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1 Introduction to Microbiology

Services Provided

The Microbiology Department provides a comprehensive service for Bacteriology, Virology, Parasitology, Mycology, Serology and Infection Control. Clinical advice is available from Medical Microbiologists and Advanced Practitioners.

Since the department receives a large number of specimens each year, laboratory efficiency depends to a large extent on user cooperation. User compliance with a few rules concerning safety, specimen identification and transport will greatly help the laboratory to deliver the service needed by Users.

This handbook outlines all the information required to use the service. However, please feel free to contact the laboratory to discuss any problems or issues that may arise. Any comments or suggestions about the User Handbook should be addressed to the Head Biomedical Scientist or Quality lead.

The department may refer some tests externally. Please see section 9 for further details.

Service Scope

The Microbiology department is a UKAS (United Kingdom Accreditation Service) accredited medical laboratory, number 9896. Our accreditation is limited to those activities described on our UKAS Schedule of Accreditation found here: https://search.ukas.com/#/tabbed/search?q=Birmingham%20Women%27s&ati=1

Service Standards/Quality Assurance

The Microbiology department recognises its responsibility as a provider of quality services. To this end, the laboratory has developed and documented a quality management system to better satisfy the needs of its users and to improve the management of the organisation. The quality system complies with UKAS International Accreditation ISO standards 15189:2012.

The laboratory aims to be a model of excellence in the delivery of a clinical Microbiology service. In order for this to be achieved, the laboratory is committed to the following:

- Service user involvement
- Good professional practice & evidence-based practice
- Efficient utilisation of resources
- Valuing our staff in order to realise their full potential
- Commitment to the health, safety and welfare of our patients, staff and visitors
- Keeping a safe environment in compliance with current environmental legislation
- Working as teams and partnerships
- Continuous improvement

The staff who work within the department are fully qualified, specialised and experienced, providing a quality service.

Quality Policy: We have a departmental Quality Policy (please see Appendix 4)

The quality of our service is maintained by recognised effective internal quality control measures and by participation in the following National External Quality Assurance (EQA) Schemes:
In addition, the laboratory also participates in Inter-laboratory Comparison schemes for Automated Urine Microscopy Analysis.

**Service Commitment**
The laboratory aims to be a model of excellence in the delivery of a clinical Microbiology service. In order for this to be achieved, we are committed to the following:
- Service user involvement
- Good professional practice & evidence-based practice
- Efficient utilisation of resources
- Valuing our staff in order to realize their full potential
- Commitment to the health, safety and welfare of our patients, staff and visitors
- Keeping a safe environment in compliance with current environmental legislation
- Working as teams and partnerships
- Continuous improvement

The purpose of this handbook is to provide information on the microbiology laboratory service including test repertoire, specimen requirements and details on accessing our service. It also provides
- Laboratory contact details
- Location of laboratory
- Opening hours (including the out of hours service)
- Details of services provided
- Instructions for completing sample and request form information
- Arrangements for transporting samples to the laboratories

**Intended Audience**
All users of Microbiology laboratory services at Birmingham Women’s and Children’s Hospital
Service user feedback is welcomed and any problems regarding the quality of the service should be brought to the attention of Philip Milner (Head Biomedical Scientist) on extension 9809 or email philip.milner1@nhs.net.
## Useful Contacts

<table>
<thead>
<tr>
<th>Microbiology Contacts</th>
<th>Phone No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Enquiries</td>
<td>9803</td>
</tr>
<tr>
<td>Pathology Manager</td>
<td>9835</td>
</tr>
<tr>
<td>Microbiology Section Manager</td>
<td>9809</td>
</tr>
<tr>
<td>Quality Lead / Senior Biomedical Scientist</td>
<td>9802/9803</td>
</tr>
<tr>
<td>Training Lead / Senior Biomedical Scientist</td>
<td>9802/9803</td>
</tr>
<tr>
<td><strong>Main Laboratory (please use General Enquiries number for results)</strong></td>
<td>9802</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Consultant and Advanced Laboratory Practitioners</th>
<th>Phone No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr Jim Gray</td>
<td>9815</td>
</tr>
<tr>
<td>Dr Mitul Patel (Clinical Lead)</td>
<td>9814</td>
</tr>
<tr>
<td>Registrar</td>
<td>9818</td>
</tr>
<tr>
<td>Mr Phil Milner</td>
<td>9809</td>
</tr>
<tr>
<td>Infection Control</td>
<td>9968/9966</td>
</tr>
<tr>
<td></td>
<td>Bleep 55047</td>
</tr>
</tbody>
</table>
3 Information Governance

Data Protection
Information is a vital asset both in terms of the clinical management of individual patients and the efficient management of services and resources. It plays a key part in clinical governance, service planning and performance management.

Your personal data is data which by itself or with other data available to us can be used to identify you. We are Birmingham Women’s and Children’s NHS Foundation Trust, the data controller. Our Trust is registered with the Information Commissioner’s Office (ICO) to process personal and special categories of information under the General Data Protection Regulation (GDPR) and Data Protection Act 2018 (subject to parliamentary approval) and our registration number is Z6078102.

The department complies with the Trust policies relating to the handling, use and protection of personal information (add document here)

- We only ask for information that we need to allow interpretation of results
- We protect the information and ensure only those staff who need to see the information can access it
- We share the information only when we need to for patient case, for example sending the information to another laboratory for testing
- The data will be stored in accordance with 'The retention and storage of pathological records and specimens' (5th edition) Guidance from The Royal College of Pathologists and the Institute of Biomedical Science, April 2015. We do not store any information for any longer than is absolutely necessary.

For more information, please click on the following link to read the Trusts Privacy Policy. This data protection and privacy policy sets out how we will use your personal data when you access our website. You can contact our Data Protection Officer at Birmingham Children’s Hospital, Steelhouse Lane, Birmingham B4 6NH if you have any questions.

https://bwc.nhs.uk/privacy-policy

Complaints
Pathology Services operates a complaints system in line with the Trusts Complaints Policy ‘Making Experiences Count Policy’.

Complaints, comments or feedback regarding the services provided by pathology can be made verbally or in writing (letter or email). Please contact the Pathology Services Manager or the Quality Manager.

If you have any concerns, comments, suggestions for improvement or compliments regarding any aspect of the Microbiology department, please contact the Head BMS (ext. 9809) or speak to one of the Senior Biomedical Scientists (9802).

If you feel that your concerns have not been put right you can make a formal complaint:

https://bwc.nhs.uk/complaints
4 Service Location & Availability

Location of the Department
The laboratories at Birmingham Children’s Hospital are located on Whittall Street. The Microbiology laboratory is located on the second floor of the Laboratory Block, next to Histopathology. The Laboratory Block is signposted off the Rainbow corridor connecting the laboratories with the Main Hospital Corridor.

Laboratory postal address
Dept. of Microbiology
Paediatric Laboratory Medicine
Birmingham Children’s Hospital
Steelhouse Lane
Birmingham
B4 6NH

Delivery address for couriers
Pathology Reception
Dept. of Microbiology
Paediatric Laboratory Medicine
Birmingham Children’s Hospital
Whittall Street
Birmingham
B4 6DH

Service Hours
Microbiology operates a 7-day service.

Normal Working Hours
The Microbiology department is open from
- Monday to Friday, 8:30 to 20:00.
- Saturday, Sunday and Bank Holidays 8:30 to 5:00

Samples for culture are dealt with until half an hour before closing, all antibiotic assays should reach the laboratory at least an hour before closing.

Please note that at weekends only two technical staff are present in the laboratory and on weekdays only one technical staff member is in after 17:00. Therefore please do not make telephone requests for patient results unless absolutely necessary- use ICE wherever possible.
Out of Hours Service

The Microbiology department provides an emergency out of hour’s service. This runs from 20:00 until 8:30 the following morning every day of the week.

Urgent requests should be restricted to those occasions where the results are essential for the immediate management of the patient. Convenience or interest, do not justify the increased work or cost of urgent analyses. All urgent requests (day or night) must be authorised by a doctor and legibly signed by them (not medical students or nurses). Laboratory staff will reserve the right to challenge the need for such requests. Failure to complete the request form fully may lead to delay.

For urgent clinical/infection control advice, please contact the On-call Microbiology Consultant through the switchboard.

For urgent specimen processing, the doctor making the request must contact the On-call Microbiology Technical Staff through switchboard. This should be done after the sample has been taken and before sending it to the laboratory.

Please note, there are no members of staff within the laboratory out of hours. Staff members will have to travel into the hospital in order to process the urgent sample.

Due to the Microbiology laboratory not being manned, the pod system is turned off between 20:00 and 08:30. Therefore, please pod specimens to Clinical Chemistry on station 200 during these times.

The following tests are routinely available out of hours:

- Microscopy & culture of CSF.
- Microscopy & culture of abscess material from intra-abdominal abscesses, chest abscesses, brain abscesses, or other deep seated infections.
- Microscopy & culture of pericardial fluid, pleural fluid, peritoneal dialysis fluid and joint fluid.
- Microscopy & culture of biopsies, and other samples taken during surgery.
- Gastric aspirates from neonates aged <24 hours.
- Examination of samples from purpuric skin lesions in children with suspected invasive meningococcal disease.
- Examination of eye swabs from children with severe ophthalmia neonatorum.
- Microscopy & culture of urine samples collected by invasive methods (e.g. suprapubic aspirate)
- Microscopy & culture of clean catch samples of urine in cases where the result will influence the patient’s immediate management. Samples from ED will only be examined if they fulfill the criteria given in the Guideline for the Management of Urinary Tract Infection policy available in the ED section of the P-drive.

