GUIDELINES FOR LABORATORY USERS

DEPARTMENT OF MEDICAL MICROBIOLOGY
SOUTHMEAD AND FRENCHAY SITES

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1.0 General Information
The Department of Medical Microbiology provides a hospital-based service, over two sites Southmead Hospital (SMD) and Frenchay Hospital (FHY) for the laboratory diagnosis and clinical management of microbial diseases for patients in both hospital and the community, together with advice on the control of infection.
Both laboratories participate and perform well in National Quality Assurance Programmes and have granted conditional approval by Clinical Laboratory Accreditation-(UK)-Ltd-(CPA). They are accredited for training with the Health Protection Council and the Royal College of Pathologists.
Medical Microbiologists are available, both during the day and out of hours, to give advice concerning the diagnosis, treatment and monitoring of infectious diseases. Where appropriate, preliminary reports and results are phoned to the clinician concerned. Ward rounds are conducted daily to review and offer advice on the management of in-patients with serious infections.
An active Infection Control Team is available at all times to help with matters relating to the control and prevention of infection.
Other related documents available from the department are:
- Guidelines for Empiric Antibiotic Therapy
- Infection Control Manual

1.1 Staff

Medical staff
The Department is staffed by four Consultant Medical Microbiologists, headed by Dr K Jacobson (Head of Department), Prof AP MacGowan, Dr E Darley, Dr I Ibrahim, and five Specialist Registrars.

Technical Staff (BMS and MLA)
Mr Jonathan Turner is the Microbiology Laboratory Manager.
NBT Microbiology is staffed by 44 staff (WTE) (49 total)

Clinical Scientists
There are four Clinical Scientists (based on the Southmead site).

Infection Control
Infection Control advice is provided by the Director of Infection Prevention and Control (DIPC), Consultant Medical Microbiologists and the Infection Control Nurses.

1.2 Services
The Department provides a wide range of tests for the diagnosis of bacterial infections and antimicrobial drug monitoring, and a limited service for fungal infections and parasitology, but including all the more common infections. All GP work is processed on the SMD site. Some specialised mycological, parasitological and virology/serological tests are referred to specialist laboratories, but should be sent via the Department of Medical Microbiology and not directly to reference laboratories, (a full list of accredited referral laboratories are...
available from the SMD laboratory). Within SMD Microbiology Department is the National Antimicrobial Reference Laboratory which provides a national service for antimicrobial drug monitoring and the UK National External Quality Assessment Scheme for antibiotic assays is distributed, managed and analysed from this section. Clinicians who are in doubt as to the range of services offered and their use should consult a Medical Microbiologist. Infection Control Policies are issued separately from these Guidelines and are available on the Trust Intranet Site and in the Infection Control Manual available in all clinical areas.

1.3 Contact numbers and out of hours service

1.3.1 Southmead Hospital (SMD): Telephone 0117 323 5050

SMD Microbiology Routine hours: 09:00hrs – 17:15hrs Monday to Friday (core hours)
17:00hrs – 19:45hrs Monday to Friday (late shift)
09:00hrs – 12:00hrs Saturday
Outside these hours cover is provided by an emergency on-call system

Out-of-hours, emergency medical (including infection control) and technical (BMS) cover is available at all times and may be contacted via the switchboard. It is the responsibility of the requesting doctor to contact the on-call BMS to process urgent specimens outside normal working hours.

SMD General Microbiology enquiries
Internal Ext 35660
External 0117 3235660
Fax 0117 3238513

SMD Medical Microbiologist
(on clinical duties) Ext 32656
Bleep 9446

SMD Late shift BMS (in use 17:00hrs pm – 19:45hrs) Radiopage via switchboard

Microbiology Laboratory Manager:
Mr Jonathan Turner Ext 35658

SMD Medical Microbiologists:
Dr Kim Jacobson Ext 36358
Prof Alasdair MacGowan Ext 35652
1.3.2 **Frenchay Hospital (FHY):** Telephone 0117 3401212

FHY Microbiology Routine hours are:
- 09:00hrs - 17.15hrs Monday to Friday
- 09:00hrs - 12.00hrs Saturday

Outside these hours cover is provided by an **emergency on-call system**

Out-of-hours, emergency medical (including infection control) and technical (BMS) cover is available at all times and may be contacted via the switchboard. It is the responsibility of the requesting doctor to contact the on-call BMS to process urgent specimens outside normal working hours.

