Borders General Hospital

Microbiology Department

Users Handbook

Image shows MRSA growing on Oxoid Brilliance Agar at 24 hours (Image courtesy of Oxoid)
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# Introduction

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- Cerebrospinal Fluid
- Ascitic, pleural, joint or other fluid or tissue from sterile site
- Urine
- Swabs
- Faeces Microscopy & Culture
- Faeces CDT/C.Difficile
- Faeces Virology
- Faeces Helicobacter
- Sputum

### Chlamydia

### Mycology

### Parasitology

### Serological Investigations

#### Serology Performed at BGH
- Monitoring of Antibiotic Therapy
- Ante-natal serology (Rubella, VZV, HIV, Syphilis, HBsAg)
- Hepatitis A IgM
- Hepatitis B surface antigen
- Hepatitis B Surface antibody
- Hepatitis C antibody
- HIV Antibodies
- RA latex
- Rubella
- TPIgG ELISA (Syphilis serology)
- VZV antibody

### Referred Serology

#### Virology Samples
- Atypical pneumonia screen
- Chlamydia antibody
- CMV IgG antibodies
- CMV IgM antibodies
- EBV antibodies
- Hepatitis A antibody(IgG)
- Mumps
- TORCH screen
- Toxoplasma antibodies
- Viral titres

### Immunology

#### Miscellaneous Referral
- Bordetella antibodies (for whooping cough)
- Borrelia antibodies (for Lyme disease)
Legionella
Leptospiral antibodies
Mycobacteria
Parasitology
Precipitins
Widal

REFERENCE LAB DETAILS
CONTACT DETAILS

Key Microbiology Staff:

Dr Ed James  Consultant Microbiologist  ext 26231
Mr Richard Cannon  Diagnostic Services Manager  ext 26428
Mr Peter Machell  Department Manager - Microbiology  ext 26258
Adam Wood  Senior Infection Control Nurse/Manager  ext 26255

Useful telephone numbers:

<table>
<thead>
<tr>
<th>Service</th>
<th>Tel No.</th>
<th>BGH Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Borders General Hospital</td>
<td>01896 826000</td>
<td></td>
</tr>
<tr>
<td>Microbiology Lab.</td>
<td>01896 826250</td>
<td>26250</td>
</tr>
<tr>
<td>Laboratory Result Enquiries/Office</td>
<td>01896 826040</td>
<td>26040</td>
</tr>
<tr>
<td>Laboratory Office Fax</td>
<td>01896 826237</td>
<td></td>
</tr>
</tbody>
</table>

Contact during office hours

Within the BGH use the internal telephone extension (or page) for the department or person you require. Numbers are available on NHS Borders intranet in the on-line telephone directory.

Contact out of hours

The Microbiology department operates a limited on-call service. For urgent out of hours specimens you should ask the switchboard to contact the on call Biomedical Scientist at home.

The Consultant Microbiologist on call can be contacted for clinical advice at any time via the hospital switchboard.

Availability of clinical advice and interpretation of results

During normal opening hours, the Consultant Microbiologist may be contacted within the BGH by telephoning or bleeping 26231, by external call 01896 826231, or via the BGH switchboard.

Out of hours, the Consultant Microbiologist on call may be contacted for clinical advice at any time via the hospital switchboard. The on call rota is supported by Consultants from other hospitals.
LOCATION

The Laboratory Suite is situated on the second floor of the Borders General Hospital, on the corridor leading into Main Theatres, Recovery Area and Intensive Care Unit.

During normal office hours (Monday to Friday 9 a.m. to 5 p.m.), the laboratory reception is staffed. Specimens may be left in the specimen reception area, and queries will be forwarded to individual departments by the receptionist. It is important to notify the receptionist if an urgent specimen analysis is required.

Out of hours access to the laboratory is restricted to authorised holders of electronic swipe cards. Card holders are permitted to enter the outer double doors of the lab, and ‘post’ samples through the letter box in the inner set of doors.

HOURS

Laboratory Hours

Comprehensive Service:
Monday to Friday 9 a.m. to 5 p.m.
The Laboratory is fully staffed on weekdays and is open for the receipt of specimens for routine, emergency and for special investigations.

Limited Service:
Saturday 9 a.m. to 12 noon
Public Holidays

On Saturday mornings a reduced staff can only accept specimens for processing which are required that day for the immediate clinical care of patients. Specimens for routine investigations should not be sent to the laboratory on Saturday mornings.

Emergency Service Only:
Weeknights 5 p.m. to 9 a.m.
Saturday 12 noon to Monday 9 a.m.

Out of Hours requests

Out of hours requests should be restricted to those tests that are required for the immediate management of the patient and will give a rapid meaningful result. Mostly this will involve samples where it is possible to obtain a meaningful gram stain/microscopy result e.g. CSF, sterile fluids.
It is not appropriate to call in the On Call BMS to set up cultures, as the results will not be available for 18 –24 hours following culture.
Blood cultures which are taken out of hours should be placed in the incubator in the specimen reception area of the Laboratory.
All other non-urgent samples taken out of hours should be posted through the letter box in the Laboratory door. These will be refrigerated overnight in the Microbiology Department. It is not necessary to inform the On Call BMS that you have taken specimens unless you require them to process the specimen urgently.

If you require the On Call BMS to attend the Laboratory to process a specimen they must be contacted through the switchboard.

Antibiotic levels will only be measured from 5pm – 9am by prior arrangement with the Consultant Microbiologist.

All On Call Microbiology results will be phoned to the requesting doctor and where possible will be validated so that they are available for viewing electronically.

The On Call BMS will not attend the Laboratory Out of Hours to look up results.

SPECIMEN LABELLING CRITERIA

All samples must be unambiguously labelled with 2 identifiers to include full name - surname & forename (this should be the name on the patient’s health record which may not be the name by which they are known) and either CHI, Date of Birth or CRN. Addressograph labels are acceptable for Microbiology samples.

If samples are inadequately labelled they will not be processed. Exceptions will only be made for samples considered to be un-repeatable or ‘precious’ e.g. CSF.

COMPLETION OF THE FORM

All forms must be legibly & adequately completed to allow appropriate investigations to be carried out & interpretation of results and to ensure that the result is returned to the original requester.

Details provided must include:

Patient’s full name & either CHI, Date of Birth or CRN. Addressograph labels are acceptable.
Name of requesting clinician & source should be written on the form along with signature & bleep number (for BGH).
Name & source for any additional copies of the report.
Specimen type & site e.g. site of wound
The date & time of the sample
Investigations required.
Full clinical details as appropriate including signs & symptoms, foreign travel, contact with animals, occupation, social factors.
Any antibiotics that the patient is currently on, has been on or is being prescribed.
For therapeutic drug monitoring the dosage & time of dose must be given.
SPECIMEN COLLECTION

General procedure

<table>
<thead>
<tr>
<th>Action</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explain and discuss procedure with patient.</td>
<td>Ensure patient understands procedure and gives consent</td>
</tr>
<tr>
<td>Decontaminate hands appropriately</td>
<td>Reduce the risk of infection transmission, Minimise contamination</td>
</tr>
<tr>
<td>Place specimens and swabs in appropriate, correctly labelled containers</td>
<td>To ensure organisms for investigation are preserved.</td>
</tr>
<tr>
<td>Send specimens to laboratory promptly, with fully completed request form.</td>
<td>To ensure correct results are attributed to correct patient</td>
</tr>
</tbody>
</table>

If specimens cannot be sent to a laboratory immediately, they should be stored as follows:
- Blood culture samples in a 37°C incubator (in Specimen Reception area of Lab)
- All other specimens in a specimen refrigerator at a temperature of 4°C, where the low temperature will slow the bacterial growth

Resources available

Swabs – microbiology
Black or blue topped swabs with transport media: Use for all swab samples unless specifically stated otherwise. Dry swabs should not be sent as this can limit pathogen survival. Available from stores.