Any other tests must first be approved by the On-call Consultant Microbiologist.

Please note that the on call technician does not remain on site and therefore cannot access any results, do not contact them for results, use the ICE system.
Sending a Specimen

Specimens collected at sites outside Birmingham Children’s Hospital should, where possible, be sent via the blood sciences/clinical chemistry department in the originating hospital. In some cases specimens for certain tests may require immediate transport by courier or taxi. Specific needs are listed in the specimen requirement section of the table in this handbook. If using a courier or taxi please request that the specimens are delivered to the Paediatric Laboratory Medicine Block entrance at Whittall Street (not to the main hospital post room). See section 6.
5 Specimen Collection, completion of the request form and management of urgent and additional requests

Consent

Unless written consent is required for a particular test or investigation (this will be documented in the test details), the laboratory assumes that informed consent for testing to be carried out has been given at the time of the request form has been completed.

It is the responsibility of the requesting doctor to obtain consent for specimen collection and the tests requested. It is implicit in the receipt of the request form that consent has been obtained. We never request more sample than we need to but where there is material left over after laboratory testing, it may be used for other purposes such as quality assurance or audit, under the provisions of the Human Tissue Act 2004. Specific research is regulated separately by the ethics committee. Consent for the use of tissue requires that patients must be given the option to refuse permission for spare material to be used. When this occurs, each request to the laboratory must be clearly marked so that specimens are not used for other purposes.

There may be specific requirements for written consent for DNA tests sent to other countries, please contact the molecular genetics laboratory for further information.

Specimen Collection (including the preparation of the patient)

It is the responsibility of clinical staff ordering tests, taking samples, or sending samples to the ward to:

- Be familiar with and comply with Policy for Labelling and Transporting Laboratory Specimen and associated procedures.
- Be aware of the hazards to themselves and others that would exist through noncompliance with the Policy for Labelling and Transporting Laboratory Specimens policy
- When requesting specimens for analysis that may present a high risk of infection, ensure that staff who may take or handle the specimen are warned of the risk so that appropriate additional precautions can be taken

The notes on the following pages give details of the collection of various types of specimen and the investigations which are routinely performed by the laboratory on each sample. If in doubt as to the most appropriate investigation, please contact the Consultant Microbiologist.

Containers for Specimen Collection

These can only by supplied by laboratory staff during the routine working hours.

Items supplied to all wards and departments, please phone BCH ext. 9803 or come and collect directly from the laboratory:

- Blood Culture Bottles
- Sterile Universal Containers
- Faeces Pots (Blue top)
- Transwabs (for routine microscopy and culture)
- Chlamydia transport medium (limited supply in most wards & departments: please contact the laboratory if no swabs available locally)
Items supplied as required (telephone laboratory):
- Glass slides for vesicle scrapings

Specimen Collection for Bacteriology, Mycology and Parasitology
- Please see Appendix 2 for a list of the tests performed within Microbiology at BCH, the container required and other sample requirements. However additional details can be found below.
- Please see Appendix 1 for samples that can be processed at referral laboratories. Tests such as these have to be agreed to by a Consultant Microbiologist due to the high cost. A consultant will look through all requests after arrival in the laboratory, please write all important information on the request form as this will aid in the decision.

Instructions for patient collected samples
Please contact the laboratory or speak to the Doctor or nurse who has asked for the test.

Sample Collection
Blood cultures
A continuous monitoring automated blood culture system is used in the department of Microbiology. The system detects the presence of aerobic and anaerobic bacteria, and fungi by measurement of CO2 generated in a specially formulated culture medium.
Blood culture sets consist of 3 types of bottles - a paediatric bottle (yellow cap) for Neonates and Children and an aerobic (blue) and an anaerobic bottle (purple cap) for adults supplied by the Department of Microbiology.

Blood cultures are incubated for 5 days (extended incubation is performed where endocarditis is suspected) all positives are notified to ward clinicians as soon as possible.
Volumes Up to 4ml of blood should be placed in the paediatric bottle and up to 10 ml in the aerobic an anaerobic bottles.
Number of Sets: In acute bacterial sepsis – at least one set of cultures should be taken prior to starting antibiotic therapy.
In the investigation of Endocarditis three sets should be taken before starting antibiotics.
In patients with central venous and arterial lines, cultures should be taken from each lumen of each line and from a peripheral site if possible.
Labelling: Bottles must be clearly labelled and the date, time and site of blood sampling must also be indicated. Request forms must also be clearly labelled. The unit and consultant must be provided. Appropriate clinical details should be provided and site of sampling also stated.
Unlabelled samples will usually not be accepted. The nurse in charge of the unit or medical personnel involved will be notified, a repeat sample requested and the bottles discarded. Documentation of the incident is recorded.

Faeces
There are 2 main reasons for sending faecal samples to microbiology:
- to screen for the presence of antibiotic resistant bacteria,
- for investigation of gastrointestinal disease (in most cases diarrhoea).
It is vital that if faeces are sent for investigation of disease that this is stated and that relevant clinical details are given (especially following foreign travel).
Otherwise (unless the specimen is liquid) the sample may be processed as a screening specimen only.

**Respiratory samples**

*Nose and Throat swabs*: Please give clinical details as they are part of the routine admission screen and may not get processed for pharyngeal pathogens unless the patient’s clinical condition is indicated.

*Mouth swabs* and *Tongue swabs*: Mainly for investigation of upper airway specimens and *Candida* sp.

**Sputum samples**: For investigation of lower respiratory infections. Where NPAs are sent for both Bacteriology and Virology please indicate this or send two specimens.

Per nasal swabs should be sent for cases of suspected *B. pertussis*. This sample may also be sent for Bordetella pertussis PCR if an NPA is not received. These swabs should be sent as soon as possible and not be put into a swab container.

Where Mycobacterial investigation is required collect samples on 3 consecutive days into a sterile container.

**Urine samples**: Because of the high frequency of immunosuppression, empirical antimicrobial therapy and the difficulty of collecting specimens from children, urine samples are followed up in more detail than in many other laboratories. Please repeat specimens when clinically indicated and remember that the provision of sensitivity data does not always imply that treatment is necessary.

**Skin swabs**: Please remember to indicate if these are for the investigation of infection or for screening for MRSA. Also indicate when these are from burns patients or from cases of impetigo as they may be processed differently.

**Soft tissue infections and abscesses**

For microbiological investigations of such infections tissue or pus are preferred to swabs. If TB is a possible diagnosis this should be stated as it requires special culture techniques.
Instructions for the completion of the request form

The laboratories have well established acceptance criteria which need to be present for samples to be accepted and processed. All essential items need to be present on the form to ensure that patients are uniquely identified so that results are not allocated to the wrong patient, and that the correct test can be performed and reported to the correct clinician and sent to the correct location.

It is the responsibility of the requesting clinician to complete the correct request form fully. Errors or incomplete information WILL result in the delay in specimen processing and reporting.

- Please use ICE requesting whenever possible
- If not using ICE requesting, please use patient address stickers wherever possible (Note that patient information stickers may relate to a previous admission, and may be incorrect, please check before use)
- Request forms must be completed in full and legibly. Please take particular care to ensure that the Consultant and Specialty are given (this information is essential for activity data purposes), and that the correct ward is given. Please ensure appropriate contact details including bleep number and name of requesting clinician are given in case there is a problem.
- Information about the specimen together with the date and time (please use the 24 hour clock) is important for both correct specimen identification and interpretation. The type of specimen, site of infection, relevant clinical details and duration of symptoms (for microbiology the date of onset of symptoms or date of contact are often vital in selecting and interpreting serological tests), details of antibiotic therapy.

We will cooperate with users in clarifying the request where necessary.

To comply with laboratory procedures, we will only accept samples where all mandatory information and minimum patient identifiers are provided. The following essential information is required:

<table>
<thead>
<tr>
<th>Essential Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>NHS Number / Hospital Registration Number</td>
</tr>
<tr>
<td>Surname</td>
</tr>
<tr>
<td>Forename</td>
</tr>
<tr>
<td>Date of Birth</td>
</tr>
<tr>
<td>Identification and location of requestor</td>
</tr>
<tr>
<td>Investigation required</td>
</tr>
<tr>
<td>Date and time of collection</td>
</tr>
<tr>
<td>Specimen Type, where appropriate the anatomical site of origin</td>
</tr>
<tr>
<td>Relevant clinical information</td>
</tr>
<tr>
<td>Fasting or dietary status</td>
</tr>
<tr>
<td>The date of the onset of symptoms or date of contact</td>
</tr>
<tr>
<td>Details of antibiotic therapy and drug therapy</td>
</tr>
<tr>
<td>Biohazard warning label</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Desirable Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient address</td>
</tr>
<tr>
<td>Recent transfusion history (where relevant)</td>
</tr>
<tr>
<td>Any anticoagulant agents administered</td>
</tr>
<tr>
<td>Contact phone number / bleep</td>
</tr>
<tr>
<td>Indication of the urgency of the request</td>
</tr>
<tr>
<td>Gender</td>
</tr>
<tr>
<td>Medical Specialty</td>
</tr>
<tr>
<td>NHS/PP category</td>
</tr>
</tbody>
</table>
Electronic Requesting (ICE)
If you are sending ICE requests to Microbiology, please ensure that you have attached the ICE request sticker to the laboratory request form.