FHY General results enquiries
- Internal: Ext 03975
- External: 0117 3403975

FHY General Microbiology enquiries
- Internal: Ex. 03813
- External: 0117 3403813
1.4 *Urgent requests and additional investigations*
Urgent specimens taken between 09.00 and 17.00 should be notified to the laboratory by telephone (see numbers above). Outside these hours please contact on-call Microbiologist, and BMS on-call via radio page via switchboard.
Samples requiring additional investigations will be considered on a case-by-case basis depending upon specimen type and investigation requested. Please contact the laboratory to discuss.

1.5 *Completion of Request form*
To enable Pathology to:
- Identify the correct patient.
- Perform the correct test/procedure.
- Produce accurate reports that can be appropriately delivered.

It is vital that request forms are fully and correctly completed, or submitted via ICE if available.

Detailed below is the standard to which all request forms must be completed.
All writing must be legible and in ballpoint pen so as to be readable. Where addressograph labels are used, please ensure that the current Consultant and Location of the patient are added.

**PATIENT IDENTIFICATION**

1. Hospital Registration Number or NHS number
2. Surname.
3. Forename.
4. Date of Birth.

Failure to provide any of these mandatory requirements may result in the required analyses not being performed.

**OTHER ESSENTIAL INFORMATION**

5. Patient Gender.
6. Consultant. (using Trust agreed standard abbreviation) / General Practitioner
7. Location.
8. Tests Required.
9. Date and Time Sample Taken
10. Relevant Clinical Details/Drug Therapies.
11. History of foreign travel, and country.

1.5.1 **ICE (Electronic requesting)** should be used wherever possible.

1.6 **Labelling of Pathology Specimens**

All specimens must be clearly labelled with:

- Patient's full name (**Surname and Forename**).
- Hospital Registration Number / NHS number and date of birth.
- Date and time collected.
- Specimen type and site.

Failure to comply with these guidelines may lead to the rejection of the sample. Specimens should be placed in appropriate containers (see below) and it is especially important that those containing pus, fluids or blood should be shut tight as leakage in transit may result in the sample being discarded or may make analysis difficult or invalid and pose an obvious hazard to others.

**1.7 Pathology Supplies**
In Patients
Supplies of Request Forms and Specimen Containers are available from Pathology Consumables.

GP’s and Other Clinics
A proforma list of Pathology Supplies available can be sent (or faxed) to Pathology Consumables and your requirements will be dispatched via the Hospital Transport System within 3 working days. Emergency arrangements can be made by contacting Pathology Consumables. Please ensure the forms clearly indicate where you wish the supplies to be delivered and please ensure you do not overstock as some of the specimen containers have expiry dates of less than 6 months.

If you do have stock which is in danger of becoming outdated, please return it whilst it is still in date.

1.8 Transport Requirements
Surgeries to place specimens in an individual specimen container inside a sealed specimen bag with a request form in attached pocket.

This should then be placed in a large sealable specimen bag along with other specimens destined for the same pathology laboratory with sufficient tissue to absorb the contents to be held in a secure area of the premises until collection by the driver.

The driver will transport specimens from the surgery to the van and place the bag of specimens in the appropriate plastic box fitted in the van, securing the lid. The plastic boxes in the van will be padded with cushioning and absorbent material and be labelled appropriately with the transport mark.

The driver will then carry the boxes to the appropriate pathology reception where they will be emptied, and take the empty transport boxes back to the van.

In the event of an accident or spillage away from the trust follow instructions with the spill kit on each van. Information can be obtained from Microbiology at SMD 0117 32 35660 or FHY 0117 34 03813 out of hours via the on call microbiology BMS via switchboard 0117 9701212.

1.9 Results
For all microbiology tests done on site results will be available by the use of ward based or GP surgery computers via VPLS. All virology results are available via the VPLS.

If results are not available by computer then they may be obtained on:

SMD ext 32655 or direct dial 0117 32 35660
FHY ext 03813 or direct dial 0117 34 03813.

