Microbiology Handbook: Royal United Hospitals Bath

1. Background

The Public Health England (PHE) 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 and operates under the organisational title: Severn Pathology Services:

The Southmeads (North Bristol Trust) site houses the Infection Sciences Service. This department accepts many hundreds of specimens daily for bacteriological investigation.

The Myrtle Road site, near Bristol Royal Infirmary, houses the Virology department, which provides a clinical Virology service to UHBristol and RUHT. This laboratory also provides both regional and national specialist tests and Mycology reference services.

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.

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

Royal United Hospital Bath Clinical Team

The Clinical Team consists of:
Dr Rachel Mayer – Consultant Medical Microbiologist
Dr Sarah Meisner – Consultant Medical Microbiologist
Dr Jane Liu – Consultant Medical Microbiologist
Dr Julia Vasant - Consultant Medical Microbiologist

The RUH Bath Laboratory is open as follows:
Monday – Friday  09.00h – 17.00h
Saturday   08.30h – 16.30h
Sunday   08.30h – 16.30h

To contact the laboratory please use the following:
Testing/sample advice and results: 01225 824747 (xt 4747 internal)
Clinical Advice (From Consultant Microbiologist): 01225 825428 (xt 5428 internal)

2. Royal United Hospital, Bath Onsite Laboratory repertoire

The satellite laboratory at the RUH performs a restricted range of tests on-site. The majority of specimens are transferred to the PHE Bristol Laboratory for processing. The on – site repertoire includes:
• Clinical advice / Infection Control advice

Routine bacteriological examination (microscopy and culture) of the following clinical specimens:

• Blood culture
• Cerebrospinal Fluid
• Environmental Monitoring (Pharmacy)
• Susceptibility testing
• Urgent specimens (Tissue, fluids) (except faeces, sputa or suspected category 3 or 4 organisms)

2.1 Onsite testing

The laboratory also offers a Rapid Molecular (PCR) testing service for Hospital Inpatient Clostridium Difficile, Norovirus and Flu A/B/ RSV specimens.

2.2 Specimen

C. difficile and Norovirus
A fresh Bristol stool chart Type 5-7 (diarrhoeal) patient specimen should be sent to RUH Pathology laboratory in a standard Blue Topped faecal MC&S pot ¼ full with specimen (approx. 10-25ml).

A Vomit specimen (not salivary) specimen should be sent to RUH Pathology laboratory in a standard sterile Universal MC&S pot ¼ full with specimen (approx. 10-25ml).

Flu A/B RSV

An Oropharyngeal (Throat) Swab or Naso Pharyngeal Aspirate (NICU only) should be sent to RUH Pathology laboratory using a red Copan viral transport media swab.

Appendix 1 (page 8) shows which specimens to take/requests to make – either Rapid PCR only or Rapid PCR and Respiratory virus Panel

2.3 Requesting a specimen and hours of service

These tests should be requested on Millennium and labelled with millennium labels.

Please use:
Norovirus PCR (Bath)
C. difficile Screen PCR (Bath)
Rapid influenza A/B RSV PCR

The service will be available 7days a week at the following times -

Mon-Fri: Results will be available ‘same day’ for specimens arriving at laboratory during normal working hours (up to 17.00). Results for specimens arriving after this will be available the following morning.

Sat-Sun: Results will be available ‘same day’ for specimens arriving at laboratory up to 13.30. Results for specimens arriving after this will be available the following morning. Please note -
• **Specimens should only be sent to the Lab for these tests up until 20.00 (8pm).**

• **From 8pm PLEASE KEEP SPECIMENS AT REQUESTING LOCATION AND SEND TO LABORATORY FROM 08.00A.M. ONWARDS.**

• **Specimens for faecal MC&S (ie not C Difficile or Norovirus) should be sent in a different specimen bag (as these are sent on to PHE Bristol Lab).**

• **Specimens for ‘Respiratory virus PCR panel’ should be sent in a different specimen bag (as these are sent on to PHE Bristol Lab).** See: Severn Pathology Infection Sciences User manual link, below.