Specimen labelling and minimum data set
The specimen must be labelled with the following information:
1. Surname
2. And two from
   - Forename
   - Date of Birth
   - Registration number
   - Referring laboratory specimen number

Urgent Specimens during daytime opening hours
Please phone the laboratory on 9802 to inform them that an urgent sample is on its way. Please have the following details available: Patient name, Hospital Number, Specimen type, Ward location/bleep number. If possible, please hand deliver the specimen to Microbiology to ensure the sample arrives within the department as soon as possible. The result will be available on ICE, or will be phoned through to the ward or bleep number given over the phone or on the request form.

Tobramycin assays are currently referred for testing elsewhere. If you are sending a specimen for a Tobramycin level, please inform the laboratory on 9802 as soon as possible.

High Risk Specimens
All staff are required by the Health and Safety at Work Act to take reasonable care for their own safety and that of other people who may be affected by their actions. Laboratory work is hazardous and extra precautions are necessary for certain specimens.

All specimens are potentially an infection risk and must be handled carefully. However, additional precautions are necessary for certain specimens from patients known, or suspected to have infections that may be transmitted to laboratory and other health care workers.

Appropriate Biohazard (Danger of Infection) labels must be attached to request forms and specimen containers. Lids of specimen containers must be securely tightened and the containers securely sealed within the specimen pouch attached to the request form.

Samples requiring labelling and handling as Biohazard – (Danger of Infection)(Capillary blood must NOT be taken)

All specimens from patients suspected or proven to have the following infections:
- Acute Hepatitis of viral aetiology
- Hepatitis B or C (acute or chronic)
- Patients with liver disease in whom Hepatitis has not been excluded
- Acquired Immunodeficiency Deficiency Syndrome (AIDS) or HIV positive
- All patients who have fever and have recently returned from an area where viral hemorrhagic fevers are endemic
- Sputum and other material that may contain tubercle bacilli from patients with suspected or proven tuberculosis.
- CSF, brain tissue and spinal cord material from patients at risk of or suspected of having a proven transmissible spongiform encephalopathy (CJD, vCJD etc.).
- Upper respiratory tract specimens, blood cultures, CSF and samples from skin lesions from patients with suspected or proven meningococcal infection (until 24h after commencing antibiotic therapy).
- Stools from patients with suspected typhoid, paratyphoid or dysentery (e.g. recently returned from an endemic region such as the Indian sub-continent).
- Blood and urine cultures from patients with suspected typhoid or paratyphoid, or recently returned from an endemic region such as the Indian sub-continent.
- Stool specimens from patients with suspected E. coli 0157 infection (haemolytic-uraemic syndrome (HUS)).
- Other specimens such as those from patients with suspected SARS as directed by the Infection Control Team.

Specimens should NOT be collected from patients in whom a diagnosis of viral haemorrhagic fever is strongly suspected before consulting a Medical Microbiologist.

If you suspect a patient may be Hepatitis B surface antigen positive, Hepatitis C, or HIV positive UNTIL PROVEN OTHERWISE they must be treated as "HIGH RISK".

Phlebotomy in high risk patients
For some patients collection of capillary specimens is inadvisable due to the risk of exposure to blood-borne pathogens. Venepuncture, if at all possible, is required in such circumstances. Capillary samples are not recommended in the following situations:
- HIV, acute hepatitis of suspected viral aetiology, hepatitis B carriers or patients who have positive hepatitis C serology.
- Leptospirosis during the first 8 days of the illness.
- Syphilis (Congenital) until the patient has received 7 days of antibiotic therapy.
- Suspected Viral Haemorrhagic Fever (Contact a Medical Microbiologist before collecting any samples from these patients).

Add-on Tests / Verbal requests
If you require a test to be added to a sample that has previously been sent, please phone the laboratory. Each sample will be assessed individually to determine whether the further testing is possible, i.e. whether there is enough sample, is sample integrity maintained etc. If it is possible, you will need to send a further request form stating that the sample is already within the laboratory. You may possibly be given a laboratory reference number to quote. Please bear in mind, samples are only kept for a certain amount of time and information on storage times can be given by calling the laboratory.

Criteria for acceptance and rejection of samples
Request forms and specimens are the key source of data for any department. The details on the request form, form the information that is entered onto the Laboratory computer system, Telepath which enables results to be available on the Laboratory reporting system ICE. If any detail is missing on either the request form or sample, there is a risk that the specimen may be rejected. The criteria is clearly stated in ‘Instructions for completion of the request form’ and ‘Sample labelling and minimum data set’
Specimen rejection

Mislabeled request form/specimens: The requesting doctor will be informed where possible, they will then have to come to the laboratory and manually amend the details. If this fails to happen, the sample will be kept and a report will be issued stating that the sample has not been processed with an explanation as to why this has occurred.

Unlabelled request form/ specimens: as above.

The following samples will not be rejected due to the nature of their importance: CSFs, SUDS cases, unrepeatable theatre samples.

Leaking samples may be rejected upon receipt: each sample will be assessed individually as to its infection control risk and its reproducibility. Please ensure lids are screwed tightly onto the containers.

Occasionally the laboratory has to reject specimens for testing for the following reasons.

- The minimum data set outlined above is not met
- The request made is inappropriate.
- The names on the specimen and the request form do not match.
- Insufficient information is provided on the request form to determine the test required.
- The specimen submitted is unsuitable for the investigation required.
- The specimen fails to comply with safety protocols.
- Damage to the specimen container at some stage has resulted in leakage or total loss of the specimen.
- The quality of the specimen is inadequate, e.g. age of the specimen, haemolysis of blood specimen, insufficient specimen etc.
6 Transportation of samples to the laboratory

All specimens must be handled with care and treated by all personnel as a potential infection risk. However, additional precautions are required for samples that are deemed to be high risk.

Low Risk Diagnostic Specimens (UN3373):
The majority of specimens collected and transported to the pathology departments do not present a significant risk of infection to staff handling them. These may be considered “low risk” diagnostic specimens. Such specimens will normally be packaged in a primary container (e.g. blood tube, swab tube, specimen pot), and an outer secondary container (a sealed pathology transport bag or sealed plastic bag). All specimens must be accompanied by an accurately, fully completed pathology request form which must preferably be integral and external to the bag. The tertiary container used to transport specimens around and between hospitals may vary in design, but must comply with the P60 specification outlined in this Policy.

High Risk Infectious Specimens (UN2114):
Some patients may be suffering from, or be suspected of having a disease which may present higher risk to staff. Legislation requires specimens from such patients to be identifiable.

- The specimen containers and pathology transport bags used for these specimens will be identical to those used for routine specimens. The identification of risk associated with these specimens will be by the use of “DANGER OF INFECTION” labels. The specification for these labels is given in Appendix C.
- It is the legal responsibility of the person who requests the laboratory examination of the specimen to ensure that both the request form and the container are correctly labelled to indicate a danger of infection. “DANGER OF INFECTION” labels must only be used for specimens which are suspected of or are known to contain pathogens.

BCH Internal Transport

The laboratories operate a joint specimen collection service. Specimens are collected via a ward round that visits all BCH wards commencing at 09:30 and 14:30 Monday to Friday, and a shorter ward round that visits ED and ITU only at approximately 10:30 and 15:30 Saturday, Sunday and Bank holidays.

Monday - Friday: Non urgent specimens should be left at the designated collection point on the Ward/Department.

Saturdays, Sundays and Bank holidays; routine samples will be collected from ED, ITU and Waterfall House only.

Specimens may be delivered to the BCH laboratories in person (there is a common Reception Area on the ground floor of the laboratory block), or via the air tube transport system. The air tube system is managed by Estates; report any problems via the estates hotline.

There are no staff members within the microbiology department out-of-hours. During this time, the pod station to Microbiology will be switched off to prevent sample degradation. They can be podded to Clinical Chemistry (station 200) who will place the samples directly in the fridge to wait until 9:00 when Microbiology opens. For urgent samples, please see the relevant section within the Microbiology Intranet pages.
Out of hours blood cultures should be placed in the allocated box within the satellite laboratory in the PICU or Emergency Department. Other microbiology samples should be refrigerated either in the small laboratory refrigerator in ICU, or retained in ward/departmental refrigerators.

Do not send high risk specimens in the air tube system as decontamination in the event of a spillage is extremely difficult. Please do not send blood culture specimens through the air tube system.

**Air Tube**

All sample containers must be properly closed and packaged in a dedicated sealed specimen bag with absorbent padding attached to the request form. Excessive numbers of samples should not be packed into a pod as this may cause the lid to open during transportation.

The pod system is in operation during the opening hours of the laboratory.

The Microbiology pod number is 400.