Other samples e.g. sterile fluids, tissue, done should be collected into a sterile plain universal container, available from stores.

Swabs – virology
Swabs for viral culture or PCR should be placed into the pink virus transport media, available from the microbiology department

Chlamydia
Swabs should be placed into the pink virus transport media, available from the microbiology department.
Urine should be sent in sterile white topped universals – available from stores. Boric acid samples are not suitable for Chlamydia.

Mycology
Special transport envelopes available from microbiology laboratory.
**Blood Cultures**
Bottles available from Microbiology:
Aerobe – Blue, Anaerobe – Purple, Paediatric – Yellow

**Sputum Containers**
Plastic 60ml wide topped with plastic lid.
Available via stores Department.

**Urine containers**
Boric acid – red top, for collections where sample will take longer than 6 hours to reach Laboratory.
Plain, white top, universals for Chlamydia and any urine where immediate transport to the Laboratory is available.
Both available from stores.
No other containers should be used for Microbiology testing and may/will be rejected.

**Faeces Containers**
Blue topped with ‘spoon’. Available from stores.
## MICROBIOLOGY SPECIMEN COLLECTION

<table>
<thead>
<tr>
<th>Container/Tube</th>
<th>Main Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brown Serum Gel</td>
<td>Most Microbiology Serology e.g. Antibiotic Monitoring, Viral Serology, Antenatal Serology, Immunology, Rheumatoid Factor, Lymphocytotoxic Antibodies, Legionella, Lyme Disease, Not for Tissue Typing, check with Lab</td>
</tr>
<tr>
<td>Pink EDTA</td>
<td>Hep C PCR/Genotyping, HIV Viral Load, HepB DNA Quantitation, CMV PCR, HLA B27, Meningococcal PCR</td>
</tr>
<tr>
<td>Neutral</td>
<td>NOT SUITABLE FOR ANY MICROBIOLOGY TESTS</td>
</tr>
<tr>
<td></td>
<td>Adult Blood Cultures</td>
</tr>
<tr>
<td></td>
<td>Paediatric Blood Culture</td>
</tr>
<tr>
<td></td>
<td>Urine for MC&amp;S</td>
</tr>
<tr>
<td>Specimens</td>
<td>Details</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Urine for Chlamydia, Legionella or CMV</td>
<td>Sterile fluids/tissue e.g.</td>
</tr>
<tr>
<td>CSF</td>
<td></td>
</tr>
<tr>
<td>Joint Fluid</td>
<td></td>
</tr>
<tr>
<td>Pleural Fluid</td>
<td></td>
</tr>
<tr>
<td>Ascitic Fluid</td>
<td></td>
</tr>
<tr>
<td>Pus</td>
<td></td>
</tr>
<tr>
<td>Bone Chips</td>
<td></td>
</tr>
<tr>
<td>Faeces</td>
<td></td>
</tr>
<tr>
<td>Sputum</td>
<td></td>
</tr>
<tr>
<td>Bacteriology Culture Swab</td>
<td></td>
</tr>
<tr>
<td>Swab for Chlamydia</td>
<td></td>
</tr>
<tr>
<td>Swab for Viral Culture e.g. Herpes</td>
<td></td>
</tr>
<tr>
<td>Swab for Viral PCR e.g. Atypical Pneumonia, Flu, Mycoplasma</td>
<td></td>
</tr>
<tr>
<td>Skin Scrapings, Nail Clippings &amp; Hair for Mycology (Fungi)</td>
<td></td>
</tr>
</tbody>
</table>

**Specifics on specimen collection.**

Where possible all specimens should be taken prior to commencing antimicrobial therapy.

**Blood Cultures**

In most circumstances the aerobe and anaerobe bottles will suffice. In paediatrics where low, less than 5 - 10ml per bottle, are expected then the yellow bottles should be used.

Volumes – paediatric bottle - ideal 1- 5ml

Others, ideal is 5 - 10ml per bottle.

Always follow aseptic procedure when taking blood cultures and sterilise skin with standard product in use.

Always fill blood culture bottles prior to any other tubes.