The Department expects that users interrogate the computer files as a first-line for enquiries.
Certain results are routinely communicated to the clinician by telephone, fax or in person by a medical microbiologist. These include isolates of haemolytic streptococcus Group A, isolates of importance to infection control, enteric pathogens such as *Salmonella*, *Shigella* or *Campylobacter*, *Cryptosporidia* and Mycobacteria, all blood culture and CSF isolates and antimicrobial assay results.

Clinicians having specific concerns about patients who may have infections are encouraged to contact the Department to obtain advice about their investigation and further management. Early consultation about patients with severe infection may result in more rapid analysis of specimens with results being available more quickly to the clinician as well as providing direction on antimicrobial and other management. Similarly those in doubt about appropriate infection control procedures are encouraged to contact either an infection control nurse or medical microbiologist. (See Infection Control Manual).

### 2.0 Specimen collection

The advice on the collection of specific common specimens is not intended to be exhaustive, so any doubts about specimen collection, or transport should be directed to the laboratories:

- SMD ext 32655
- FHY ext 03795

Some patients who are infected or colonised with certain infectious agents require special precautions when taking specimens and for their transport, see Infection Control Manual.

**General Principles**

Specimens should be transported to the laboratory as promptly as possible.

Specimens, particularly blood, should be obtained in strict accordance with guidelines to prevent needlestick injuries.

Specimens should be collected using strict aseptic technique in order to minimise contamination by indigenous flora, and using sample containers supplied by NBT.

Inappropriate specimens include the following:

- sinus tract specimens from patients with suspected osteomyelitis
- surface swabs from diabetic or decubitus ulcers that do not look infected
- routine catheter specimens of urine i.e. in the absence of signs or symptoms of infection
- nasal swabs from patients with suspected sinusitis
- high vaginal swabs from patients with suspected pelvic inflammatory disease, but with no vaginal discharge or other evidence of infection on examination
- Urine catheter tips

Sufficient material should be provided for culture and all of the other tests required.

Whenever possible, tissue, fluid or pus, as opposed to swabs, should be provided.
Other specimens that are unsuitable for microbiological examination include the following:

- unlabelled or improperly labelled specimens
- specimens received in leaking, cracked or broken containers
- specimens received in containers, the external aspects of which are contaminated
- unpreserved specimens received more than 12 hours after being collected

Provide a separate request form for each specimen.
All investigations must be authorised.

Specimens should be transported in sterile containers. If transport is to be significantly delayed, a suitable transport medium/device should be used or the specimen refrigerated in order to optimise testing; specimens that should not be refrigerated include blood cultures, CSF and those that might contain *Neisseria* spp. or *Haemophilus influenzae*.

Specimens should be transported in a manner that ensures that the containers are not damaged, resulting in contamination or leakage, in accordance with section 1.9. This applies particularly to glass containers, especially when they are transported by the pneumatic tube system.

If a specimen is to be processed urgently, the requesting clinician must contact the laboratory, stating the type of specimen, the name and source of the patient and the number to which the result is to be telephoned.

Out-of-hours investigations can be arranged by contacting the on-call BMS via the switchboard operator. Specimens received out of hours, which have not been identified to the on-call BMS, will not be processed until the next working day.

**Quick guide:**

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<th>TURN AROUND</th>
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<td>Serum</td>
<td></td>
<td>Serum gel (brown top)</td>
<td>Microbiology</td>
<td>&lt;1 day</td>
<td>Gentamicin pre-dose levels should be measured before the 2nd dose, if on once daily dosing. Vancomycin pre-dose levels should be measured before the 3rd or 4th dose. Pre-dose levels should be taken immediately before the dose is due. If a Post dose level is indicated this should be taken 1 hour after the dose is given. For further information please refer to the Antibiotic Guidelines.</td>
</tr>
<tr>
<td>BAL for MCS (BAL)</td>
<td>BAL</td>
<td></td>
<td>White top universal</td>
<td>Microbiology</td>
<td>&lt;6 days</td>
<td>Please request TB culture, PCP, or virology if required.</td>
</tr>
<tr>
<td>Blood for MCS</td>
<td>Blood</td>
<td></td>
<td>Blood culture</td>
<td>Microbiology</td>
<td>&lt;6 days</td>
<td>2 sets of cultures at separate times from separate sites should</td>
</tr>
<tr>
<td>Specimen Type</td>
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<tr>
<td>Faeces for C. difficile toxin testing (CDI)</td>
<td>Faeces</td>
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<tr>
<td>Blood for TB (TB)</td>
<td>Blood</td>
<td>5-10ml</td>
<td>Blood for MCS (TIS)</td>
<td>Bone</td>
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<td>Bone for MCS (TIS)</td>
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<tr>
<td>Chlamydia/GC swabs (HPA)</td>
<td>HVS/LVS/CX/End</td>
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<td>CSF for MCS (CSF)</td>
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<td>Ear swab for MCS (EAR)</td>
<td>Ear / left / right</td>
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<td>Faeces for OCP only (OCP)</td>
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<tr>
<td>Faeces for OCP only (OCP)</td>
<td>Faeces</td>
<td>&lt;3 days</td>
<td>Faeces for OCP only (OCP)</td>
<td>Faeces</td>
<td>&lt;3 days</td>
<td>Faeces for OCP only (OCP)</td>
</tr>
</tbody>
</table>