It is the responsibility of the sender to ensure that:

a. The sample is labeled, packed appropriately and is accompanied by the relevant paperwork.

b. The air tube sample carrier is secured properly before transport.

c. The air tube sample carrier is sent to the correct ‘system’ address

The sample(s) should be secured in the air tube carrier pod and the lid is closed;

**Transport of Specimens to the Laboratory: Birmingham Women’s Hospital Locations**

Samples should be sent to BWH Pathology Specimen Reception. From here, they will be packaged and sent via courier to the Microbiology department at Birmingham Children’s Hospital. There are set times throughout the day with which the couriers will be collecting the samples:

Monday to Friday Collection time:
03:00, 06:30, 10:00, 11:00, 13:00, 14:00, 15:00, 16:00, 17:30, 20:00, 23:59

Saturday, Sunday, Bank Holiday Collection time:
03:00, 06:30, 09:00, 11:00, 13:00, 15:30, 17:30, 20:00, 23:59

**Instructions for sending samples from an external source**

Specimens collected outside the hospital should be delivered using the correct packaging that complies with national guidelines and sent via hospital transport, courier or taxi. The department should be notified in advance of any urgent or special requests.
7  **Examinations offered by the laboratory**
This section of the handbook explains which examinations are offered by the laboratory, including (as appropriate) information concerning samples required, sample volumes, special precautions, biological reference intervals and clinical decision values.

**Antibiotic assays**
Testing is only performed during core hours.
Specimens from BWH should reach BW pathology department before 14:00hrs Monday to Friday or 10:00hrs Saturday/Sunday. Please advise the laboratory by telephone if you expect the specimen to arrive later and require a result that day. Please ensure that specimens are sent to BCH before 10.00 h.

The need for pre- and post-dose samples will depend on the antibiotic regimen being used
- **Pre-dose** samples should be collected within 15 minutes prior to the next dose.
- **Post-dose** samples should normally be taken 30-60 min after administration of the dose.

**Blood cultures**
Blood cultures are normally incubated for a total of 5 days. Over 95% of significant isolates are detected within the first two days of incubation. On this basis a report is issued on cultures that remain negative after 2 days incubation stating “No organisms isolated after 48 hours incubation”.
Blood cultures must not be refrigerated prior to transportation to the laboratory.

**Urogenital tract swabs**
Some urogenital pathogens, e.g. Neisseria gonorrhoea, rapidly lose viability on swabs therefore these specimens must be transported to the laboratory as soon as possible. Note that special swabs are required for chlamydia diagnosis.

Endocervical swabs are essential for reliable detection of Neisseria gonorrhoea. Other pathogenic microorganisms, e.g. candida, trichomonas, are most reliably detected from vaginal swabs.

Satisfactory endocervical swabs can only be obtained using a speculum. Clean the cervicalosa with sterile gauze or a separate swab before sampling. Insert the swab a few mm into the endocervical canal and rotate it several times. Withdraw the swab without touching the vaginal wall.

A high vaginal swab is obtained from the posterior fornix and upper lateral vaginal walls after visualisation using a speculum. In most instances a low vaginal swab (collected without a speculum) is adequate for microbiological investigations.

**Urine**
It is essential that the method of collection of the sample is stated on the request form to facilitate interpretation of the results.

**Midstream urine (MSU)**
Antibacterial substances should not be used to clean the urethral orifice (soap and water are satisfactory) contamination from the vagina should be prevented. The patient should be instructed to partially empty the bladder (to wash out organisms from the anterior urethra). A sterile container is then passed into the stream of urine. A
sterile foil gallipot into the stream is often the most practical method; then transfer sample to sterile universal.

**Clean catch urine**

In neonates/infants, reflex micturition is sometimes provoked by sudden cold exposure. Have a sterile universal container, uncapped, to hand when the baby is undressed. If the bladder is full, reflex voiding may also be provoked by holding the baby in ventral suspension and lightly stroking along the back, parallel to the lumbar spine.

**Bag urine**

It is preferable to use sterile bags which have a one way valve that prevents voided urine gaining contact with the baby’s external genitalia, e.g. hollister bags. After voiding, draw urine from the bag by tearing the seal off the port.

Before applying a urine bag, clean the genitalia to remove faecal contamination by washing with soap and water. The skin should be dried and the urine bag attached securely over the external genitalia, ensuring that in girls the perianal region is excluded.

**Suprapubic bladder puncture**

A suprapubic aspirate (SPA) is valuable in clarifying the significance of equivocal results. It is essential that the baby is held appropriately to prevent movement. An uncapped, sterile universal container should be available in case the baby voids urine prior to bladder puncture.

Disinfect the midline suprapubic skin with alcohol and allow to dry. Using a 21g needle and 10 mL syringe, pierce the skin perpendicularly in the midline approximately 1 cm above the symphysis pubis. Once the bevel of the needle is within subcutaneous tissues draw back on the plunger, to create a slight negative pressure. Maintaining negative pressure, advance the needle until urine wells up into the syringe. Collect 1 or 2 mL of urine; withdraw the syringe and needle and transfer urine to a sterile universal container.

**Urine for culture for mycobacteria**

Examination for mycobacteria is only undertaken on request. Collect three complete early morning urine samples. Each sample should be sent to the laboratory immediately after collection.

**Urine for culture for mycoplasmas**

Examination for mycoplasma is only undertaken when requested by a Uro-gynaecologist.

**Amniotic fluid**

Amniotic fluid can be tested for the microorganisms included in TORCH screening, normally testing will only be undertaken after maternal serology results are available, and point to the possibility of an intrauterine infection. Send amniotic fluid to the laboratory in a sterile universal container.

CMV requests are referred to the Midlands public health laboratory at Heartlands Hospital Toxoplasma to national reference laboratory at Swansea Parvovirus to PHE Colindale, London

**Specimens for viral serology**

Please be specific with your request and do not request ‘viral screen’.

**Torch Screening**

The basic TORCH screen involves testing for infection with cytomegalovirus (CMV), rubella virus and *Toxoplasma Gondii*. Please
note that there is no evidence that infection with human parvovirus B19 is associated with congenital abnormalities, but can lead to anaemia and non-immune hydrops. Tests for other micro-organisms are available on specific request. TORCH screening may be performed on maternal blood samples collected at antenatal or postpartum, or on neonatal samples.

These notes are intended only as a guide to the initial investigation of suspected congenital infection. We are always pleased to advise further on this matter.

**Investigations for maternal infection**

Detection of specific IgM antibodies is often helpful in demonstrating recent maternal infection. However the period of IgM sero-positivity varies for different infections. In infections such as toxoplasmosis, where there is a long period of IgM sero-positivity, IgM detected during pregnancy may relate to an acute infection that occurred prior to pregnancy. Conversely, other infections are associated with a much shorter window of IgM sero-positivity, which may be missed if a single serum collected months after the acute illness is tested. Testing stored antenatal booking sera in parallel with later samples can provide definitive evidence of infection during pregnancy if seroconversion is demonstrated.

Different maternal infections cause different foetal abnormalities, and we discourage blanket requesting of TORCH screens. Instead, we recommend requesting specific tests based on the clinical presentation of the individual case.

The following protocol has been agreed in conjunction with the Foetal Medicine Department:

<table>
<thead>
<tr>
<th>Fetal Abnormality</th>
<th>Tests on maternal blood</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fetal hydrops</td>
<td>Parvovirus IgM CMV IgG + IgM</td>
<td>Syphilis: Request Syphilis serology if not done on booking blood</td>
</tr>
<tr>
<td>Echogenic bowel</td>
<td>CMV IgG + IgM</td>
<td></td>
</tr>
<tr>
<td>Ventriculomegaly</td>
<td>CMV IgG + IgM Toxoplasma IgM</td>
<td></td>
</tr>
<tr>
<td>Polyhydramnios (increased liquor volume)</td>
<td>Parvovirus IgM</td>
<td>Consider further tests only if any other abnormalities found on scan</td>
</tr>
<tr>
<td>Fetal death/stillbirth/miscarriage</td>
<td>Parvovirus IgM CMV IgG + IgM Toxoplasma IgM</td>
<td>Rubella: check booking blood results. If non-immune or booking blood not found: request rubella IgG+IgM Syphilis: Request Syphilis serology if not done on booking blood</td>
</tr>
</tbody>
</table>

**Investigations for babies with suspected congenital infection**

The value of IgM testing of neonatal blood as a marker of congenital infection depends on the infecting agent. In cases of suspected congenital CMV infection, a urine sample collected within the first three weeks of life should be sent for PCR.

Where it is necessary to investigate an older infant for possible congenital CMV infection PCR can be performed on surplus neonatal blood spot samples. These are stored by the Clinical Biochemistry
Investigation of Infants born to HIV positive Mothers or Mothers Treated for Syphilis during Pregnancy

Please refer to the relevant Neonatal Directorate policies.

Investigation, Prevention and Management of Chickenpox during Pregnancy and the Neonatal Period

Chickenpox is the most common potentially serious infectious disease to which pregnant women are exposed.

Contacts of Chickenpox or Shingles

Immunoprophylaxis of non-immune contacts with varicella zoster immunoglobulin (VZIG) or aciclovir prophylaxis is effective in preventing or modifying chickenpox (see up to date trust guideline on management of post-exposure prophylaxis for chickenpox and shingles).

Pregnant women who have a definite history of previous chickenpox or shingles can be reassured that they are immune and require no treatment in the event of contact. Those without such a history should be tested for anti-varicella antibodies.