Blood cultures MUST be taken at appropriate clinically indicated times NOT as part of a phlebotomy “sweep”. Blood cultures are NOT routine samples.
<table>
<thead>
<tr>
<th>Action</th>
<th>Action Comments</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye swab</td>
<td>Gently evert lower eyelid. Using swab held parallel to cornea gently rub conjunctiva of lower eyelid. Chlamydia swab if required should be taken after bacterial swab.</td>
<td>In all but superficial eye infections corneal scrapings may be required. Please discuss with ophthalmology. If both eyes to be swabbed a separate swab should be used for each.</td>
</tr>
<tr>
<td>Ear swab</td>
<td>Place swab into outer ear and rotate gently</td>
<td>No drops/antibiotics/other chemotherapeutic agents should have been used in the aural region for 3 hours prior to taking the swab.</td>
</tr>
<tr>
<td>Nose swab</td>
<td>Moisten swab with sterile saline or transport media swab the anterior nares by gently rotating swab. The same swab can be used for both nostrils.</td>
<td></td>
</tr>
<tr>
<td>Pernasal swab</td>
<td>Pass special soft mounted wire swab along the floor of the nasal cavity, to the posterior wall of the nasopharynx. Rotate gently. Swabs can be obtained from the microbiology department. Care needs to be taken to minimise trauma and to ensure the correct area is sampled.</td>
<td></td>
</tr>
<tr>
<td>Throat swab</td>
<td>The patient should stick out their tongue whilst the swab is guided down the side of the throat to make contact with the tonsillar fossa or any other area with a lesion or exudates. If concerns re atypical pneumonia/viral infections a throat swab should be sent in virus transport media.</td>
<td>A tongue depressor may be required. Avoid touching any other area of the mouth or tongue in order to minimize contamination.</td>
</tr>
<tr>
<td>Sputum</td>
<td>Ensure specimen is sputum, not saliva. Encourage patients who have difficulty producing sputum to cough deeply first thing in the morning. Physiotherapy may also be helpful in getting a sample.</td>
<td>Send sputum to lab immediately – delays can lead to overgrowth of contaminating flora, and the death of potentially pathogenic flora.</td>
</tr>
<tr>
<td>Wound swab</td>
<td>Do not routinely sample wounds/ulcers – only sample if infection suspected. Take swabs prior to dressing. Rotate swab gently over area to be sampled. Pus, if present should be sent in preference to a swab – send in a sterile screw capped container.</td>
<td></td>
</tr>
<tr>
<td>Ulcer swab</td>
<td>Clean chronic ulcers with sterile saline prior to sampling. Take swab from inflamed tissue. Do not sample routinely.</td>
<td></td>
</tr>
<tr>
<td>High Vaginal swab</td>
<td>Introduce speculum into vagina to separate the vaginal walls. High vaginal swabs are the idea – avoid contamination with vulval/skin flora by the others.</td>
<td></td>
</tr>
<tr>
<td>Roll swab over vaginal vault sampling the lateral and posterior fornices</td>
<td>use of a speculum</td>
<td></td>
</tr>
<tr>
<td><strong>Endocervical swab</strong></td>
<td>Introduce speculum into vagina to obtain a clear view of cervix. Swab should be rotated gently in the endocervical os. If testing for Chlamydia, a second swab should be taken and placed in viral transport media.</td>
<td>Avoid touching vaginal walls to minimise contamination. Chlamydia swabs should be rotated a little more firmly as seeking to collect epithelial cells.</td>
</tr>
<tr>
<td>---</td>
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<td>---</td>
</tr>
<tr>
<td><strong>Penile swab</strong></td>
<td>Retract prepuce. Gently rotate swab in urethral meatus. If gonorrhoea is suspected, send a swab from the distal 1-2cm of the urethra.</td>
<td>Gently insert and rotate swab. Send to lab promptly in transport media.</td>
</tr>
<tr>
<td><strong>Rectal swab</strong></td>
<td>Pass swab carefully through anus into rectum. Rotate gently. If threadworms suspected take swab from perianal region, and break off into bijou of sterile saline (available from lab). Alternatively take sellotape slide.</td>
<td>Aiming to minimise trauma and ensure a rectal (and not anal) sample is taken. Threadworms lay their ova on perianal skin. Sellotape slides are taken by pressing a piece of sellotape to the perianal skin, and placing onto a microscope slide. They are best taken first thing in the morning.</td>
</tr>
<tr>
<td><strong>Faeces</strong></td>
<td>Where possible, ask the patient to defecate into a clinically clean bedpan. Scoop enough material to fill a third of the specimen container using the spatula / spoon. (If liquid faeces, approximately 15mls should be collected). Examine the specimen for such features as colour, consistency and odour.</td>
<td>Aiming to minimise contamination. If patient is collecting sample at home advise to avoid contamination with urine/disinfectants, and to label clearly. If ova/cysts/parasites suspected, up to 3 samples over the space of a week may be required to improve detection rates.</td>
</tr>
<tr>
<td><strong>Faeces cont</strong></td>
<td>Segments of tapeworm are seen easily in faeces &amp; should be sent to the laboratory for identification. Patients suspected of suffering from amoebic dysentery should have any stool specimens dispatched to the laboratory immediately for identification.</td>
<td>The parasite causing amoebic dysentery is characteristic in its fresh state, but is difficult to identify when dead – timescale is within 1 to 2 hours.</td>
</tr>
</tbody>
</table>
| **Urine** | Specimens of urine should be collected as soon as possible after the patient wakens in the morning and at the same time each morning if more than one specimen is required. Dispatch all specimens to the laboratory as soon after collecting as possible. | The bladder will be full due to overnight accumulation of urine. Later specimens may be diluted. Urine samples should be examined within 2 hours of collection, or refrigerated. At room temperature bacterial overgrowth will occur and may...
<table>
<thead>
<tr>
<th>Specimen</th>
<th>Instructions</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midstream specimen of urine (male)</td>
<td>Retract the prepuce and clean the skin surrounding the urethral meatus with water. Ask the patient to direct the first and last part of his stream into a urinal or toilet but to collect the middle part of his stream into a sterile container.</td>
<td>Aiming to prevent contamination.</td>
</tr>
<tr>
<td>Urine for Chlamydia</td>
<td>First void urine of the day should be placed into a sterile container (White topped). If first void not collected, wait until patient has not micturated for 1-2 hours, then collect first void.</td>
<td>Do not use boric acid containers.</td>
</tr>
<tr>
<td>Midstream specimen of urine (female)</td>
<td>Clean the urethral meatus with water. Use a separate gauze swab for each cleansing swab. Clean from the front to the back. Ask the patient to micturate into a bedpan or toilet. Place a sterile receiver or a wide mouthed container under the stream and remove before the stream ceases. Transfer the specimen into a sterile container.</td>
<td>Aiming to prevent contamination, particularly with perianal flora.</td>
</tr>
</tbody>
</table>
Chlamydia – Clinician obtained swab

The pack should only be opened immediately before use, removing the swabs from the packet and using immediately.

Female Endocervical Samples

Remove mucus/discharge from the exocervix with the large swab and discard
Insert the small swab into the endocervical canal until tip is no longer visible
Rotate 3-5 seconds. Withdraw, avoid contact with vaginal surfaces

Male Urethral Samples

If possible avoid urination for 1 hour prior to sampling
Insert small swab 2-4cm into the urethra
Rotate 3-5 seconds. Withdraw

A. Aseptically remove cap from vial
B. Insert swab into medium
C. Break swab shaft evenly at the scored line (approx 5 cm from non-swab end of shaft).
D. Replace cap to vial and close tightly
E. Label with appropriate patient information

Chlamydia – Self-taken swab, advice for patients

Remove your underwear. Wash and dry your hands.

Open the packaging. Throw away the swab with the plastic shaft – you don’t need this.

You are going to use the other swab (with the thin metal shaft) to take your sample. Don’t remove it from the packaging until you are ready to use it. (Don’t put it down on the floor or the sink!).

Remove the red cap from the sample tube. Take the swab from the packaging.

Insert the swab about half a finger length into your vagina.

Swirl it around gently for about 10 seconds, so that it touches the sides of your vagina.

Put the swab straight into the sample tube (without putting it down) and break the stem off.

If it doesn’t break off, pull it a little way out of the tube and try again.

Put the cap back on the tube tightly.

Give it back to the doctor or nurse.
Skin, Hair & Nails for Mycology

It is often helpful to clean lesions of the skin or scalp (and sometimes nail) with surgical spirit or 70% alcohol prior to collection of samples as this improves the chances of detecting the fungus by microscopy and also reduces the likelihood of contamination of subsequent cultures. Prior cleaning is essential if greasy ointments or powders have been applied to the region.

Material from skin lesions should be collected by scraping outwards from the edges of the lesions with either a blunt scalpel blade or with the edge of a glass microscope slide. The edge of the lesion is where there is likely to be most viable fungus.

Specimens from the scalp are best obtained by scraping with a blunt scalpel. The sample should include hair stubs, the contents of plugged follicles and skin scale. Hairs may also be plucked from the scalp with forceps. Cut hairs are unsatisfactory as the focus of infection is usually below or near the surface of the scalp.