### 2.4 Expected Results

<table>
<thead>
<tr>
<th>TEST</th>
<th>PCR result</th>
<th>Supplementary test</th>
<th>Overall Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. difficile</td>
<td>PCR Negative</td>
<td>n/a</td>
<td>Negative</td>
</tr>
<tr>
<td>C. difficile</td>
<td>PCR Positive</td>
<td>Toxin Negative</td>
<td>Colonised</td>
</tr>
<tr>
<td>C. difficile</td>
<td>PCR Positive</td>
<td>Toxin Positive</td>
<td>C. difficile Infection</td>
</tr>
<tr>
<td>Norovirus</td>
<td>PCR Negative</td>
<td>n/a</td>
<td>Norovirus Negative</td>
</tr>
<tr>
<td>Norovirus</td>
<td>PCR Positive</td>
<td>n/a</td>
<td>Norovirus Positive</td>
</tr>
<tr>
<td>Flu A</td>
<td>PCR Negative</td>
<td>n/a</td>
<td>Flu A Negative</td>
</tr>
<tr>
<td>Flu A</td>
<td>PCR Positive</td>
<td>n/a</td>
<td>Flu A Positive</td>
</tr>
<tr>
<td>Flu B</td>
<td>PCR Negative</td>
<td>n/a</td>
<td>Flu B Negative</td>
</tr>
<tr>
<td>Flu B</td>
<td>PCR Positive</td>
<td>n/a</td>
<td>Flu B Positive</td>
</tr>
<tr>
<td>RSV</td>
<td>PCR Negative</td>
<td>n/a</td>
<td>RSV Negative</td>
</tr>
<tr>
<td>RSV</td>
<td>PCR Positive</td>
<td>n/a</td>
<td>RSV Positive</td>
</tr>
</tbody>
</table>

*Note: Rapid influenza A/B RSV will display results for each of Flu A, Flu B and RSV as individual tests.*

Due to the duplicate testing required for some patient groups (i.e. Rapid influenza A/B RSV PCR and Respiratory virus PCR panel) – see appendix 1 – discrepant results may be generated. In this case the POS (positive result) will take precedence.

### 2.5 Specimen retention

All Specimens will be kept in the laboratory for 7 days after testing and are available for re-testing or further testing.

C. difficile PCR Positive specimens are kept for at least 28 days and are available for re-testing, further testing and Ribotyping upon request.

### 3. Specimen Transport

The remaining routine inpatient, outpatient and GP specimens from the area are transported from RUH Bath Laboratory to the Bristol Laboratories four times a day: At 0900h, 1300h, 1500h and 1700h. For full repertoire please see Severn Pathology Infection Sciences User manual.

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 RUH Bath Laboratory reception to PHE Bristol laboratory 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:

<table>
<thead>
<tr>
<th>Time</th>
<th>Collection time from Bath</th>
<th>Arrival time at Bristol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mondays to Friday</td>
<td>0900h 1300h 1500h 1700h</td>
<td>1000h 1400h 1600h 1800h</td>
</tr>
<tr>
<td>Weekends (Sat and Sun/Bank holidays)</td>
<td>0915h – 0930h</td>
<td>1000h – 1030h</td>
</tr>
</tbody>
</table>

Samples which are received in the RUH Pathology department after the stated times will be sent on the next available transport. Please note that, 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 PHE Bristol Laboratory for processing out of hours or at weekends e.g. BAL specimens. Packaging and transport of these specimens should be arranged through the on call BMS via the RUH switchboard. Clinical discussion about the patient with the Consultant Medical Microbiologist on call may also be helpful.

4. Specimen Labelling

All specimens must be received in appropriate containers, sealed in a plastic bag with the request form in a separate compartment. ALL sections of the request form MUST be completed and relevant clinical information provided. Incomplete data may result in significant delays and/or inappropriate processing.

For information on:
- Specimen collection (general guidance)
- Electronic requesting (ICE requests)
- Paper Request Forms (including which forms to use)
- Labelling of Specimens
- Rejection policy

(see the PHE Bristol Laboratory User manual p12-17)

5. Specimen Type Required

- For detailed explanation of Collection of specimens (technique) and Interpretation of Results see PHE Bristol User manual p27-52.
- For quick reference (table) of appropriate specimen type and appropriate container see PHE Bristol Laboratory User manual p52-62
6. Clinical Advice

The following Local Trust antibiotic guidance is available:

- Clostridium Difficile Guideline
- Dosing and Monitoring of Gentamicin Vancomycin and Teicoplanin
- Elispot testing
- Empirical treatment of infections in adults
- Empirical use of antibiotics in children and neonates
- Interim antifungal guidance for haematology patients
- Periorbital cellulitis in children guideline
- Prophylaxis for asplenic and hyposplenism in adults
- Surgical prophylaxis

Please use this local guidance in the first instance, available on the intranet via the following link:
http://webserver.ruh-bath.swest.nhs.uk/clinical_directory/clinical_guidelines/antibiotic.asp?menu_id=1

The Microbiology Consultants are very happy to discuss complex clinical queries but would be grateful if teams could review results and discuss management within the hierarchy of their own clinical teams before telephoning.

A Duty Medical Microbiologist is available on-site between 9am and 5pm: Call 01225 825428.