Neonates who are contacts of chickenpox or shingles may need to be tested for anti-varicella antibodies unless their mothers have a clear history of having had chickenpox or shingles. Because pre-term infants born at less than 32 weeks gestation may not have acquired passive antibody from their mothers, they should always be tested for anti-varicella antibodies.

Due to national shortage of VZIG there are restrictions in place for its use. At present, non-immune pregnant women <20 gestation and neonates are offered VZIG, while all other non-immune high-risk individuals are offered oral aciclovir prophylaxis. Always check the latest PHE guidance and local policy.

VZIG is only available from PHE Colindale. A VZIG Clinical Record Form needs to be completed (available at: https://www.gov.uk/government/publications/varicella-zoster-immunoglobulin). Email the completed form to PHE.RIGS@nhs.net by secure email. Notify the RlgS team (0208 327 6204) once the form has been emailed to discuss the form and clarify the delivery arrangements.

If VZIG is ordered on Mondays to Friday before 12 noon the VZIG will be issued the next working day through Movianto, UK.

Staff who have contact with chickenpox or shingles and who do not know that they are immune should report to their line manager, who will ensure that either the Infection Control Team or Occupational Health are informed.

Pregnant Women or Neonates with Chickenpox

If a clinical diagnosis cannot be made with confidence, investigation by PCR may be indicated: please contact to Medical Microbiologist to discuss any such requests. Serological testing is not helpful in diagnosing chickenpox or shingles.
Antiviral agents such as acyclovir are not licensed for use during pregnancy, although there are no data to suggest that they are teratogenic for humans. Specific antiviral therapy should be considered in any pregnant women with chickenpox, and should certainly be prescribed if there is evidence of pulmonary disease. Antiviral therapy is required for neonatal varicella infections. Note that there is no evidence that VZIG is effective in treating established chickenpox.

**Infectious Diseases in Pregnancy Screening Programme**

The Microbiology laboratory provides the Infectious Disease in Pregnancy screening (IDPS) programme at Birmingham Women’s and Children’s NHS Foundation Trust.

The UK National Screening Committee (UK NSC) policy for the IDPS programme is to offer and recommend screening to all eligible women. This is to enable early detection and treatment for infections in pregnancy in order to significantly reduce the risk of mother to child transmission of infection.

The IDPS programme currently screens for:

- HIV
- Hepatitis B
- Syphilis

For further information about these tests and the IDPS screening programme, please refer to the Microbiology IDPS User Handbook located on the BWC Pathology internet pages (MICGEN/F/077).

**Other Infectious Diseases in Pregnancy**

Contact with other potentially serious infectious diseases in pregnancy (e.g. rubella, parvovirus) is much less common. The investigation and management of each case needs to be considered individually in consultation with the Microbiology Department.

**Zika virus:** A testing algorithm for patients at risk of Zika virus infection, which is regularly updated, is available on the RCOG website.
Influenza A PCR

Influenza PCR can only be requested if authorized by a Clinical Medical Microbiologist.

Enquiries, 9:00-5:00 ext. 9810, out of hours contact via switchboard

**Nasal swabs** require a special swab (with transport medium) for Influenza PCR which is obtainable from Microbiology only when the request has been authorized by a Clinical Medical Microbiologist.

Influenza PCR can also be performed on **nasopharyngeal aspirates (NPA)** and **broncho-alveolar lavage (BAL)** specimens. These do not require transport medium, but must still be approved by a Clinical Medical Microbiologist.

**Covid-19 Coronavirus advice and guidance**

For up to date information regarding Covid-19 advice and guidance, please refer to the following pages:

For Staff:

For patients and visitors:

**Request for T-Spot, Quantiferon or Mantoux Testing**

Please contact Consultant Microbiologist for advice

**Health and Safety**

**Basic health and safety regarding specimens**

- Ensure that all specimens and request forms are packaged correctly
- All specimen lids fit securely
- Specimen pots and request forms are clean externally (i.e., no blood stains)
9 Reports, turnaround times and availability of clinical advice

Microbiology Reports

Electronic Reports and Paper Reports (Both BCH and BWH sites)

Microbiology Laboratory reports are distributed to wards and other departments electronically via the ICE reporting system. Although there is a progression towards going paperless, some areas still require hard copies (outpatients); these are produced and sent later. All new ICE users should be trained. Contact Mr. Russell Denmeade on extension 9941 to arrange training.

Reports of referred tests are reported by the BCH Microbiology department in the usual manner. These reports will include:

- identification of the referral laboratory
- all the results from that laboratory
- appropriate interpretive comments of the referral laboratory

Reports may be telephoned if the requester has indicated that it is required or if the results obtained are sufficiently abnormal to require immediate review by medical staff.

Guidelines for the Laboratory Computer System

1. All Ward computer terminals having access to “Internet Explorer” should allow passage to laboratory results.
2. Parents, relatives, patients and unauthorised members of staff must not under any circumstances have access to laboratory results on the computer.
3. Laboratory results will be available on the computer as soon as they have been authorised. If for any reason you have concerns about the validity of the results, please contact the laboratory straight away.
4. The laboratory computer system will always show the latest results released by the laboratory. Therefore, always check the date of the report shown on the computer.
5. Authorised access to the laboratory computer system is controlled by entering a username and password. Currently these may be based on locations. However, individual passwords are being introduced and it will become a disciplinary offence to reveal your password to anyone else. Passwords will be changed every 3 months and an audit of password usage carried out.
6. It is important to accurately record and convey results taken from the computer.
7. Because of the abbreviations that have to be used at the moment, some of the complex tests will need to be interpreted only after consultation with the laboratory, or after receipt of the typed report. The laboratories cannot accept responsibility for misinterpretation of results reported on the computer. If in doubt please seek advice. Some laboratory results, which require expert interpretation, will not be available on the computer.

Results by Telephone

Preliminary results for urgent requests will be telephoned directly to the requesting source or clinician as soon as they are available. Please do not telephone the laboratory for the results as doing so is only likely to delay the analysis. The laboratory routinely telephones any unusual or important results, including all positive blood cultures. In order to help us run the laboratory efficiently we would be grateful for your help in limiting the number of telephoned requests for non-urgent &/or historical results. Please note the following rules relating to telephoned results:
All telephone results should be recorded in the specified ‘LAB RESULTS FORM/BOOK’ by a qualified nurse or clinician.

- All telephoned results should be repeated back to the laboratory staff for verification.
- If in doubt about a recorded result, telephone the laboratory immediately for confirmation.
- Results will not be given to patients.
- Results of positive antenatal screening tests will not be available to anyone other than Antenatal screening midwives until the laboratory is sure that the woman is aware of her diagnosis.
**Turnaround Times**

Turnaround times quoted are the anticipated times between specimen receipt in our laboratory and reporting under normal operating conditions. The turnaround times of all tests are monitored.

<table>
<thead>
<tr>
<th>Sample investigation</th>
<th>Turnaround Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper respiratory tract cultures</td>
<td>90% within three days</td>
</tr>
<tr>
<td>BAL microscopy</td>
<td>95% within one day</td>
</tr>
<tr>
<td>CSF microscopy</td>
<td>100% within one day</td>
</tr>
<tr>
<td>Urine microscopy</td>
<td>95% within one day</td>
</tr>
<tr>
<td>Antibiotic Assays</td>
<td>90% within one day</td>
</tr>
<tr>
<td>CMV IgM</td>
<td>95% within four days</td>
</tr>
<tr>
<td>VZ IgG</td>
<td>95% within four days</td>
</tr>
<tr>
<td>Parvo IgM</td>
<td>95% within four days</td>
</tr>
<tr>
<td>HepB surface antigen</td>
<td>95% within four days</td>
</tr>
<tr>
<td>Hep C antibody</td>
<td>95% within four days</td>
</tr>
<tr>
<td>HIV antibody</td>
<td>95% within four days</td>
</tr>
<tr>
<td>Syphilis antibody</td>
<td>95% within four days</td>
</tr>
<tr>
<td>Chlamydia/GC</td>
<td>80% within four days</td>
</tr>
<tr>
<td>CMV pcr</td>
<td>95% within four days</td>
</tr>
<tr>
<td>EBV pcr</td>
<td>95% within four days</td>
</tr>
<tr>
<td>Adeno pcr</td>
<td>95% within four days</td>
</tr>
<tr>
<td>Mycology microscopy</td>
<td>80% in two days</td>
</tr>
<tr>
<td>Cryptosporidia microscopy</td>
<td>100% within three days</td>
</tr>
<tr>
<td>Urine culture</td>
<td>95% within three days</td>
</tr>
<tr>
<td>Faeces culture</td>
<td>95% within four days</td>
</tr>
<tr>
<td>SNE</td>
<td>90% within one day</td>
</tr>
<tr>
<td>BAL culture</td>
<td>95% within eight days</td>
</tr>
<tr>
<td>Heart Valve culture</td>
<td>100% within ten days</td>
</tr>
<tr>
<td>Blood cultures</td>
<td>90% within six days</td>
</tr>
<tr>
<td>MRSA culture</td>
<td>95% within three days</td>
</tr>
<tr>
<td>CSF culture</td>
<td>95% within 3 days</td>
</tr>
</tbody>
</table>

**LOWER RESPIRATORY CULTURES**

<table>
<thead>
<tr>
<th>Lower respiratory culture</th>
<th>No change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tip culture</td>
<td>90% within three days</td>
</tr>
<tr>
<td>Skin cultures</td>
<td>95% within three days</td>
</tr>
<tr>
<td>Wound cultures</td>
<td>95% within three days</td>
</tr>
<tr>
<td>Pus/tissue cultures</td>
<td>100% within eight days</td>
</tr>
<tr>
<td>Milk cultures</td>
<td>95% within three days</td>
</tr>
<tr>
<td>MRSA pcr</td>
<td>95% within one day</td>
</tr>
<tr>
<td>Genital cultures</td>
<td>95% within three days</td>
</tr>
<tr>
<td>Covid-19</td>
<td>100% in one day</td>
</tr>
</tbody>
</table>

**REFERRED WORK – see appendix 1**

<table>
<thead>
<tr>
<th>Referral</th>
<th>Turnaround Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tobramycin</td>
<td>100% in two days</td>
</tr>
<tr>
<td>Meningococcal PCR</td>
<td>80% within five days</td>
</tr>
<tr>
<td>Rejected sample reports</td>
<td>95% within 1 day, 100% within 5 days</td>
</tr>
</tbody>
</table>
Availability of clinical Advice and Interpretation

If you wish to discuss a patient, or need specific advice, Consultants/Advanced Laboratory Practitioners can be contacted directly on their extensions during the working day or via Switchboard.