Nail clippings should be taken from any discoloured, dystrophic or brittle parts of the nail. These should be cut as far back as possible from the free edge of the nail and include its full thickness. Fungus in the distal part of the nail is often non-viable and although it may be visible of microscopy it fails to grow in 40-50% of cases.

Please send as much sample as is available to ensure both quality and quantity of material. A substantial amount of sample is required to allow for both microscopy and culture.
Analysis of antibiotic levels.

Detailed information on antibiotic levels is given in NHS Borders ‘Antimicrobial guidelines for hospitals’

**Antimicrobial Guidelines for Hospitals**

<table>
<thead>
<tr>
<th>Specimen</th>
<th>Action</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gentamicin trough</td>
<td>Using sterile technique withdraw 5-10 mls of blood (serum gel tube)</td>
<td>Ensure sample is not drawn from a device previously used to administer antibiotics as this may give false levels.</td>
</tr>
<tr>
<td>Once daily dosing</td>
<td>Sample should be taken 6-14 hours post dose. Label clearly as ‘Trough’</td>
<td></td>
</tr>
<tr>
<td></td>
<td>and include time of taking sample and time dose was given.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gentamicin Trough</td>
<td>Level should be taken immediately before the dose</td>
<td>Take from different site to infusion</td>
</tr>
<tr>
<td>Multiple daily dosing</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Level should be taken 1 hour after the end of the gentamicin infusion. Label clearly as peak</td>
<td></td>
</tr>
<tr>
<td>Gentamicin Peak</td>
<td></td>
<td>Peak and trough should be sent to lab together</td>
</tr>
<tr>
<td>Multiple daily dosing only</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vancomycin trough</td>
<td>Using sterile technique withdraw 5-10 mls of blood (serum gel tube)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Take sample immediately before administration of next dose.</td>
<td></td>
</tr>
<tr>
<td>Vancomycin peak</td>
<td>Not required</td>
<td>The Lab will not process samples labelled as vancomycin peak</td>
</tr>
</tbody>
</table>

For specimens not covered by these policies, please discuss with microbiology.
SPECIMEN TRANSPORT & REPORT DELIVERIES

Internal BGH arrangements

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday – Friday 09.30 – 10.30 a.m.</td>
<td>Specimen collection</td>
</tr>
<tr>
<td>11.15 – 11.45 am</td>
<td>Specimen collection</td>
</tr>
<tr>
<td>12.30 – 1.30 p.m.</td>
<td>Specimen collection</td>
</tr>
<tr>
<td>3.15 – 4.15 p.m.</td>
<td>Specimen collection</td>
</tr>
<tr>
<td>12.30 – 1.30 p.m.</td>
<td>Delivery of reports</td>
</tr>
<tr>
<td>3.15 – 4.15 p.m.</td>
<td>Delivery of reports</td>
</tr>
</tbody>
</table>

Routine samples will be collected on ward rounds as detailed above. The Lab Porter should only be bleeped to collect urgent specimens.

Transport

ALL samples MUST be transported within sealed specimen bags with an attached request form – these bags all contain an absorbent pad sufficient to absorb “spilled” material if necessary.

The GP practice or Community Hospital should ensure samples are stored appropriately – i.e. in a sealed leak proof container whilst awaiting “pick up”. These users will also have responsibility for ensuring the samples are held under the appropriate conditions to ensure accuracy and validity of future examinations. If samples are to be collected the same day they may be left at room temperature. If there is likely to be a delay before samples are collected e.g. overnight or at weekends, samples should be refrigerated.

The BGH operates a courier system, under the control of the Estates/Facilities Department, which will “pick up” samples twice a day from the specified locations. Users are responsible for ensuring samples are available at these points and times. The BGH couriers are manned by drivers trained in specimen transport who will ensure samples are all placed in sealed UN3373 transport containers and returned to the BGH stores area where they will be handed over to the Laboratory porter who will bring the samples, in the transport container, to the Laboratory. On the evenings at approximately 5 o’clock the courier drivers will deliver the samples to the Laboratory themselves.

Issues regarding the courier system will be dealt with by the Facilities/Domestic service lead, who will also ensure compliance with Transport regulation through their arrangements with a contracted Transport regulation officer.

Specimens for Edinburgh laboratories

Routinely these are collected from the Laboratory at 12.15 p.m. to be transported by the Edinburgh Courier at 12.30 p.m.
SHARPS INJURY POLICY

Information on the procedure for dealing with sharps injuries can be found in the Occupational Health & Safety Manual.

INTRODUCTION

Specimens are collected from all wards, or by courier, at the time specified and printed results delivered daily. Results will be available electronically on SCI Store or Web Browser as soon as they have been validated. Results will be sent out as soon as available, but you may inquire about progress of any specimen at any time (by telephone or in person). Similarly, progress may be reported to you, if thought appropriate.

The time taken to process microbiology specimens is very variable, and an indication of the expected time-scale is given in the next section & in the complete list of tests. Please bear in mind that this is the shortest time the Lab will need to process the sample and does not take account of the time taken for the sample to get to the Lab and the printed result to get back to the requester. Where samples are getting a number of different tests the result will not be issued until all the tests are complete. For instance microscopy/gram film may only take 30 minutes but the result will not be issued until the culture is complete which may take several days. If you wish to discuss preliminary results for a sample please telephone the Microbiology Department.

The main tests are listed below. For any not listed, or to discuss the tests appropriate to a particular diagnostic problem, contact the Consultant Microbiologist or the laboratory.

Due to the nature of microbiology specimens it is not usually possible (with the exception of viral serology) to add on additional requests. It is often better that a fresh sample is obtained. Any additional requests must be discussed with the Microbiology Lab (no add-on forms) who will advise accordingly.

Where possible please send separate samples for tests done in different departments. It is not always possible to share samples and delay in returning results is inevitable.

AMENDMENTS/ADDITIONS SINCE LAST HANDBOOK

Enterovirus screens, including Coxsackie are done by PCR on a throat swab in viral transport medium. A faeces sample may be sent in addition if available.

ASO – Tests are no longer available onsite at the BGH. This test is now sent to the Health Protection Agency at Colindale, requests for Streptococcal serology should be discussed with the Consultant Microbiologist.
Norovirus PCR - Both faeces & vomit are suitable for testing

Chlamydia – women not undergoing a vaginal examination can be offered the choice of a self-taken vulval swab or a urine sample. See above for self-taken vulval swab instructions.

RAST/Allergen testing – Samples will not be processed unless specific allergens are requested and full clinical details provided. Samples will be stored until such information is received.

COMMON ERRORS

Insufficient detail given on the request form, this may require further discussion with requestor to determine which tests (if appropriate) are required, whether the sample is appropriate for that test and when results are available what extra interpretation or advice may be helpful.

Requester’s name and location not indicated. This is a particular problem in the BGH if addressograph labels are used without filling in the Consultant & Source boxes. In these cases the result is invariably sent back to the GP as this is the name on the addressograph sticker.

Brown serum gel tubes are most commonly used for Microbiology serology tests but there are important exceptions (see below). Plain/neutral blood tubes with white lids should not be used for any serology tests (these are intended for taking blood cultures). Blood in these tubes does not clot well thus it is often difficult to separate serum from red cells. Full details of the correct tube/specimen are given in the list of tests.