Please indicate duration of symptoms, any history of foreign travel, use of antibiotics, suspected food poisoning, and whether diarrhoea is community- or hospital-acquired. Patients who develop diarrhoea after being in hospital for >3 days will normally be tested for Clostridium difficile toxin only. Formed stool specimens will not be processed. Minimum volume: 2 spatula-sized portions.
<table>
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<tr>
<th>Sample Type</th>
<th>Collection Kit</th>
<th>Requesting Information</th>
<th>Microbiology</th>
<th>Time Frame</th>
<th>Notes</th>
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<tbody>
<tr>
<td>Female/male swabs for chlam/GC (HPA)</td>
<td>HVS/LVS/Cx/End/Ure/Penile</td>
<td>NAAT tube</td>
<td>Microbiology</td>
<td>&lt;10 days</td>
<td>For diagnosis of candidiasis, Trichomonas vaginalis, and bacterial infection (including gonorrhoea). Cx/Endocervical swabs should be taken for STI investigations. For Chlamydia please use NAAT kits.</td>
</tr>
<tr>
<td>Female Genital swabs for MCS (FGP)</td>
<td>HVS/LVS/Cx/End/Vag</td>
<td>Amies charcoal swab</td>
<td>Microbiology</td>
<td>&lt;4 days</td>
<td>For Chlamydia please use NAAT kits.</td>
</tr>
<tr>
<td>Fluids for MCS (FLD)</td>
<td>Fluid</td>
<td>White top universal</td>
<td>Microbiology</td>
<td>&lt;4 days</td>
<td>Microscopy for crystals performed by Histology - please use separate request. Please request TB culture if required.</td>
</tr>
<tr>
<td>Hair for Mycology (MYC)</td>
<td>Hair</td>
<td>Mycology collection kit</td>
<td>Microbiology</td>
<td>&lt;15 days</td>
<td>The hair follicle and 1” of proximal hair should be sent. Please request kit from the laboratory.</td>
</tr>
<tr>
<td>Penile swab for MCS (PEN)</td>
<td>Penile</td>
<td>Amies charcoal swab</td>
<td>Microbiology</td>
<td>&lt;3 days</td>
<td>Use Urethral swab for STD screen.</td>
</tr>
<tr>
<td>Mouth swab for MCS (MO)</td>
<td>Mouth</td>
<td>Amies charcoal swab</td>
<td>Microbiology</td>
<td>&lt;3 days</td>
<td></td>
</tr>
<tr>
<td>Infection Screen Pre-elective (non implant) (XIN)</td>
<td>MRSA/MRC/scree n</td>
<td>Amies charcoal swab/Boricon universal / Sputum pot</td>
<td>Microbiology</td>
<td>&lt;3 days</td>
<td>MRC screening – Frenchay only (burns patients)</td>
</tr>
<tr>
<td>Infection Screen Hospital InPt/elective implant (XIN)</td>
<td>MRSA/MRC screen</td>
<td>Amies charcoal swab/Boricon universal / Sputum pot</td>
<td>Microbiology</td>
<td>&lt;3 days</td>
<td>MRC screening – Frenchay only (burns patients)</td>
</tr>
<tr>
<td>Infection Screen Renal (XIN)</td>
<td>MSSA/MRC/ screen</td>
<td>Amies charcoal swab/Boricon universal / Sputum pot</td>
<td>Microbiology</td>
<td>&lt;3 days</td>
<td>MRC screening – Frenchay only (burns patients)</td>
</tr>
<tr>
<td>Nail clippings for Mycology (MYC)</td>
<td>Nail</td>
<td>Mycology collection kit</td>
<td>Microbiology</td>
<td>&lt;15 days</td>
<td>Several small parings are preferred to one large sample. Please request kit from the laboratory.</td>
</tr>
<tr>
<td>Nose swab for MCS (NOS)</td>
<td>Nose</td>
<td>Amies charcoal swab</td>
<td>Microbiology</td>
<td>&lt;3 days</td>
<td>Use Infection Screen request for MRSA, MSSA (Renal), MRC (Frenchay only).</td>
</tr>
<tr>
<td>Pus for MCS (PUS)</td>
<td>Pus</td>
<td>White top universal</td>
<td>Microbiology</td>
<td>&lt;7 days</td>
<td>Please request TB culture if required.</td>
</tr>
<tr>
<td>Virology/ Serology (HPA/REF)</td>
<td>Serum/ all samples</td>
<td>Serum gel (brown top) / EDTA/Faeces/ Urine</td>
<td>Microbiology</td>
<td>&lt;10 days</td>
<td>Results for Virology / Serology see VPLS. EDTA samples are required for all PCR tests.</td>
</tr>
<tr>
<td>Skin scrapings Mycology (MYC)</td>
<td>Skin</td>
<td>Mycology collection kit</td>
<td>Microbiology</td>
<td>&lt;15 days</td>
<td>Collect material from lesion with blunt scalpel blade - the edge is most likely to contain viable fungus. Please request kit from the laboratory.</td>
</tr>
<tr>
<td>Skin swab for MCS (SKS)</td>
<td>Skin swab - state site</td>
<td>Amies charcoal swab</td>
<td>Microbiology</td>
<td>&lt; 5 days</td>
<td>Use for MCS for superficial sites. For deeper sites please use Wound for MCS.</td>
</tr>
<tr>
<td>Sputum for MCS (SP)</td>
<td>Sputum</td>
<td>White top universal with</td>
<td>Microbiology</td>
<td>&lt; 4 days</td>
<td>Do not send specimens obtained after antibiotic therapy has been initiated or specimens which are largely salivary.</td>
</tr>
</tbody>
</table>
## Microbiology User Guide