The following advice is available:

- They can advise on choice of examination and use of the services. This includes sample type, clinical indications and limitations of examination procedures and frequency of requesting the examination.
- They can advise on individual clinical cases.
- They can give professional judgments on how to interpret the results.
- They can help promote the effective utilization of laboratory services.
- They can consult on scientific and logistic matters. This includes explaining why a sample may not meet the acceptance criteria.

Contact numbers:

- Dr Jim Gray: ext. 9815
- Dr Mitul Patel: ext. 9814
- Registrar (rotational): ext. 9813
- Mr. Phil Milner: ext. 9809
- Laboratory staff are also available for technical advice on ext. 9802 and 9803.

For urgent medical or Infection Control advice outside normal working hours, contact the on-call Medical Microbiologist via switchboard.
10 Work Referred Away
The department regularly refers specimens to other specialist centres in order to provide a comprehensive diagnostic service. Most UK laboratories to which samples are referred are UKAS accredited. The performance of referral laboratories is routinely monitored. Where work has been done in other centres, this is made clear on our laboratory report. A list of referral laboratories is given in appendix 1.
<table>
<thead>
<tr>
<th>Assay</th>
<th>Specimen</th>
<th>Turnaround time</th>
<th>Laboratory</th>
<th>Telephone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adenovirus PCR</td>
<td>1ml EDTA blood</td>
<td>5 days</td>
<td>Department of Virology, PHE West Midlands. DX 4780102 Birmingham B</td>
<td>0121 424 3256</td>
</tr>
<tr>
<td>Adenovirus (enteric) Detection</td>
<td>Stool specimen</td>
<td>Available upon request</td>
<td>Virus Reference Department, PHE Colindale. DX 6530006 COLINDALE NW</td>
<td>020 8327 6017 or 6266</td>
</tr>
<tr>
<td>Antimicrobial and Antiviral Levels</td>
<td>2ml clotted blood</td>
<td>3 Days</td>
<td>The Regional Antimicrobial Reference Laboratory, North Bristol NHS Trust DX 6121302 WESTBURY TRYM 90 BS</td>
<td>0117 323 5654/5689</td>
</tr>
<tr>
<td>Amphotericin &amp; other antifungal assays</td>
<td>2ml clotted blood</td>
<td>5 Days</td>
<td>Mycology Reference Laboratory, PHE South West DX 6120200 BRISTOL 90 BS</td>
<td>0117 324 5028</td>
</tr>
<tr>
<td>ASOT (Streptococcal)</td>
<td>2ml clotted blood</td>
<td>6 days</td>
<td>Department of Microbiology, PHE West Midlands DX 6780102 BIRMINGHAM B</td>
<td>0121 424 3256</td>
</tr>
<tr>
<td>Aspergillus serology</td>
<td>2ml clotted blood</td>
<td>5 days</td>
<td>Mycology Reference Laboratory, PHE South West DX 6120200 BRISTOL 90 BS</td>
<td>0117 324 5028</td>
</tr>
<tr>
<td>Astrovirus detection</td>
<td>stool sample</td>
<td>Available upon request</td>
<td>Virus Reference Department, PHE Colindale. DX 6530006 COLINDALE NW</td>
<td>020 8327 6017 or 6266</td>
</tr>
<tr>
<td>Brucella detection</td>
<td>2ml clotted blood</td>
<td>5-6 days</td>
<td>Liverpool Clinical Laboratories, Virology DX 6967103 LIVERPOOL 94L</td>
<td>0151 706 4404 (Office) or (4719 manager)</td>
</tr>
<tr>
<td>Borrelia Serology (Lyme disease)</td>
<td>2ml clotted blood</td>
<td>Available upon request</td>
<td>Special Pathogens Reference laboratory, Centre for Emergency, Preparedness &amp; Responses DX 6930400 SALISBURY 92 SP</td>
<td>01980 612348</td>
</tr>
<tr>
<td>Bordetella pertussis PCR</td>
<td>PNS (do not send in charcoal)</td>
<td>Available upon request</td>
<td>Department of Microbiology, PHE West Midlands DX 6780102 BIRMINGHAM B</td>
<td>0121 424 3111</td>
</tr>
<tr>
<td>Bordetella pertussis Serology</td>
<td>Serum</td>
<td></td>
<td>Bacteriology Reference, Department (RVPBRU), 61 Colindale Avenue, London NW9 5HT DX 6530002 Colindale NW</td>
<td>020 8327 7887</td>
</tr>
<tr>
<td>Campylobacter antibody</td>
<td>2ml clotted blood</td>
<td>14 days</td>
<td>Preston Microbiology Services, Lancashire Teaching Hospitals NHS Trust DX 6960100 PRESTON 90 PR</td>
<td>01772 522100</td>
</tr>
<tr>
<td>Chlamydia serology</td>
<td>2ml clotted blood</td>
<td>12 days</td>
<td>Dept. of Microbiology, PHE South West DX 6120200 BRISTOL 90 BS Tel: 0117 342 5551</td>
<td></td>
</tr>
<tr>
<td>Coxsackie Characterisation</td>
<td></td>
<td></td>
<td>See Enterovirus Characterisation</td>
<td></td>
</tr>
<tr>
<td>Test</td>
<td>Sample Type</td>
<td>Turnaround Time</td>
<td>Ministry Test Site</td>
<td>Phone Numbers</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>----------------------</td>
<td>-----------------</td>
<td>------------------------------------------------------------------------------------</td>
<td>--------------------------------------</td>
</tr>
<tr>
<td>Coxiella serology</td>
<td>2ml clotted blood</td>
<td>4-7 days</td>
<td>Special Pathogens Reference Laboratory, Centre for Emergency, Preparedness &amp; Responses&lt;br&gt;<strong>DX 6930400 SALISBURY 92 SP</strong></td>
<td>01980 612348</td>
</tr>
<tr>
<td>Chloramphenicol Levels</td>
<td>2ml clotted blood</td>
<td>3 days</td>
<td>The Regional Antimicrobial Reference Laboratory, North Bristol NHS Trust&lt;br&gt;<strong>DX 6121302 WESTBURY TRYM 90 BS</strong></td>
<td>0117 323 5654/5698</td>
</tr>
<tr>
<td>Clostridium difficile PCR ribotyping</td>
<td>Stool specimen</td>
<td>5 days</td>
<td>Department of Microbiology, PHE West Midlands&lt;br&gt;<strong>DX 6780102 BIRMINGHAM B</strong></td>
<td>0121 424 3256</td>
</tr>
<tr>
<td>CMV PCR</td>
<td>Urine (Blood done in house)</td>
<td>5 days</td>
<td>Department of Virology, PHE West Midlands.&lt;br&gt;<strong>DX 4780102 Birmingham B</strong></td>
<td>0121 424 3256</td>
</tr>
<tr>
<td>CPE Carbopenamase Producing Enterococci Confirmation</td>
<td>2ml clotted</td>
<td>3 days</td>
<td>Department of Microbiology, PHE West Midlands.&lt;br&gt;<strong>DX 6780102 BIRMINGHAM B</strong></td>
<td>0121 424 3256</td>
</tr>
<tr>
<td>Daptomycin Levels</td>
<td>2ml clotted blood</td>
<td>3 days</td>
<td>The Regional Antimicrobial Reference Laboratory, North Bristol NHS Trust&lt;br&gt;<strong>DX 6121302 WESTBURY TRYM 90 BS</strong></td>
<td>0117 323 5654/5689</td>
</tr>
<tr>
<td>Delta serology</td>
<td>2ml clotted blood</td>
<td>16 days</td>
<td>Virus Reference Department, PHE Colindale.&lt;br&gt;<strong>DX 6530006 COLINDALE NW</strong></td>
<td>020 8327 6017 or 6266</td>
</tr>
<tr>
<td>Enterovirus PCR if request includes Parechovirus send to Manchester-see Parechovirus section)</td>
<td>CSF</td>
<td>5 days</td>
<td>Department of Virology, PHE West Midlands.&lt;br&gt;<strong>DX 4780102 Birmingham B</strong></td>
<td>0121 424 3256</td>
</tr>
<tr>
<td>Enterovirus Characterisation</td>
<td>Skin swab from fresh vesicle in virus transport media</td>
<td>10 days neg 15 days pos</td>
<td>Enterovirus Reference unit, Virus Reference unit, PHE Colindale&lt;br&gt;<strong>DX 6530006 COLINDALE NW</strong></td>
<td>020 8327 6017/6266</td>
</tr>
<tr>
<td>E coli 0157 serology</td>
<td>2ml clotted blood</td>
<td>14 days</td>
<td>Laboratory of Gastrointestinal Pathogens, Specialist &amp; Reference Microbiology Division&lt;br&gt;<strong>DX 6530008 COLINDALE NW</strong></td>
<td>020 8327 6111 or 6173</td>
</tr>
<tr>
<td>Flucytosine Levels</td>
<td>2ml clotted blood</td>
<td>3 days</td>
<td>Mycology Reference Laboratory, PHE South West&lt;br&gt;<strong>DX 6120200 BRISTOL 90 BS</strong></td>
<td>0117 324 5028</td>
</tr>
<tr>
<td>Fungal PCR</td>
<td>2ml EDTA</td>
<td>7 days</td>
<td>Mycology Reference Laboratory, PHE South West&lt;br&gt;<strong>DX 6120200 BRISTOL 90 BS</strong></td>
<td>0117 324 5028</td>
</tr>
<tr>
<td>Haemorrhagic fevers (viral)</td>
<td>Special</td>
<td>Available</td>
<td>Rare and Imported Pathogens Laboratory (RIPL), Public Health&lt;br&gt;<strong>0844 778 8990</strong></td>
<td></td>
</tr>
</tbody>
</table>
## Category A Packaging