HLA B27 testing requires a large 7.5mL EDTA blood sample.

Other tissue typing requests require a variety of tubes; please contact the Lab for details.

All blood requests for PCR testing e.g. CMV PCR, HIV, Hep C Viral Load testing, Meningococcal, Pneumococcal, Haemophilus PCR (for cases of suspected invasive disease) require an EDTA blood tube. For CMV, HIV & Hepatitis a large 7.5mL EDTA sample should be sent.

Coeliac testing is done by Chemistry not Microbiology

Immunoglobulins (IgA, IgG & IgM) are done by Chemistry not Microbiology

Thyroid Receptor Antibodies (TRAB) is done by Chemistry not Microbiology

Thyroid Auto Antibodies/Thyroid peroxidase (TPO) is done by Microbiology not Chemistry
Gentamicin requests are run in Microbiology not Chemistry. A separate sample should be sent for Gentamicin testing, combining Chemistry & Microbiology requests on the same sample/request leads to delays in processing of the Microbiology component – as Chemistry only release these after initial testing.

Legionella requests require both a blood sample (brown serum gel tube) AND a urine sample (plain plastic white top universal) for most effective diagnosis.

Pneumococcal antigen testing on blood or urine samples is not available.

Helicobacter testing is done by stool antigen test.

Atypical pneumonia screens –Diagnosis of the more common respiratory viral infections (Influenza A and B, RSV, Adenovirus and Parainfluenza viruses) & Mycoplasma is performed on respiratory samples not bloods by PCR. Suitable samples are Nose/Throat swabs or nasopharyngeal aspirates. Swabs must be taken in viral transport media.

The bar code labels should be left on blood culture bottles. These are required by the Lab.

**BACTERIOLOGY SPECIMENS**

Culture will always be for appropriate organisms based on clinical details, site etc. Both positives and negatives can take up to four days before a final report can be issued. An "urgent" culture cannot be done; a phone call for a progress report is far more useful.

**Blood Cultures**

(Up to 5 days, interim results issued after 48 hours, positive results will be telephoned. Sample volume 5-10mLs for adults, 1 - 5mLs for paediatric bottles)

Bottles of medium are available from the laboratory. Blood should be obtained by venepuncture, and upto 10ml transferred aseptically to each of the bottles, using a clean needle. The blood culture system in this laboratory uses double bottles for all organisms, except with Paediatric bottles. In exceptional circumstances paediatric bottles may be used for adults where only a very small volume of blood can be obtained. Blood cultures are incubated for up to 5 days; interim reports are issued after 48 hours. Positive results will be phoned as soon as available and are usually preliminary; Consultant Microbiologist must be contacted for antibiotic or therapy advice. Full ID and sensitivities will usually be available the following day. The accurate labeling of blood culture bottles is essential. The bar code labels should be left on the bottles. Outside normal hours, please place inoculated blood cultures in incubator in the laboratory foyer. It is not necessary to phone the On Call BMS to advise them that you have taken blood cultures.
**Cerebrospinal Fluid**

(1 hour for microscopy, 2 days for culture. No minimum sample volume, tests will be prioritised on tiny sample volumes)

Should be sent in up to three sterile universal containers for clinical chemistry and microbiology. If only one specimen is obtained, it should go to microbiology first; it will be passed on to the other laboratories as requested. All relevant samples will be referred for virology. Cell counts cannot be performed on clotted samples.

Subarachnoid haemorrhage: Three separate specimens of CSF should be collected in separate bottles; samples 1 & 3 will be cell-counted. Assessment of xanthochromia is available on sample 2 from the Chemistry department. Out of hours, the BMS on call for microbiology must be called to examine CSF when obtained, even if it looks clear to the naked eye.

**Ascitic, pleural, joint or other fluid or tissue from sterile site**

(1 hour for microscopy, up to 4 days for culture. Minimum sample volume 1mL, tests will be prioritised on smaller sample volumes)

Use sterile universal container without boric acid. Do not add formal saline to tissue/bone.

Pleural fluids are always processed for AFB’s. Joint fluids are always examined for crystals.

Cell counts are NOT normally performed as they are of limited value, although a qualitative assessment of white cells present (e.g. +, ++, ++++) will usually be made. Please send separate samples for bacteriology and cytology where possible.

**Urine**

(30 minutes for microscopy, 2 - 3 days for culture. Minimum sample volume 5 mLs)

For routine culture, a mid stream or aseptically obtained catheter specimen should be collected into a sterile universal with boric acid preservative (red cap). If delay is likely, the specimen should be refrigerated.

Microscopy for AAFB is NOT performed on urine samples as results are of little diagnostic benefit. All requests for “TB” will be referred to the Mycobacterium Reference Laboratory for culture.

A wet film result can be telephoned within thirty minutes of receipt of the specimen. Most positives are returned with full sensitivities within 48 hours of receipt - thus results are not often telephoned unless specifically requested.
**Swabs**

(1-4 days, most will be available in 2 days)

Better results are usually obtained from bulk material e.g., drained or aspirated pus, than from a swab. Swabs with transport medium are available from the stores. Please do not send dry swabs.

Culture for gonorrhoea will only be performed on urethral or endocervical swabs (not HVS).

Gram stained films are not performed on eye/ear/nose/throat/superficial wound or vaginal swabs as these are of little predictive value in specimens from these sites. Swabs from multiple sites must be clearly labelled to ensure useful results.

If **no clinical details** are provided then **no interpretation** of results is possible.

Swabs of BCG sites will be examined for evidence of secondary bacterial infection only - examination for TB is of no value.

If MRSA culture is required this must be clearly stated on the request form. For MRSA screening all appropriate sites should be sampled. Full details are available in the Infection Control Manual.

**MRSA policy**

MRSA results may take up to 4 days. Negatives are available at 24 hours for swabs sent during normal laboratory working hours. Preliminary positive results may be available at 24 hours for swabs sent during normal hours. Preliminary positive results for inpatients are discussed with the Infection Control Team who will advise the ward.

**Faeces Microscopy & Culture**

(2-4 days. Should be sent in the special blue topped universal containers for the purpose. A substantial amount of material is required for all faeces investigations, without overflowing the container).

Examination for parasites or viruses will only be done when requested or specifically indicated by relevant clinical details.

All specimens are examined by microscopy for *Giardia intestinalis* and *Cryptosporidium* spp, and by culture for *Salmonella* spp., *Shigella* spp., *Campylobacter* spp., and *E coli* (serotype O157).

If clinical details are provided indicating foreign travel to developing countries microscopy for a variety of parasites will be done.

Multiple samples are not routinely indicated, if required please discuss with Consultant Microbiologist.

Follow up samples e.g. positive *Salmonella* or *Campylobacter* are not routinely done & will only be performed if requested by Public Health.
**Faeces CDT/C.Difficile**

(1 day.)