### 2.1 Urine

Urine catheter tips will not be processed. There is no such thing as a routine MSU or CSU. Specimens should be sent only on clinical grounds. Sensitivities on isolates from CSUs will be withheld unless there is clinical information to suggest that the patient is actively infected, i.e. pyrexia, septicaemia, etc. If the specimen cannot be sent immediately to the laboratory, refrigerate until transport is available. In the absence of pyuria, investigations to exclude TB will not usually be undertaken. Early Morning Urine collection kits for TB are supplied by the laboratory on request.

### 2.1.1 Mid Stream Urines (MSUs)

The aim is to collect urine from the patient with minimal contamination. All patients require clear instructions and some may need assistance, in which case hands should be washed and non-sterile gloves may be required. If possible a urine sample should be obtained following a bath/shower; if this is not possible the external genitalia should be washed with soap and water and the first part of

<table>
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<tr>
<td>Throat swab for MCS (T)</td>
<td>Amies charcoal swab</td>
<td>Microbiology</td>
<td>&lt;3 days</td>
</tr>
<tr>
<td>Tip for MCS (TIP)</td>
<td>White top universal</td>
<td>Microbiology</td>
<td>&lt;3 days</td>
</tr>
<tr>
<td>Tissues for MCS (TIS)</td>
<td>White top universal</td>
<td>Microbiology</td>
<td>&lt;7 days</td>
</tr>
<tr>
<td>Trachael aspirate for MCS (TRA)</td>
<td>White top universal</td>
<td>Microbiology</td>
<td>&lt;4 days</td>
</tr>
<tr>
<td>Urethral swab for MCS (URE)</td>
<td>Amies charcoal swab</td>
<td>Microbiology</td>
<td>&lt;3 days</td>
</tr>
<tr>
<td>Urine for Legionella (LEG)</td>
<td>Boricon universal / white top universal</td>
<td>Microbiology</td>
<td>&lt;2 days</td>
</tr>
<tr>
<td>Urine for MCS (U)</td>
<td>Boricon universal</td>
<td>Microbiology</td>
<td>&lt;3 days</td>
</tr>
<tr>
<td>Urine for TB (TB)</td>
<td>3x 250ml containers (TB collection kit)</td>
<td>Microbiology</td>
<td>63 days</td>
</tr>
<tr>
<td>Wounds swab for MCS (WOU)</td>
<td>Amies charcoal swab</td>
<td>Microbiology</td>
<td>&lt;3 days</td>
</tr>
</tbody>
</table>