**Arrangements:**
Telephone RIPL first
4.5 Serum, 4.5 EDTA, Urine if possible

**Upon request**
England, Manor Farm Road, **Porton Down, Wiltshire SP4 0JG**  
**DX 6930400, SALISBURY 92 SP**

## Helicobacter pylori culture from gastric biopsies

**Gastric bx in Dents medium.**

**Bacteriology Reference, Department (RVPBRU), 61 Colindale Avenue, London NW9 5HT**  
**DX 6530002 Colindale NW**  

## Helicobacter pylori antigen detection

**Faeces Test has to be rec’d in ref lab within 48 hrs. of collection**  

**7 days**

**Department of Microbiology, PHE West Midlands**  
**DX 6780102 BIRMINGHAM B**  

## Hepatitis B confirmatory testing & markers

**2ml clotted blood**  

**10 days**

**Department of Virology, HPA West Midlands.**  
**DX 6780102 BIRMINGHAM B**  

## Hepatitis B PCR

**5ml EDTA**  

**10 days**

**Department of Virology, HPA West Midlands.**  
**DX 6780102 BIRMINGHAM B**  

## Hepatitis B Surface Antigen QUANTIFICATION

**2ml clotted blood**  

**4 days**

**Virus Reference Department, PHE Colindale.**  
**DX 6530006 COLINDALE NW**  

## Hepatitis C confirmatory, testing

**10 days**

**FOR HEP C ANTIBODY CONFIRMATION - SEND FOR HCV PCR**

## Hepatitis C PCR

**800ul serum**  

**10 days**

**Department of Virology, PHE West Midlands.**  
**DX 4780102 Birmingham B**  

## Hepatitis E

**2ml clotted blood (Serology) 1ml EDTA blood (PCR)**  

**10 days**

**Virus Reference Department, PHE Colindale.**  
**DX 6530006 COLINDALE NW**  

## HIV 1+2 confirmations

**2ml clotted blood**  

**10 days**

**Virus Reference Department, PHE Colindale.**  
**DX 6530006 COLINDALE NW**  

## HIV PCR

**5ml EDTA**  

**10 days**

**Department of Virology, HPA West Midlands.**  
**DX6780102 BIRMINGHAM B**  

## Herpes Simplex Virus PCR

**CSF min 100 µl**  

**5 days**

**Department of Virology, PHE West Midlands.**  
**DX 4780102 Birmingham B**
<table>
<thead>
<tr>
<th>Test</th>
<th>Type</th>
<th>Duration</th>
<th>Reference</th>
<th>Contact Information</th>
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<tr>
<td>Herpes Simplex Virus 6</td>
<td>QUANTITATIVE PCR</td>
<td>5 days</td>
<td>Department of Virology, PHE West Midlands. DX 4780102 Birmingham B</td>
<td>0121 424 3256</td>
</tr>
<tr>
<td>Human Herpes Virus 6/7</td>
<td>PCR</td>
<td>7 days</td>
<td>Clinical Virology Department, Manchester Royal Infirmary DX 6962400 MANCHESTER 90</td>
<td>020 8327 6017 or 6266</td>
</tr>
<tr>
<td>Human Herpes Virus 8</td>
<td>serology</td>
<td>17 days</td>
<td>Virus Reference Department, PHE Colindale. DX 6530006 COLINDALE NW</td>
<td>020 8327 6017 or 6266</td>
</tr>
<tr>
<td>Human Herpes Virus 8</td>
<td>PCR</td>
<td>17 days</td>
<td>Virus Reference Department, PHE Colindale. DX 6530006 COLINDALE NW</td>
<td>020 8327 6017 or 6266</td>
</tr>
<tr>
<td>Influenza PCR</td>
<td></td>
<td>5 days</td>
<td>Department of Virology, PHE West Midlands. DX 4780102 Birmingham B</td>
<td>0121 424 3256</td>
</tr>
<tr>
<td>Itraconazole Levels</td>
<td></td>
<td>5 days</td>
<td>Mycology Reference Laboratory, PHE South West DX 6120200 BRISTOL 90 BS</td>
<td>0117 324 5028</td>
</tr>
<tr>
<td>Identification of bacteria</td>
<td>including 16S PCR</td>
<td>9 days</td>
<td>Department of Microbiology, PHE West Midlands DX 6780102 BIRMINGHAM B</td>
<td>0121 424 3256</td>
</tr>
<tr>
<td>Japanese B Encephalitis</td>
<td></td>
<td>4-6 days</td>
<td>Special Pathogens Reference laboratory, Centre for Emergency, Preparedness &amp; Responses DX 6930400 SALISBURY 92 SP</td>
<td>01980 612348 (612100 on call)</td>
</tr>
<tr>
<td>Legionella serology</td>
<td></td>
<td></td>
<td>Respiratory and Systemic Infection Laboratory, HPA Colindale DX 6530011 COLINDALE NW</td>
<td>020 8327 7331</td>
</tr>
<tr>
<td>Leptospirosis serology</td>
<td></td>
<td>4-6 days</td>
<td>Rare and Imported Pathogens Laboratory (RIPL), Public Health England, Manor Farm Road, Porton Down, Wiltshire SP4 0JG DX 6930400, SALISBURY 92 SP</td>
<td>0844 778 8990</td>
</tr>
<tr>
<td>LGV</td>
<td></td>
<td>N/A</td>
<td>Sexually Transmitted Bacteria Ref Laboratory, Specialist &amp; Reference Microbiology Division DX 6530014 COLINDALE NW</td>
<td></td>
</tr>
<tr>
<td>Measles IgM</td>
<td></td>
<td>12 days</td>
<td>Virus Reference Department, PHE Colindale. DX 6530006 COLINDALE NW</td>
<td>020 8327 6017 or 6266</td>
</tr>
<tr>
<td>Measles IgM Salivary</td>
<td></td>
<td>TO BE SENT BY E.D. STAFF</td>
<td>This investigation is not referred by Microbiology, The collection kits are kept on E.D. and the responsibility for</td>
<td></td>
</tr>
</tbody>
</table>

**NAME** Microbiology  
**Version:** 5  
**Document ID:** MICGEN/F/071  
**Page 34 of 38**  
**Date of issue:** October 2019  
**Final Authoriser:** Phil Milner
### Infection is being notified

<table>
<thead>
<tr>
<th>Test Description</th>
<th>Collection Kit in ED</th>
<th>Referring Them is theirs.</th>
<th>NOT SENT BY LAB</th>
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<tbody>
<tr>
<td>MERS</td>
<td>Respiratory Specimen</td>
<td>5 days</td>
<td>Virus Reference Department, PHE Colindale. DX 6530006 COLINDALE NW</td>
</tr>
<tr>
<td>Mumps IgM and IgG</td>
<td>2ml clotted blood</td>
<td>12 days</td>
<td>Virus Reference Department, PHE Colindale. DX 6530006 COLINDALE NW</td>
</tr>
<tr>
<td>Mycobacteria culture / PCR</td>
<td>5ml EDTA blood</td>
<td>4 days</td>
<td>Department of Microbiology, PHE West Midlands DX 6780102 BIRMINGHAM B</td>
</tr>
<tr>
<td>Mycology (Diagnostic testing)</td>
<td>Various Specimens</td>
<td>7 days</td>
<td>Mycology Reference Laboratory, PHE South West DX 6120200 BRISTOL 90 BS</td>
</tr>
<tr>
<td>Neisseria meningitidis PCR (meningococcal PCR)</td>
<td>5ml EDTA blood</td>
<td>5-8 days</td>
<td>Meningococcal Reference Unit, Manchester Medical Microbiology Partnership DX 6962410 MANCHESTER 90M</td>
</tr>
<tr>
<td>Neisseria meningitis titles (Meningitis titres) (ACWY titres)</td>
<td>7ml clotted sample</td>
<td></td>
<td>Meningococcal Reference Unit, Manchester Medical Microbiology Partnership DX 6962410 MANCHESTER 90M</td>
</tr>
<tr>
<td>Norovirus PCR</td>
<td>Stool Sample</td>
<td>5 days</td>
<td>Department of Virology, PHE West Midlands. DX 4780102 Birmingham B</td>
</tr>
<tr>
<td>Papillomavirus (HPV)</td>
<td>Contact ref lab</td>
<td>PCR 5-7 days Genotype 16 days</td>
<td>Manchester Medical Microbiology Partnership DX 6962410 MANCHESTER 90M</td>
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<tr>
<td>Parasites</td>
<td></td>
<td>4-9 days depending on test</td>
<td>Liverpool School of Tropical Medicine, Diagnostic Laboratory DX 6966301 LIVERPOOL 92 L</td>
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</tbody>
</table>