*Clostridium difficile* Toxin A/B can be tested for if relevant, but will only be done on diarrhoeal samples (samples that are liquid and freely take the shape of the specimen container). Clinical details must include details of antibiotic therapy. CDT tests are done daily Monday - Friday with results usually being available by 5pm. This test is not routinely offered “out of hours”. Please discuss with Consultant Microbiologist if there is a problem.

**Faeces Virology**

Rotavirus can be tested for on request. In addition all samples from children under five years are routinely tested. Results are usually available within 24 hours.

Norovirus PCR can be performed on stool or vomit samples in outbreak situations. Samples are referred to the Regional Virus Lab, results may take several days. Please discuss with Consultant Microbiologist.

**Faeces Helicobacter**

Helicobacter pylori antigen testing is performed on stool samples. Testing is not appropriate on diarrhoeal samples or if the patient is on antibiotics or proton pump inhibitors. The patient should have finished antibiotics 4 weeks and proton pump inhibitors 2 weeks before a Helicobacter test is done. Helicobacter tests are run in weekly batches, usually on a Thursday. Results are usually available by 5pm on the day of testing.

**Sputum**

(1 hour for microscopy, 1-4 days for culture, minimum sample volume 5mLs).

Early morning specimens are normally more helpful. Please send in sterile sputum container.

Examination for tubercle bacilli will only be done if specifically requested. Microscopy for acid fast bacilli is performed at BGH, results are usually available within 24 hours (1 hour for urgent requests). Respiratory samples are referred to the Scottish Mycobacteria Reference Laboratory for culture. Results are usually returned after 8 weeks.

*Pneumocystis jarowecki* can be examined for by arrangement with the laboratory. Suitable samples are bronchial washings/aspirate and induced sputum only (normal sputum samples will not be processed). Samples are referred to the Regional Virus Lab, results may take several days. Please discuss with Consultant Microbiologist. For Legionella spp, please send bronchial washings for culture, urine for antigen detection or paired sera for antibody titres.
CHLAMYDIA

(5 days)

Testing for genital *Chlamydia trachomatis* infection is by PCR.

For Chlamydia testing the specimen of choice is:

<table>
<thead>
<tr>
<th><strong>FEMALE</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergoing vaginal examination – <strong>Endocervical swab (not HVS) is best choice</strong></td>
</tr>
<tr>
<td>NOT undergoing vaginal examination – Urine, first void sample, white-top universal or self-taken vulval swab.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>MALE</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>From a patient’s perspective a <strong>first void urine sample is preferable</strong> (white-top universal)</td>
</tr>
<tr>
<td>N.B. In males urethral swabs and urine are of approximately equal sensitivity</td>
</tr>
</tbody>
</table>

If sending urine samples the specimen of urine should be a first void sample; the patient should not have urinated for one hour prior to collection of the specimen. A white-top universal should be used; red-top boric acid containers are not suitable. The minimum sample volume is 5mLs.

Swabs should be sent in the appropriate transport media (viral swabs, pink liquid, red lid). These swabs are available from the Microbiology Department.

For other specimen types e.g. eye swabs, rectal swabs please contact the Consultant Microbiologist for advice.

It should be noted that some specimens contain inhibitors to this PCR method and will be reported as ‘INHIBITORY’ with a suggestion to repeat the sample.

Chlamydia testing is performed daily in a batch. Results are usually available within 5 days. If an urgent result is required please contact the Microbiology Department.

MYCOLOGY

A full diagnostic service from all clinical samples is provided. Microscopy results are available within 24-48 hours, culture takes up to 4 weeks.

Sample collection packs are available from the laboratory.

Samples of skin, hair and nails can also be sent in sterile universal containers (white topped) if collection packs are not available.

Please send as much sample as is available to ensure both quality and quantity of material. A substantial amount of sample is required to allow for both microscopy and culture.
PARASITOLOGY

A full diagnostic service for all faecal, blood and tissue parasites is offered. A substantial amount of material is required for faeces investigations, without overflowing the container.

Please note malarial films are performed by the Haematology Department.

An identification service for arthropods and flies (of medical importance) is available in addition.

Please contact the Laboratory for information on specific requests.

SEROLOGICAL INVESTIGATIONS

We offer a wide range of serological tests, some of which are performed in this laboratory and others which we refer to other centres. Please contact the laboratory to discuss your particular diagnostic problem.

All specimens for serology MUST be sent to the BGH laboratory. There the specimen will be either processed, or recorded and packed according to Post Office regulations for transport to the appropriate secondary referral laboratory.

For all tests at least one full tube of blood should be sent. This should allow performance of all tests including any confirmatory testing and also allow for some serum to be stored for future reference. If multiple tests are requested, particularly if some of these tests are referred to external labs more than one tube should be sent. If insufficient serum is available tests will be prioritized based on the clinical details given or the serum will be stored for the requesting clinician to determine which tests to prioritize. Paediatric tubes are available and should be used when only very small volumes of blood can be obtained.

Where possible please send separate samples for tests done in different departments. It is not always possible to share samples and delay in returning results is inevitable.

SEROLOGY PERFORMED AT BGH

All tests are performed upon serum. Please send clotted sample - brown topped, serum gel tube (although plasma can be used for certain tests). Plain-neutral blood tubes with white lids should not be used for any serology tests. Blood in these tubes does not clot well thus it is often difficult to separate serum from red cells

Please contact laboratory to discuss any particular requirements – a list of all tests and specimen requirements is attached.

Please note most virology tests are performed in twice-weekly batches, thus results can take several days to be returned. If results are required urgently this should be discussed with the Consultant Microbiologist. In urgent cases results can usually be available within 1 hour.

It is sometimes necessary to refer samples to other laboratories for further testing. In these cases results will take longer to be returned, usually 10 to 14 days.
Monitoring of Antibiotic Therapy

Samples for monitoring of all antibiotics, most commonly Gentamicin & Vancomycin should be sent to Microbiology. Any queries should be discussed with the Consultant Microbiologist or the Microbiology Department. During normal working hours results are usually available within 1 hour. If results are required more urgently please phone the Microbiology Department.

Please follow guidance given in Antimicrobial Therapy Handbook and formulary. Advice on specimen collection is available earlier in this document.

Antibiotic Guidelines

Ante-natal serology (Rubella, VZV, HIV, Syphilis, HBsAg)

Ante-natal tests are performed twice-weekly usually on Mondays & Thursdays (with the exception of VZV testing which is usually on a Tuesday). Unless specified all samples will be run for all tests. If the patient has not consented to all tests this must be specified on the request form detailing which tests are not required. Results are usually available within 7 days of sample receipt.

Hepatitis A IgM

Non-urgent specimens are tested twice-weekly, usually on a Monday & Thursday. Results are usually available within 5 days of sample receipt.

Hepatitis B surface antigen

Non-urgent specimens are tested twice-weekly, usually on a Monday & Thursday. Results are usually available within 5 days of sample receipt.

Hepatitis B Surface antibody

Monitoring of level of immunity achieved by Hepatitis B vaccination. Requests forms should give full details and clearly specify antibody testing to avoid confusion with Hep B antigen testing. Non-urgent specimens are tested twice-weekly, usually on a Monday & Thursday. Results are usually available within 5 days of sample receipt.