Please request TB or fungal culture if required.
the urine stream passed into the toilet or bedpan. Without stopping the stream the specimen is collected in a sterile or clinically clean utensil i.e., foil bowl or specimen container by intercepting the stream. If the specimen is collected in a foil bowl and greater than 20ml transfer to a sterile urine container containing boric acid. If less than 20ml please use a white top container. Ensure it is correctly labelled. Ensure the request form is filled out correctly and placed with the specimen in a plastic transport bag alternatively the test can be ordered via the Electronic Patient Record system (ICE). If there is likely to be a delay in collection the specimen should be refrigerated (not in the food or drugs refrigerator). Hands MUST be washed following collection of the urine sample.

2.1.2 Catheter Specimens Urines (CSU)
Try to collect the specimen within 1 hr of specimen transport to the laboratory. The specimen should not be collected from the drainage bag, only from the sampling port. Clamp off the drainage tube immediately below the sampling port and leave for several minutes to allow enough urine to collect for sampling. Label the specimen pot, wash hands and swab the sampling port with an alcohol-impregnated swab. Using a needle and syringe insert the needle through the latex or plastic port and withdraw 10ml of urine. Transfer the urine to a sterile container containing boric acid. Discard the syringe and needle in a sharps container and unclamp the catheter tubing. Wash your hands and place the specimen and request form in a transport bag. If the specimen is not to be transported within one hour it must be refrigerated.

2.2 Collection of high vaginal and cervical swabs
Explain the procedure to the patient and help her to achieve a dorsal position, exposing the external genitalia. Hands should be washed and non-sterile disposable gloves worn. Gently insert the speculum into the vagina in a backward and downward direction. Direct a light down the shaft of the speculum to visualise the cervix prior to taking a cervical swab. Remove the swab from the plastic envelope and insert into the vagina. Swab any visible discharge. Remove the swab and place in the transport medium. Remove the speculum and make the patient comfortable.
Label the swabs and ensure the request form is adequately filled out.
Routine bacteriology swabs (charcoal) are used for the diagnosis of candidiasis, *Trichomonas vaginalis* and bacterial infection, including gonococcus, while special swabs are required to test for the presence of chlamydia. Chlamydia NAATS kits may be obtained from the Pathology Office.

In the event of rape or sexual abuse, specimens should not be obtained until the case has been discussed with a senior medical microbiologist in order that a formal chain of evidence can be established.

In the investigation of patients with lower abdominal pain who might have pelvic inflammatory disease, do not routinely swab a vagina from which there is no discharge or which appears normal on examination. In this case an endocervical swab should be submitted for Chlamydia using NAATS kit.

There is no need to submit for culture an HVS or IUCD from a patient in whom actinomyces-like organisms have been seen on a cervical smear; these are constituents of the normal flora of the vagina.
2.3 Faeces

The microbiological examination of faeces is complex and requires a full clinical history including the possibility of food poisoning, foreign travel with the countries visited and the dates, and antimicrobial therapy, as well as the more basic information. Failure to give this information may mean important pathogens are not isolated.

The procedure for specimen collection should be explained to the patient. When the patient has defecated in a bedpan or nappy wash your hands and put on disposable non-sterile gloves. Obtain a specimen of faeces with the spatula supplied. Two spatula-sized portions are all that is required for analysis and containers should not be filled more, unless the faeces is liquid when the pot should be filled to one-third full. If there is going to be a delay in transport of more than 3-4 hours the specimen should be refrigerated.