#### Parasites
- *Amoebiasis*
- *Fascioliasis*
- *Filariasis*
- *Hydatid disease & serology*
- *Leishmaniasis*
- *Malaria*
- *Schistosomiasis*
- Strongyloidiasis
- Trypanosomiasis

<table>
<thead>
<tr>
<th>Parasites</th>
<th>Duration</th>
<th>Laboratory</th>
<th>Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cysticercosis</td>
<td>12 days</td>
<td>The PHE National Parasite Reference Laboratory, Hospital for Tropical Diseases</td>
<td>020 344 75418</td>
</tr>
<tr>
<td>Toxocara</td>
<td>9 days</td>
<td>DX 6640701, TOTTENHAM CT RD 91 WC</td>
<td></td>
</tr>
<tr>
<td>Trichinellosis</td>
<td>7 days</td>
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Parechovirus PCR
(Usually request HSV and Enterovirus PCR on the same sample)

<table>
<thead>
<tr>
<th>Virus (Parovirus HPV B19)</th>
<th>Duration</th>
<th>Laboratory</th>
<th>Contact Information</th>
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</thead>
<tbody>
<tr>
<td>Serology</td>
<td>12 days</td>
<td>Virus Reference Department, PHE Colindale.</td>
<td>020 8327 6017 or 6266</td>
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<tr>
<td>PCR</td>
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P.C.P. PCR
(Pneumocystis)

<table>
<thead>
<tr>
<th>Pneumocystis detection and confirmation</th>
<th>Duration</th>
<th>Laboratory</th>
<th>Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiratory Sample</td>
<td>1-3 days</td>
<td>Department of Microbiology, PHE West Midlands</td>
<td>0121 424 3256</td>
</tr>
<tr>
<td>Stool sample</td>
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Poliovirus detection and confirmation

<table>
<thead>
<tr>
<th>Poliovirus serology</th>
<th>Duration</th>
<th>Laboratory</th>
<th>Contact Information</th>
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</thead>
<tbody>
<tr>
<td>Stool sample</td>
<td>7 days</td>
<td>Virus Reference Department, PHE Colindale.</td>
<td>020 8327 6017 or 6266</td>
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<tr>
<td>Contact laboratory</td>
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Polyoma Virus PCR
(JC and BK)

<table>
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<tr>
<th>Polyoma Virus PCR</th>
<th>Duration</th>
<th>Laboratory</th>
<th>Contact Information</th>
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</thead>
<tbody>
<tr>
<td>Urine (qualitative)</td>
<td>7 days</td>
<td>Department of Virology, PHE West Midlands.</td>
<td>0121 424 3256</td>
</tr>
<tr>
<td>2ml clotted sample</td>
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<td></td>
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Pseudomonas antibodies

<table>
<thead>
<tr>
<th>Pseudomonas antibodies</th>
<th>Duration</th>
<th>Laboratory</th>
<th>Contact Information</th>
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<tbody>
<tr>
<td>2ml clotted sample</td>
<td>9-12 days</td>
<td>Leeds Teaching Hospital NHS Trust. Clinical Immunology Laboratory.</td>
<td>0113 2433144</td>
</tr>
<tr>
<td>2ml EDTA (quantitative)</td>
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</table>

Q fever

<table>
<thead>
<tr>
<th>Q fever</th>
<th>Duration</th>
<th>Laboratory</th>
<th>Contact Information</th>
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<tbody>
<tr>
<td>2ml clotted sample</td>
<td></td>
<td>Special Pathogens Reference Laboratory, Centre for Emergency, Preparedness &amp; Responses</td>
<td>01980 612348</td>
</tr>
<tr>
<td>PCR – 9 days Serology 4-7 days</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Serology 4-7 days</td>
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<tr>
<td>Test Description</td>
<td>Sample Type</td>
<td>Days</td>
<td>Department/Address</td>
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<td>----------------------------------------</td>
<td>-------------------</td>
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<td>-------------------------------------------------------------</td>
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<tr>
<td>Respiratory PCR</td>
<td>Respiratory Sample</td>
<td>5 days</td>
<td>Department of Virology, PHE West Midlands. DX 4780102 Birmingham B</td>
</tr>
<tr>
<td>Rickettsiae serology</td>
<td>2ml clotted sample</td>
<td>4-7 days</td>
<td>Special Pathogens Reference Laboratory, Centre for Emergency, Preparedness &amp; Responses DX 6930400 SALISBURY 92 SP</td>
</tr>
<tr>
<td>Rotavirus confirmation</td>
<td>Stool sample</td>
<td>Contact lab</td>
<td>Virus Reference Department. PHE Colindale. DX 6530006 COLINDALE NW</td>
</tr>
<tr>
<td>Rubella IgM, IgG &amp; avidity</td>
<td>2ml clotted sample</td>
<td></td>
<td>Preston Microbiology Services, Lancashire Teaching Hospitals NHS Trust DX 6960100 PRESTON 90 PR</td>
</tr>
<tr>
<td>Salmonella serology</td>
<td>2ml serum</td>
<td>14 days</td>
<td>Laboratory of Gastrointestinal Pathogens, Specialist &amp; Reference Microbiology Division DX 6530008 COLINDALE NW</td>
</tr>
<tr>
<td>Sapovirus detection</td>
<td>Stool sample</td>
<td>Contact lab</td>
<td>Virus Reference Department, PHE Colindale. DX 6530006 COLINDALE NW</td>
</tr>
<tr>
<td>Strep. pneumoniae PCR (pneumococcal PCR)</td>
<td>Empyema</td>
<td>5-8 days</td>
<td>Meningococcal Reference Unit, Manchester Medical Microbiology Partnership DX 6962410 MANCHESTER 90M</td>
</tr>
<tr>
<td>TB T-spot test</td>
<td>Refer all enquiries to MDC ext. 9242 QUANTIFERON only available Monday to Thursday 9 days (including IFGA)</td>
<td>Department of Immunology, Birmingham Heartlands Hospital, BIRMINGHAM LIMITED AVAILABILITY! ONLY SAMPLES COMING VIA MDC TO BE REFERRED! SEND BY TAXI ONLY!</td>
<td>Refer all enquiries to MDC ext. 9242</td>
</tr>
<tr>
<td>Teicoplanin levels</td>
<td>2ml clotted sample</td>
<td>3 days</td>
<td>The Regional Antimicrobial Reference Laboratory, North Bristol NHS Trust DX 6121302 WESTBURY TRYM 90 BS</td>
</tr>
<tr>
<td>Tobramycin levels</td>
<td></td>
<td>4 days</td>
<td>Department of Clinical Chemistry, Royal Wolverhampton NHS Trust, Royal Wolverhampton NHS Trust, Wolverhampton Road, WV10 0QP</td>
</tr>
<tr>
<td>Toxocara serology</td>
<td>2ml clotted</td>
<td>9 days</td>
<td>The Diagnostic Parasitology Laboratory, Dept. of Infectious</td>
</tr>
<tr>
<td>Sample Test</td>
<td>Sample Type</td>
<td>Turnaround Time</td>
<td>Laboratory Address</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>------------------------</td>
<td>-----------------</td>
<td>----------------------------------------------------------</td>
</tr>
<tr>
<td>Toxoplasmosis serology</td>
<td>2ml clotted sample</td>
<td>Within 12 working days</td>
<td>Toxoplasmosis Reference Unit, Microbiology, National Public Health Wales, SWANSEA DX 6070300 SWANSEA 90 SA</td>
</tr>
<tr>
<td>Voriconazole levels</td>
<td>2ml clotted sample</td>
<td>3 days</td>
<td>Mycology Reference Laboratory, PHE South West DX 6120200 BRISTOL 90 BS</td>
</tr>
<tr>
<td>VZV PCR</td>
<td>1ml EDTA or CSF</td>
<td>5 days</td>
<td>Department of Virology, PHE West Midlands. DX 4780102 Birmingham B</td>
</tr>
<tr>
<td>West Nile Virus</td>
<td>2ml clotted sample</td>
<td>4-7 days</td>
<td>Special Pathogens Reference Laboratory, Centre for Emergency, Preparedness &amp; Responses DX 6930400 SALISBURY 92 SP</td>
</tr>
</tbody>
</table>