Hepatitis C antibody

Non-urgent specimens are tested twice-weekly, usually on a Monday & Thursday. Results are usually available within 5 days of sample receipt.
**HIV Antibodies**

Non-urgent specimens are tested twice-weekly, usually on a Monday & Thursday. Results are usually available within 5 days of sample receipt.

The BGH Laboratory uses a 4th generation combined HIV 1-2 antibody/antigen assay allowing for early detection of most HIV infections. However HIV tests can be negative in the earliest weeks after exposure.

**RA latex**

Result will usually be available within 3 days of sample receipt.

**Rubella**

The test performed in this laboratory is for the detection of IgG antibody and is thus only of use for ante-natal and other screening purposes. Non-urgent specimens are tested twice-weekly, usually on a Monday & Thursday. Results are usually available within 5 days of sample receipt.

Diagnosis of current infection requires a clotted sample which will be referred to the Regional Virus Laboratory for testing for IgM and other markers as appropriate.

**TPIgG ELISA (Syphilis serology)**

Non-urgent specimens are tested twice-weekly, usually on a Monday & Thursday. Results are usually available within 5 days of sample receipt.

**VZV antibody**

This test is for IgG antibodies and gives an indication of past exposure, which should be protective. All samples are tested in a batch, usually on a Tuesday. Results are usually available within 7 days of sample receipt. For advice regarding at risk patients who have been in contact with chickenpox please contact the Consultant Microbiologist.

**REFERRED SEROLOGY**

Brown serum gel tubes are most commonly used for Microbiology serology tests but there are important exceptions (see below). Plain/neutral blood tubes with white lids should not be used for any serology tests. Blood in these tubes does not clot well thus it is often difficult to separate serum from red cells. Full details of the correct tube/specimen are given in the list of tests.

1. CD4/8 counts require 5ml EDTA sample (FBC tube). Please send all of these to Microbiology, on a Microbiology form, and NOT to Haematology.
2. HLA B27 typing, HLA DR & DQ typing and narcolepsy testing require a 10ml EDTA sample, HLA A&B typing requires a 10ml lithium heparin sample, HLA
Antibody Screen/Lymphocytotoxic antibodies requires a brown serum gel tube. All histocompatibility samples MUST be received at the BGH Laboratory before 12 noon on a Thursday, as the reference Laboratory will not process samples on a Friday or weekend.

3. All blood requests for PCR testing e.g. CMV PCR, HIV, Hep C Viral Load testing, Meningococcal, Pneumococcal, Haemophilus PCR (for cases of suspected invasive disease) require an EDTA blood tube. For CMV, HIV & Hepatitis a large 7.5mL EDTA sample should be sent.

**Virology Samples**

Most referred virology samples are referred to the Regional Clinical Virology laboratory in Edinburgh. Results are usually returned within 14 days.

All swabs for viral culture MUST be sent in viral transport medium. Viral swabs are available from the Microbiology Laboratory.

Any fluids should be sent in a plain sterile bottle.

Urine for CMV investigation must be sent “fresh” i.e. taken in the morning and sent immediately to the laboratory.

Requests for virology samples must be accompanied by full clinical details including date of onset of illness. If insufficient details are provided the sample may not be tested. Additionally some samples may not be tested until a second convalescent sample is received.

**Atypical pneumonia screen**

For Influenza A and B, Parainfluenza, RSV, Adenovirus & Mycoplasma respiratory samples (Nose/Throat/Pharyngeal swabs and Nasopharyngeal aspirates) will be tested. These must be sent in viral transport media.

*Chlamyphila spp* e.g. *C. psittaci* & Q Fever requires acute and convalescent sera.

**Chlamydia antibody**

There may be problems with interpretation of antibody results due to cross reactions between chlamydial species. Clinical information should be supplied to help with interpretation, but discussion with the consultant Microbiologist may often be required in addition.

**CMV IgG antibodies**

To diagnose past infection/immunity status e.g. in immunocompromised patients.

**CMV IgM antibodies**

To diagnose acute infection.
**EBV antibodies**

To diagnose both past and acute infection

**Hepatitis A antibody (IgG)**

Usually for foreign travel or immunity status prior to vaccination.

**Mumps**

Virological testing for mumps is only indicated if the clinical diagnosis is uncertain. The preferred sample is an acute parotid duct or throat swab in viral transport media, although an IgM test is available for acute serum samples.

**TORCH screen**

Prenatal sampling for the diagnosis of congenital infections can be performed. This is best done as individual tests, after discussion with the Consultant Microbiologist, as the amount of serum available is usually limited and should not be wasted on tests which are irrelevant or of little value in a particular case.

**Toxoplasma antibodies**

Full clinical details must be provided particularly in cases of contact during pregnancy.

**Viral titres**

The type(s) of viruses to be looked for will be dependent on clinical information provided. Discussion is often useful.

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**IMMUNOLOGY**

Most immunology samples are referred to the Immunology Department at the Scottish National Blood Transfusion Service in Edinburgh.

Results are usually returned within 19 days.

**SNBTS Immunology Handbook**

The following tests are available on a routine request basis. Broad requests of "auto-antibody screen" will be dealt with on the basis of clinical details and results obtained in the various tests performed. Often a request for one test may generate the need to perform others in order to produce a meaningful report. If multiple tests are required please send more than one tube of blood. The Microbiology department is not able to provide clinical Immunology advice. This is available from the Immunology Department (see links to Handbooks).
Tests for the following antigens and antibodies are available:

- ANF
- Double stranded DNA
- Intrinsic factor antibodies
- Thyroid antibodies
- Mitochondrial antibodies
- Microsomal antibodies
- Gastric parietal cell antibodies
- Smooth muscle antibodies
- Cardiolipin antibodies
- Pancreatic islet cell antibodies
- ANCA
- C1 esterase antibodies
- IgE
- RAST please specify to which allergens or possible causes.
- Ro, La, Sm antibodies etc
- Allergens (please specify)
- Glomerular basement antibody
- Muscle receptor antibodies
- HLA typing
- Lymphocytotoxic antibodies

**MISCELLANEOUS REFERRAL**

Results of samples sent to external laboratories are usually returned within 14 days.

**Bordetella antibodies (for whooping cough)**

Only of value retrospectively. It will not assist in the diagnosis of current disease. Pernasal swabs, using the appropriate swab available from the laboratory is the most satisfactory investigation in the acute stage of whooping cough. *Bordetella pertussis* culture is performed at the BGH and takes up to 1 week. Caution is advised in obtaining this sample. If inexperienced in this technique, please telephone the Consultant Microbiologist for instructions.

**Borrelia antibodies (for Lyme disease)**

This test will only give an indication of exposure or past infection with “Lyme disease”. It will not diagnose current or active infection.
Legionella

Tests are available at the reference laboratory for antibody in blood and antigen in urine and respiratory samples. These tests are NOT performed as routine screens. They are useful diagnostic tools in cases of likely disease with good clinical indications, which must be communicated to the laboratory before the specimens will be forwarded to the reference laboratory. Please note that legionella antigen testing requires the urine to be collected into a white top plastic universal.

