecal Parasites eg Ascaris (roundworm) ,Ancylostoma or Necator (hookworm), Taenia (tapeworm), Clonorchis (liver fluke), Trichuris, Strongyloides Enterobius vermicularis (thread worm)	Send faeces with any relevant clinical details eg. 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 Send an early morning sellotape slide: Stick clear sellotape to perianal skin area, peel off and apply sticky surface to labelled microscope slide. Send slide with tape affixed in slide box	

Mesenteric adenitis / lymphadenitis, terminal ileitis, Reactive arthritis	Faeces for *Yersinia*	May present as acute appendicitis Please discuss first with a medical microbiologist

DEPARTMENTAL TELEPHONE NUMBERS

Public Health England, Bristol Public Health Laboratory , Myrtle Road, Kingsdown, Bristol BS2 8EL

General enquiries	**0117 342 5551**
Laboratory Fax.	**0117 922 6611**
Dr David Carrington, Clinical Services Director	0117 342 5017
Mr Will Gothard, Head of Operations	0117 342 5025
Mrs Jo Sell, Laboratory Manager	0117 342 5025
Mrs Elisabeth North, Quality Manager	0117 342 5023
Mrs Rose Young, Laboratory Administrator	0117 342 5024

Virology Department

Enquiries & Reports	0117 342 5551
Dr David Carrington, Clinical Services Director and Head of Virology	0117 342 5017
Dr Matthew Donati, Consultant Virologist	0117 342 5016
Dr Peter Muir, Consultant Clinical Scientist Dr Charles Irish, Consultant Clinical Virologist	0117 342 5042
Ms Jane Usher, Biomedical Head of Clinical Virology / Microbial Serology	0117 342 5023
Dr Barry Vipond, Molecular Virology	0117 342 5018

Mycology Department

Enquiries & Reports	0117 342 5028 / 5029
Dr Elizabeth Johnson, Head of Department	0117 342 5030
Mr Mike Palmer, Laboratory Manager	0117 342 5028

Food & Environmental Department

Enquiries & Reports	0117 342 5026

PHE Bristol Public Health laboratory Level 8, Bristol Royal Infirmary, BS2 8HW

Bacteriology Department

General Enquiries - Main Laboratory	0117 342 2514
	0117 342 2572
	0117 342 2569
Laboratory Fax.	**0117 929 9162**
Dr Martin Williams, Head of Bacteriology	0117 342 3454
Dr Richard Brindle Consultant Microbiologist	0117 342 3365
Dr Barbara Kirkpatrick, Consultant Microbiologist	0117 342 3241
Dr Ed Barton, Consultant Microbiologist	0117 342 3242
Mr Will Gothard, Head of Operations	0117 342 5025 / 2593 / 2514
Angela Pollard, Departmental Secretary	0117 342 2879
Mrs Jacki Watts, Biomedical Head of Clinical Bacteriology	0117 342 2593 0117 342 2514
Specialist Registrars	0117 342 2539 0117 342 3879 0117 342 2559
Dr Jiancheng Zhang, Clinical Scientist	0117 342 2557
Blood Culture Laboratory	0117 342 2565
Urine Laboratory	0117 342 2560
STD laboratory / Susceptibility Testing Laboratory	0117 342 2556
Preparation Room (orders/supplies)	0117 342 2573

Control of infection Unit, Level 8, BRI

All ICN Staff (via switchboard)

Jo Davies	0117 342 4057	
Stephanie Carroll	0117 342 4296	Bleep: 4946
Michelle Lindsay	0117 342 2570	Bleep: 3543
Carly Hall	0117 342 2570	Bleep: 6262
Karen Fletcher	0117 342 3868	Bleep: 3258
Aleli Viray	0117 342 3868	Bleep: 4940
Kathy Hole	0117 342 4296	Bleep: 3435
Tissue viability nurses	0117 342 24071	
Alex Clarke Secretary to all above	0117 342 24071/23696	

Royal United Hospital Bath

Enquiries & Reports	**01225 82 5428**
	01225 82 4747
Dr Rachel Mayer, Consultant Microbiologist	01225 82 1950
Dr Sarah Meisner, Consultant Microbiologist	01225 82 1172
Dr Mohammad Abrishami	01225 82 5433
Infection Control	01225 82 4754

Departmental Guidelines

The department has compiled many documents giving advice either on specific subjects or for specific users. These are available on the UHBristol and RUH intranet sites, or as hard copy or via E-mail, and may be accessed by contacting the named source:

1. **Antibiotic Prescribing Guidelines**
   - Dr Barbara Kirkpatrick, Level 8, BRI
   - Dr SJ Meisner, Dr S A Murray, RUH
2. **Guidelines for Accident and Emergency Department**
   Dr D Carrington
3. **RUH Infection Control Policies**
   Yvonne Pritchard, Infection Control Nurse Manager, RUH

See also the UHBristol Intranet, the RUH Intranet, and the PHE National website at www.phe.gov.uk

References

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

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

Appendix 2- Referred tests

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

Table of commonly used Bacteriology Reference laboratories

Tests referred	Name & Address of Referral Laboratory	Additional TAT to Bristol laboratory published times
Amoebiasis	Clinical Parasitology Department 3rd Floor The Hospital for Tropical Diseases Mortimer Market Capper Street London WC1E 6AU	Blood : 14 days Faeces; 7-14 days
Botulinum	Enteric Laboratory Food Safety Microbiology Lab PHE Colindale DX NO. 6530007 COLINDALE NW	Faeces: 7-14 days
Campylobacter Identification	Gastrointestinal Bacteria reference unit 61 Colindale Avenue LONDON DX No 6530008 COLINDALE NW	7-14 days
E. Coli 0157 Verotoxin & typing	Gastrointestinal Bacteria reference unit 61 Colindale Avenue LONDON DX No 6530008 COLINDALE NW	7-14 days
Meningococcal Reference (Typing)	Meningococcal Reference Unit Manchester Medical Microbiology DX NO. 6962410 MANCHESTER 90 M	2-14 days
Mycobacterium Tuberculosis ID and susceptibility	Mycobacterium Reference Laboratory Department of Medical Microbiology University Hospital of Wales Heath Park, Cardiff. CF14 4XW DX No 6070100 CARDIFF 90 CF	2-4 weeks
Mycobacterium Tuberculosis Fastrack PCR	National Mycobacterium Reference Laboratory, Abernethy Building, 2 Newark Street, Whitechapel London E1 2AT	1-3 days
Salmonella & shigella confirmation & typing	Gastrointestinal Bacteria reference unit 61 Colindale Avenue LONDON DX No 6530008 COLINDALE NW	14-28 days

Stronglyoides	Clinical Parasitology Department 3rd Floor The Hospital for Tropical Diseases Mortimer Market Capper Street London WC1E 6AU	7-14 days
Tetanus ID & toxin	Foodborne Pathogens Safety Unit PHE Colindale (FSMI) DX No 6530007 COLINDALE NW	7-14 days
Vibrio spp. confirmation & typing	Gastrointestinal Bacteria reference unit 61 Colindale Avenue LONDON DX No 6530008 COLINDALE NW	7-14 days
Yersinia typing	Gastrointestinal Bacteria reference unit 61 Colindale Avenue LONDON DX No 6530008 COLINDALE NW	7-14 days

Table of commonly used Virology and Microbial Serology Reference laboratories

Tests referred	Name & Address of Referral Laboratory	Additional TAT to Bristol laboratory published times
ACV Resistance	Virus Reference Unit PHE Colindale 61 Colindale Ave LONDON DX NO. 6530006 COLINDALE NW	14 days
Antistaphylococcal Antbodies	Laboratory of Healthcare Associated Infection PHE Colindale 61 Colindale Ave LONDON DX NO. 6530009 COLINDALE NW	7-14 days
Arbovirus & Rickettsia	Rare and Imported Pathogens Laboratory Centre for Applied Microbiology & Research Porton Down DX NO. 6930402 SALISBURY 92 SP	7-14 days
Bordetella antibody	Atypical Pneumonia Unit PHE Colindale SRMD (RSIL) DX NO. 6530011 COLINDALE NW	7-14 days
Cat-Scratch Antibodies	Atypical Pneumonia Unit Streptococcus & Diphtheria Unit 61 Colindale Avenue CFI (RSIL) DX No 6530011 COLINDALE NW	7-14 days
CJD	CJD Surveillance Unit Western General Hospital Crewe Road Edinburgh EH4 2XU	>14 days
Cysticercosis	Clinical Parasitology Department 3rd Floor The Hospital for Tropical Diseases Mortimer Market Capper Street London WC1E 6AU	14 days
Dengue Antibodies	Rare and Imported Pathogens Laboratory Centre for Applied Microbiology & Research Porton Down DX NO. 6930402 SALISBURY 92 SP	7-14 days