Label the pot and request form. Details on the request form should include the duration of symptoms and relevant information, such as foreign travel, use of antibiotics, contacts, suspected food poisoning and whether the diarrhoea is community or hospital-acquired. If the diarrhoea is community-acquired, the specimen will be routinely investigated for Salmonella, Shigella, Campylobacter, E.coli O157 and parasites. For hospital-acquired episodes i.e., in patients who develop diarrhoea after being in hospital for more than 3 days, only Clostridium difficile will be routinely excluded.

If there are multiple cases of diarrhoea and/or vomiting on a ward, a member of the Infection Control Team should be informed as soon as possible.

Formed stool specimens will not be processed unless by special arrangement.

All diarrhoeal specimens from patients over 60yrs will routinely have a Clostridium difficile toxin test performed. Specimens from patients who have been in hospital for more than 3 days will only receive a C.difficile toxin test.

“Saline wash” specimens are used in the diagnosis of threadworm. A kit and instructions on its use are obtainable from Microbiology.

2.4 Sputum

The aim is to collect deep respiratory secretions without contamination by upper respiratory tract bacteria. Explain the procedure to the patient and encourage them to breathe deeply and on exhalation cough to produce sputum directly into the sterile specimen container. Specimens obtained after antibiotic therapy has been initiated are of little value and may even yield misleading results. They should not therefore be submitted for microbiological examination.

Specimens should be taken properly, ideally with the aid of a physiotherapist, and should be placed in white universal containers. Specimens which macroscopically prove to be largely saliva or mucoid specimens yield no useful information and will not be cultured.

Label the specimen and the request form (or EPR – ICE request). If the sputum is copious and purulent the patient may require a mouthwash after collection of the specimen.

If sputum is required for mycobacterial (TB) and fungal investigations, three specimens should be sent on three different days and sent to the laboratory on the day of collection i.e. not batched.
For patients suspected of having community-acquired pneumonia blood cultures are essential

Please send separate sample and form to Cytology if cytology is requested.

2.5 Blood Specimens
Prior to obtaining a blood sample from any patient it is advised that hands are washed thoroughly and a pair of non-sterile gloves worn.

2.5.1 Collection of Blood Cultures from NBT Blood Culture Policy CG57

Objective
Each year over 13,500 sets of blood cultures are taken within North Bristol NHS Trust. Taking blood for culture is an important procedure. Blood cultures are used to detect the cause of an infection leading to bacteraemia. The results are important because they help guide appropriate treatment. Micro-organisms are present on the skin surface of patients, staff and the immediate patient environment which can result in contamination of blood cultures. Contamination can cause confusion and potentially, inappropriate treatment because it is sometimes difficult to determine if a positive blood culture is due to genuine bacteraemia or if it is a false positive result caused by contamination. Contaminated blood cultures also affect mandatory surveillance data. This can affect the Trust’s targets, such as the achievement of reductions in MRSA bacteraemia. It is important to take blood cultures correctly in order to minimise the risk of contamination occurring.

The ‘Saving Lives’ programme to reduce healthcare-associated infections includes guidance on taking blood cultures.

Aim
Blood culture to detect bacteraemia is an important investigation with major implications for the diagnosis of patients with infection and the selection of appropriate treatment. This strategy presents recommendations which, if implemented, will improve the quality and clinical value of blood culture investigations and reduce the incidence of sample contamination and ‘false positive’ readings when taking blood cultures.

These recommendations aim to ensure that blood cultures are taken:

- Only when there is an appropriate indication.
- At the correct time.
- Using correct technique in order to prevent contamination of the sample.
- Minimizing risk to patients or staff
- Ensuring correct documentation

Context
Contamination leading to false positive result is defined as growth of bacteria in the blood culture bottle that were not present in the patient’s bloodstream and were introduced during sample collection. This contamination can came from a number of sources:
The patient’s skin
The equipment used to take the sample and transfer it to the culture bottle
The hands of the person taking the blood sample
The general environment

**Recommendations**

Blood cultures should only be taken when there is a reason to suspect infection. They should not be taken for routine assessment. Reasons to suspect an infection and to consider taking blood cultures include but are not limited to:

- The core temperature is outside of the normal range - less than 36°C and more than 37.6°C.
- Tachycardia - HR ≥ 90
- Breathlessness or tachypnoea - ≥ 20
- Chills or rigors.
- Development of unexplained confusion.
- There are focal signs of infection.
- The white blood cell count is outside of the normal range.