An On-Call Medical Microbiologist is available out of hours via the RUH switchboard.

Note that the on-call Microbiologist may not be an RUH based doctor. Please consider whether your query could wait to be discussed with an RUH based Microbiologist the following day. If it does require urgent discussion, ensure that you have all the necessary information to hand before phoning the on-call doctor.

7. 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 e.g. TB, typhoid and paratyphoid, brucellosis, should be clearly labelled “DANGER OF INFECTION” on both the form and specimen. This is especially important when sending specimens of tissue, blood or other body fluids. This requirement enables the laboratory staff to implement immediate, appropriate prophylaxis and advice should an accident occur.

Certain organisms are classified as being serious biohazards. Information can be found at 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)
8. Out of Hours (on-call) service

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

Contact via the RUH switchboard (01225 428331) and ask for:
- Biomedical Scientist for specimen processing
- On-Call Consultant Microbiologist for clinical advice

It is not necessary to contact the on-call BMS regarding blood cultures which should be kept at room temperature, not refrigerated, before sending to the laboratory.

9. Public Holiday Arrangements

The Laboratory service is not available for routine work or enquiries but will provide an on-call service for urgent requests only. Please contact the RUH Bath laboratory (bacteriology) or BRI switchboard (virology) using the above out of hours arrangements.

It is advisable not to submit bacteriology samples over a Public Holiday weekend and 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.

10. Urgent Specimen Requests

If results are required to assist with urgent clinical decisions, the laboratory must be notified by telephone, during normal working hours (xt4747) or out of hours via switchboard (see below).

Without such notification the specimen will not be prioritised and likely be processed as non-urgent. Please mark the request form (if used) as ‘URGENT using the “Urgent ICE label”. If none are available they can be obtained from Pathology stores (xt4724). Please also mark the bag containing the sample to indicate that the sample is 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 (which may cause considerable delay in the availability of the result).

Bottles and containers that are unavailable on the ward can be obtained from Pathology stores xt 4724.

11. Antibiotic Assay

Gentamicin, tobramycin 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 (see below for link).

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 RUH laboratory by
1100h to ensure same day processing. Assays arriving after this time will be processed the following day (LTT – 0.5 days). Completed test results are available on OpenNet Patient Reports in ICE.

Assays for antifungal agents are discussed on PHE Bristol Laboratory User manual p41

12. Microbiology Results Enquiries

Please restrict these as far as possible for results that are not yet available. As soon as results are completed and authorised they should be available. Results should be accessible for all RUH users via the ULTRA Laboratory computer system and is the recommended method of accessing all patient results. All results, however requested, are also available in ICE. Accessing results in this way is quicker, more secure and accurate and ultimately faster than telephoning the laboratory.

The Laboratory Turnaround Times (LTT) for microbiology specimens are given in the PHE Bristol Laboratory User manual p27-52 for all tests (please check before enquiring)

If a result is required on an incomplete test, this should be requested from the Bristol Laboratory on 0117-342-2514 (Microbiology) or 0117-342-5012 (Virology). For other result enquiries the RUH Bath Laboratory Microbiology secretary can be contacted on 01225 825428.

Please note that urgent virology results may not be available on the computer until the next working day, but significant results will be telephoned.

13. Infection Control Advice

Local Trust Infection Control policies are available on the intranet via the following link:

http://webserver.ruh-bath.swest.nhs.uk/clinical_directory/clinical_guidelines/antibiotic.asp?menu_id=1

(includes: Infection control policies, Other infection control policies, Trust guidelines for treatment of HIV infected adults)

The Infection Control Nurses are available on site between 9am and 5pm on 01225 825450 or 01225 428331 and bleep 7991.

Out of hours infection control advice can be sought from the on call Medical Microbiologist via the RUH switchboard (01225 428331).

• 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.
For sending potentially radioactive samples, medico-legal specimens and tissue samples from deceased people please refer to PHE Bristol Microbiology User manual p16-17.

Appendix 1: DECISION TREE FOR FLU PCR testing at RUH

**Rapid influenza A/B RSV PCR** = In-house rapid PCR for flu A/B and RSV. Millennium request: Rapid Influenza A/B RSV PCR.

**Respiratory virus PCR panel** = PHE Bristol lab PCR panel for Flu A/B, RSV, parainfluenza 1-3, metapneumovirus, adenovirus and rhinovirus. Millennium request: Respiratory virus PCR panel

Oropharyngeal (Throat) Swab or Naso-Pharyngeal Aspirate* for patients with clinically suspected:
- Flu (ADULTS)
- Flu/RSV (PAEDS, NICU*)
**Senior clinician = Consultant microbiologist or Consultant physician/Registrar