Diphtheria	Respiratory & Systemic Infection Laboratory Streptococcus & Diphtheria Unit PHE Colindale SRMD (RSIL) DX NO. 6530011 COLINDALE NW	Toxin: 1 day Final report: 7 days
E. Coli 0157 Antibody	Gastrointestinal Bacteria Reference Unit 61 Colindale Avenue LONDON DX No 6530008 COLINDALE NW	7-14 days
Enterovirus IgM	Microbiology dept St Helier Hospital Carshalton DX No 6600101	7-14 days
Filaria Serology	Clinical Parasitology Dept 3rd Floor The Hospital for Tropical Diseases Mortimer Market Capper Street London WC1E 6AU (DX No. 6640701)	14 days
Ganciclovir Resistance	Antiviral Sus/Ref Laboratory Health Protection Agency Birmingham Heartlands Hospital Bordesley Green East DX NO 6780100 BIRMINGHAM B	14 days
Haemophilus Antibodies	Haemophilus Reference Unit Immunology Department Churchill Hospital Headington Oxford OX3 7LJ	7-14 days
Hantavirus Antibodies	Rare and Imported Pathogens Laboratory Centre for Applied Microbiology & Research Porton Down DX NO. 6930402 SALISBURY 92 SP	7-14 days
HBV DNA	Sexually Transmitted & Blood Borne Virus Lab PHE Colindale SRMD (SBVL) DX NO. 6530006 COLINDALE NW	14 days
HBV (Staff) DNA	Public Health Laboratory Birmingham Heartlands Hospital Bordesley Green East DX NO 6780100 BIRMINGHAM B	3-4 weeks

HCV Viral Load	Sexually Transmitted & Blood Borne Virus Lab PHE Colindale SRMD (SBVL) DX NO. 6530006 COLINDALE NW	14 days
HDV Serology	Sexually Transmitted & Blood Borne Virus Lab PHE Colindale SRMD (SBVL) DX NO. 6530006 COLINDALE NW	7- 14 days
HEV Serology	Sexually Transmitted & Blood Borne Virus Lab PHE Colindale SRMD (SBVL) DX NO. 6530006 COLINDALE NW	7- 14 days
Human Herpes Virus 8	Sexually Transmitted & Blood Borne Virus Lab PHE Colindale SRMD (SBVL) DX NO. 6530006 COLINDALE NW	7- 14 days
HIV Resistance Testing	Public Health Laboratory Birmingham Heartlands Hospital Bordesley Green East DX NO 6780100 BIRMINGHAM B	7- 14 days
Hydatid Serology	Clinical Parasitology Department 3rd Floor The Hospital for Tropical Diseases Mortimer Market Capper Street London WC1E 6AU	Blood: 14 days
JC PCR	Virus Reference Laboratory Immunisation & Diagnosis Unit 61 Colindale Avenue LONDON DX No 6530006 COLINDALE NW	7- 14 days
Legionella Antibodies	Legionella Reference Unit Atypical Pneumonia Unit PHE Colindale SRMD (RSIL) DX No 6530011 COLINDALE NW	7- 14 days
Legionella (Urine For Culture)	Legionella Reference Unit Atypical Pneumonia Unit PHE Colindale SRMD (RSIL) DX No 6530011 COLINDALE NW	(Preliminary report 2 days) Confirmation report: 7- 14 days

Leishmaniasis serology	Clinical Parasitology Department 3rd Floor The Hospital for Tropical Diseases Mortimer Market Capper Street London WC1E 6AU	7- 14 days
Leptospirosis	Leptospirosis Reference Laboratory County Hospital Hereford DX No 6120600 HEREFORD 90 HR	7- 14 days
Lyme PCR	Southampton PHE Lyme Disease Ref Unit Level B South Lab Block S'ton General Hospital DX 6880300 SOUTHAMPTON 90 SO	7- 14 days
Lyme serology (confirmation testing)	Rare and Imported Pathogens Laboratory PHE Porton down Salisbury Wiltshire SP4 0JG DX 6930400 Salisbury 92 SP	7-14 days
Measles PCR	Division of Hospital Infection Immunisation & Disease Unit PHE Colindale SRMD (VRD) DX NO. 6530006 COLINDALE NW	7 days
Meningococcal Reference (PCR)	Meningococcal Reference Unit Manchester Medical Microbiology DX NO. 6962410 MANCHESTER 90 M	Phoned report 2days Final report 5-7 days
Onchocerciasis	Clinical Parasitology Department 3rd Floor The Hospital for Tropical Diseases Mortimer Market Capper Street London WC1E 6AU	7- 14 days
Pneumococcal Antibodies	Pneumococcal Reference Unit Manchester Medical Microbiology DX NO. 6962410 MANCHESTER 90 M	7-14 days
Pneumococcal PCR	Pneumococcal Reference Unit Manchester Medical Microbiology DX NO. 6962410 MANCHESTER 90 M	Phoned report 2days Final report 5-7 days

