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, (UH Bristol) the Royal United Hospital Bath NHS Trust (RUH) and for the many GP practices in the South Bristol and Bath areas. The laboratory is accredited by UK Accreditation Service (UKAS) board, giving an assurance of quality. It is located over three different sites and operates under the organisational title: Severn Pathology Services:

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

The Myrtle Road site, near Bristol Royal Infirmary, houses the Mycology reference services.

The Royal United Hospital (RUH), Bath site houses a small satellite laboratory, in B38, 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 Sarah Meisner – Consultant Medical Microbiologist
- Dr Jane Liu – Consultant Medical Microbiologist
- Dr Julia Vasant - Consultant Medical Microbiologist
- Dr Emma Boldock- Consultant Medical Microbiologist
- Katy Lomas- Laboratory Manager
- Julie Phelps- Microbiology Secretary
- Siobhan Bianco- Microbiology Secretary

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 (x 4747 internal)
Clinical Advice (From Consultant Microbiologist): 01225 825428 (x 5428 internal)

Out of hours please contact the on call Biomedical Scientist or Microbiologist via switchboard.
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 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).

Flu A/B RSV

An Oropharyngeal (Throat) Swab should be sent to RUH Pathology laboratory using a red Copan viral transport media swab.

Appendix 1 (page 9) shows which specimens to take/requests to make – either Rapid PCR only or 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 (Bath)

The service will be available 7 days 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 13.00.

Results for specimens arriving after this will be available the following morning.
Lab operating hours may vary during times of outbreak, please liaise with the lab, ICN and the trust during these times.

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 (i.e. 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.*

### 2.5 Specimen retention

All Negative Specimens will be kept in the laboratory for 14 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.

Norovirus positive samples will be stored for at least 28 days and are available for re-testing or further testing.

In house Respiratory PCR positive samples will be stored for 2-3 months and are available for re testing or further testing.

### 2.5.1 Time limit for add ons

Specimen retention times provides the basis for the time limit to add ons tests for Norovirus or C. difficile – see above.
3. Specimen Transport

Internal transport of samples at the Bath site is undertaken by 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 or hospital pneumatic tube system.

Transport of the remaining inpatient, outpatient and GP specimens from the area are transported from RUH Bath Laboratory reception to PHE Bristol laboratory by the PHE van drivers, and occur 4 times a day on weekdays and once a day, via courier at weekends. Departure times from Bath are:

<table>
<thead>
<tr>
<th>Collection time from Bath</th>
<th>Arrival time at Bristol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mondays to Friday</td>
<td></td>
</tr>
<tr>
<td>0900h</td>
<td>1000h</td>
</tr>
<tr>
<td>1300h</td>
<td>1400h</td>
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<tr>
<td>1500h</td>
<td>1600h</td>
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<tr>
<td>1700h</td>
<td>1800h</td>
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<tr>
<td>Weekends (Sat and Sun/Bank holidays) Couriers</td>
<td>0915h – 0930h</td>
</tr>
<tr>
<td></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. For full repertoire please see Severn Pathology Infection Sciences User manual.


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 (Millennium (Trust users) or ICE (GPs) requests)
Paper Request Forms (including which forms to use)
Labelling of Specimens
Acceptance & Rejection Policy

(See the PHE Bristol Laboratory User manual pg.12-17, or for RUH requests http://www.ruh.nhs.uk/pathology/requesting/index.asp?menu_id=1).
5. Specimen Type Required

- For detailed explanation of Collection of specimens (technique) and Interpretation of Results see PHE Bristol User manual, pg.27-52.
- For quick reference (table) of appropriate specimen type and appropriate container see PHE Bristol Laboratory User manual, pg.52-62

6. Interfering substances

For testing completed by PHE, interfering substances will be listed as part of the PHE Bristol Laboratory User Manual).

For Norovirus and C. difficile, interfering substances include blood, excess faeces and mucus.
For Flu/RSV, interfering substances in the nasopharynx, including blood, nasal secretions or mucus, nasal and throat medications used to relieve congestion, nasal dryness, or asthmas and allergy symptoms, as well as antibiotics and antivirals.

7. 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 825 428.

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.
8. High Risk Specimens

“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 are covered by this Policy.

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)
- Middle East respiratory syndrome coronavirus (MERS-CoV)
- TB
- Viral Haemorrhagic Fever (VHF)

If concerned regarding any of the above or foreign travel please contact the Clinical Consultant Microbiologist.

9. 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) 428 331) and ask for:
- Biomedical Scientist for specimen processing
- On-Call Consultant Microbiologist/ Virologist 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.

10. 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.

11. Urgent Specimen Requests

If results are required to assist with urgent clinical decisions, the laboratory must be notified by telephone, during normal working hours (x4747 or (01225) 824 747) or out of hours via switchboard (see below). Without such notification the specimen will not be prioritised and likely be processed as non-urgent. All flu requests are considered urgent, regardless of the requesting location.

Bottles and containers that are unavailable on the ward can be obtained from Pathology stores x4724. Stock order before midday will be available to collect the same day.
12. 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.

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 11.00 to ensure same day processing. Assays arriving after this time will be processed the following day (TAT = 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 pg. 41.

13. Microbiology Results Enquiries

Please restrict these as far as possible for results that are not yet available through Millennium (Trust users) and ICE (GP users). As soon as results are completed and authorised they should be available.

The Laboratory Turnaround Times (TAT) for microbiology specimens are given in the PHE Bristol Laboratory User manual pg. 27-52 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) 414 62 22 (Microbiology and Virology) by following the options. For other result enquiries the RUH Bath Laboratory Microbiology secretary can be contacted on (01225) 825 428.

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

14. 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, Trust guidelines for treatment of HIV infected adults)

The Infection Control Nurses are available on site between 9am and 5pm on (01225) 825 450 or 01225 428 331 and bleep 7991.

Out of hours infection control advice can be sought from the on call Medical Microbiologist via the RUH switchboard ((01225) 428 331).

• 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.

For sending potentially radioactive samples, medico-legal specimens and tissue samples from deceased people please refer to PHE Bristol Microbiology User manual pg.16-17.
**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, Human metapneumovirus, adenovirus and rhinovirus. Millennium request: Respiratory virus PCR panel

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**Senior clinician** = Consultant microbiologist or Consultant physician/Registrar.

Please note: Only Oropharyngeal (throat) swabs can be tested by Rapid influenza A/B RSV PCR, other sample types will need to be processed by the respiratory virus PCR panel.