Leptospiral antibodies

Antibody and antigen test available, though they take several weeks to do, and their value is thus limited.

Mycobacteria

Respiratory samples are referred to the Scottish Mycobacteria Reference Laboratory for culture. Results are usually returned after 8 weeks but may be available sooner for AFB film-positive samples.

Parasitology

The tests listed below are available from the Scottish Parasite Reference Laboratory:

- Amoebic CFT
- Filarial antibodies
- Leishmania
- Schistosomal ELISA

There may be reason to have other tests done elsewhere e.g. Liverpool School of Tropical Medicine, after discussion with the laboratory. Please contact the laboratory to discuss the most suitable specimen and timing for the test you require.

Precipitins

Serum precipitin tests are available for the following

- Aspergillus
- Farmer's lung
- Avian

Widal

This test is of very limited value and may be difficult or impossible to interpret if the patient has had typhoid vaccine in the recent past. Please discuss with Consultant Microbiologist if you think the test may be useful for a patient in your care.
<table>
<thead>
<tr>
<th>Reference Lab Details</th>
<th>Tests Referred</th>
</tr>
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<tbody>
<tr>
<td>Regional Antimicrobial Reference Laboratory</td>
<td>Streptomycin levels</td>
</tr>
<tr>
<td>Department of Microbiology Southmead Hospital</td>
<td>Teicoplanin levels</td>
</tr>
<tr>
<td>Westbury-on –Trym Bristol BS10 5NB</td>
<td>CPA REF NO: 0038</td>
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<tr>
<td>Bacteriology Department Royal Infirmary of Edinburgh 51 Little France Crescent Edinburgh EH16 4SU</td>
<td>Tobramycin levels</td>
</tr>
<tr>
<td>Bristol Regional HPA Laboratory Department of Microbiology Myrtle Road Kingsdown Bristol BS2 8EL</td>
<td>Cryptococcal Antigen</td>
</tr>
<tr>
<td>CPA REF NO: 2496</td>
<td>Antifungal levels - Itraconazole, Voriconazole &amp; Flucytosine</td>
</tr>
<tr>
<td>Scottish E.coli O157 Reference Laboratory Department of Clinical Microbiology Royal Infirmary of Edinburgh 51 Little France Crescent Edinburgh</td>
<td>Psittacosis/Chlamydia psittaci abs</td>
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<tr>
<td>Department of Neurology Glasgow Neuroimmunology Laboratory Southern General Hospital 1345 Govan Road Glasgow G51 4TF</td>
<td>Acetylcholine receptor antibodies</td>
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<td>Anti-neuronal antibody</td>
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<td>CPA REF NO: 2151</td>
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<td>Adrenal antibodies</td>
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<td>Anti neutrophil cytoplasmic antibody</td>
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<td>C1 esterase inhibitor</td>
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<td></td>
<td>Anti-cardiolipin antibodies</td>
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| CPA REF NO: 0684 | Complement Screen  
|                 | Double Stranded DNA  
|                 | Extractable Nuclear Antigen  
|                 | Gastric parietal cell antibodies  
|                 | Glomerular basement membrane antibodies  
|                 | Total IgE  
|                 | Intrinsic Factor  
|                 | Pancreatic Islet cell antibodies  
|                 | Anti-mitochondrial antibodies  
|                 | Gastric parietal cell antibodies  
|                 | Smooth muscle antibody  
|                 | Thyroid peroxidase  
|                 | Aspergillus precipitins  
|                 | Avian precipitins  
|                 | Farmers Lung precipitins  
|                 | Allergen testing  

| SNPBTS  
| Histocompatability & Immunogenetics  
| Royal Infirmary of Edinburgh  
| 51 Little France Crescent  
| Edinburgh  
| EH16 4SU  

| CPA REF NO: 0684 | HLA Typing  
|                 | HLA B27  
|                 | Lymphocytotoxic antibody screen  
|                 | Tissue typing (for e.g. Bone marrow transplant)  

| Laboratory of Healthcare Associated Infection  
| Specialist and Reference Microbiology Division  
| 61 Colindale Avenue  
| London  
| NW9 5HT  

| CPA REF NO: 1834 | Anti-DNASE B (for ?strep/post strep infection)  
|                 | Anti-Staphylolysin  
|                 | ASO Referral (Neg ASO glomerulonephritis)  
|                 | Identification of organisms  

| Virus Reference Department Centre for Infections  
| 61 Colindale Avenue  
| London  
| NW9 5HT  

| CPA REF NO: 2904 | VZV Vaccine Response  

| Streptococcus & Diphtheria Reference Unit Respiratory & Systemic Infection Laboratory  
| 61 Colindale Avenue  
| London  
| NW9 5HT  

| CPA REF NO: 0590 | Diphtheria abs  

| Laboratory of Enteric Pathogens Centre for Infections Health Protection Agency  
| 61 Colindale Avenue  
| London  
| NW9 5EQ  

| CPAB REF NO: 0590 | Widal  
|                 | Yersinia antibodies  

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Author(s): M Caroline Thompson

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| CPA REF NO: 1683 | HiB Vaccine response  
Pneumococcal antibodies (vaccine response)  
Tetanus antibodies |
|------------------|--------------------------------------------------|
| Clinical Immunology Laboratory  
1st Floor Laboratories Building  
Gartnavel General Hospital  
21 Shelley Road  
Glasgow  
G12 0XL | |
| CPA REF NO: 1677 | Legionella culture  
Legionella antibodies  
Legionella antigen |
| Scottish Legionella Reference Laboratory  
Stobhill Hospital  
133 Balornock Road  
Glasgow  
G21 3UW | |
| CPA REF NO: 1949 | Brucella abs |
| Clinical Microbiology and HPA Collaborating Laboratory Brucella Reference Unit (BRU)  
University Hospital Aintree  
Lower Lane  
Liverpool  
L9 7AL | |
| CPA REF NO: 0453 | Hydatid serology |
| Liverpool School of Tropical Medicine and Hygiene  
Pembroke Place  
Liverpool  
L3 5QA | |
| CPA REF NO: Not accredited | Haemophilus Typing (cultures)  
Multiplex PCR (Meningo, Pneumo, HI)  
Meningococcal Typing (cultures)  
Meningococcal antibody (not vaccine response)  
Pneumococcal Typing (cultures) |
| Scottish Meningococcus and Pneumococcus Reference Laboratory SMPRL  
Stobhill Hospital  
Balornock Road  
Glasgow  
G21 3UW | |
| CPA REF NO: 1948 | Leptospira abs |
| Department of Microbiology and Immunology  
County Hospital  
Hereford  
HR1 2ER | |
| CPA REF NO: 1180 | Fungal referral e.g. ID & Sensitivity  
Yeast Sensitivity |
| Department of Clinical Microbiology  
Royal Infirmary of Edinburgh  
51 Little France Crescent  
Edinburgh | |
| CPA REF NO: 2496 | Bordetella serology |
| Microbiology Department Laboratories Directorate  
Wishaw General Hospital  
50 Netherton Street | |
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