Polio Serology	Enteric & Respiratory Virus Laboratory PHE Colindale DX NO. 6530006 COLINDALE NW	7-14 days
Polyoma Antibodies	Virus Reference Laboratory CFI (VRD) 61 Colindale Avenue LONDON DX No 6530006 COLINDALE NW	7-14 days
Pseudomanas Antibodies	Laboratory Healthcare Associated Infection 61 Colindale Avenue DX 6530009 COLINDALE NW	7-14 days
Rabies Antibodies	Animal Health & Veterinary Laboratories Agency (AHVLA) Woodham Lane Weybridge SURREY KT15 3NB	7-14 days
Salmonella	Gastrointestinal Bateria Reference unit 61 Colindale Avenue LONDON DX No 6530008 COLINDALE NW	7-14 days
SARS	Enteric & Respiratory Virus Laboratory PHE Colindale DX NO. 6530006 COLINDALE NW	7-14 days
Schistosomiasis	Clinical Parasitology Department 3rd Floor The Hospital for Tropical Diseases Mortimer Market Capper Street London WC1E 6AU	7-14 days
Strongyloides	Clinical Parasitology Department 3rd Floor The Hospital for Tropical Diseases Mortimer Market Capper Street London WC1E 6AU	7-14 days
Tetanus	Legionella Reference Laboratory Streptococcus & Diphtheria Unit PHE Colindale SRMD (RSIL) DX No 6530011 COLINDALE NW	7-14 days

Toxocariasis	Clinical Parasitology Department 3rd Floor The Hospital for Tropical Diseases Mortimer Market Capper Street London WC1E 6AU	7-14 days
Toxoplasmosis	NPHS Microbiology Singleton Hospital Swansea DX No 6070300 SWANSEA 90 SA	7-14 days
Toxoplasmosis PCR	NPHS Microbiology Singleton Hospital Swansea DX No 6070300 SWANSEA 90 SA	7-14 days
Trichinella CFT	Clinical Parasitology Department 3rd Floor The Hospital for Tropical Diseases Mortimer Market Capper Street London WC1E 6AU	7-14 days
Trypanosomiasis	Clinical Parasitology Department 3rd Floor The Hospital for Tropical Diseases Mortimer Market Capper Street London WC1E 6AU	7-14 days
Typhoid Antibodies	Gastrointestinal Reference Unit 61 Colindale Avenue LONDON DX No 6530008 COLINDALE NW	7-14 days
Typhus	Rare and Imported Pathogens Laboratory Centre for Applied Microbiology & Research Porton Down DX NO. 6930402 SALISBURY 92 SP	7-14 days
Rift Valley Fever	Rare and Imported Pathogens Laboratory Centre for Applied Microbiology & Research Porton Down DX NO. 6930402 SALISBURY 92 SP	7-14 days

West Nile Fever	Rare and Imported Pathogens Laboratory Centre for Applied Microbiology & Research Porton Down DX NO. 6930402 SALISBURY 92 SP	7-14 days
Whipples	Microbiology Great Ormond Street Hospital London DN NO. 6640203 BLOOMSBURY 91 WC	7-14 days
Yellow Fever	Special Pathogens Reference Laboratory Centre for Applied Microbiology & Research Porton Down DX NO. 6930402 SALISBURY 92 SP	7-14 days
Yersinia	Laboratory of Gastrointestinal Pathogens 61 Colindale Avenue LONDON DX No 6530008 COLINDALE NW	7-14 days

Validation & Review Sheet

This is the current version **(5.0)** of the **Bristol PHE Laboratory User Manual** and supersedes **ALL** previous versions as of **September 2013**

Signature of Consultant: David Carrington

Date: September 2013

Version	*Signature*	*Name*	*Date*