**Additional Paediatric Indications**

- Toxic appearance including lethargy
- Decreased Glasgow coma scale
- Increase capillary refill time
- Increased pulse and respiratory rates
- Thrombocytopenia in neonates

Not all patients with some of the above symptoms will require blood cultures (e.g. low grade fever within 24 hours of surgery is not very specific for bacteraemia). Conversely this list is not exclusive and blood cultures will be required in some patients who do not have any of the above symptoms. **In the very young immunocompromised and the elderly signs of infection may be absent or minimal.** Clinical judgement is required to decide when there is a reasonable possibility that a patient has an infection where blood cultures may be useful.

Blood cultures must be taken using a new venepuncture site.

**Blood cultures must not be taken from existing central or peripheral venous cannula.** The only exception to this is if it is believed that a central line may be the source of bacteraemia. It is then appropriate to take blood from both the central line and from the peripheral vein. The peripheral vein sample should be collected first.

Repeated opening and accessing of a central line has a high risk of introducing infection to the patient. The is also a higher contamination rate, and a positive culture from a line may not represent true bloodstream infection, but line colonisation.
Blood cultures must only be taken from a central Line if blood cannot be obtained from a peripheral vein or when a line sepsis is suspected.

Individuals taking blood cultures from central line must follow Trust policy, local guidelines and or care bundles for accessing the line and must be a competent practitioner with this procedure.

Blood cultures should not be taken from veins which are immediately proximal to existing venous cannula. Blood cultures should not be taken from the femoral vein as it is very difficult to disinfect the skin adequately, so there is a high risk of contamination.

The person taking the blood culture must wash their hands before contact with the patient.

Soap and water or a detergent wipe should be used to clean the patient’s skin if it is visibly dirty.

The vein should be palpated to determine the site for taking blood from and a disposable tourniquet applied.

A swab impregnated with 2% chlorhexidine in 70% isopropyl alcohol must be used to disinfect the patient’s skin and allowed to dry. If the patient has intolerance to chlorhexidine. Povidone Iodine 10% must be used as an alternative if the patient is sensitive to Chlorhexidine.

Blood can be collected using a winged blood collection method

Immediately before collecting the sample the cover of the culture bottle cap should be removed and the top should be disinfected with 2% chlorhexidine in 70% isopropyl alcohol and allowed to dry.

The person taking blood must then wash and dry their hands again and put on non-sterile gloves. The site of venepuncture must not be palpated again (even with gloved hands) because this will increase the risk of sample contamination.

The blood should be collected and then the tourniquet should be released. The winged blood collection system must be discarded in a sharps container at the point of use.

Blood collection adapter caps must only be used for taking blood cultures if using a winged blood collection set. This is because it is not possible to judge the amount of blood inoculated unless the bottle can be held vertically and there is the potential for backflow of blood culture media into the patient’s veins.

The volume of blood inoculated should not be less than the amount specified on the blood culture bottle. This will usually be 5ml (except for paediatric bottles). Inoculating less blood than this increases the risk of false negative results. If blood is also being taken for other tests (e.g. biochemistry and haematology), the blood culture bottle must be filled before the other bottles to reduce the risk of contamination. The correct procedure for taking blood cultures is detailed in appendices 2 and 3.
Veins are sometimes difficult to palpate or see when patients are 'shut-down', or oedematous. Each cannulation will need a new butterfly (a smaller gauge needle may be required); the set device holder device can be reuse. Palpate carefully and once vein is located clean the skin again with 2% chlorhexidine and etc & wait 30 seconds to dry.
Taking Blood Cultures

a summary of best practice

"Blood culture, to detect bacteremia, is an important investigation with major implications for the diagnosis of patients with infection and the selection of appropriate treatment. This advice, if followed, will improve the quality and clinical value of blood culture investigations and reduce incidence of sample contamination. This will help improve patient care and contribute towards reducing the number of wrongly reported MRSA infections."

Taking blood culture: Saving lives, reducing infection, delivering safer care. Department of Health 2007

1) Prepare blood collection kit
   - Gather all materials before beginning the procedure. Ensure the blood culture bottles are within date and the screw is blue instead of yellow. Discard bottles with a yellow screw.

4) Wash hands, wear gloves
   - Wash hands again or apply hand rub and apply clean examination gloves. Sterile gloves are not necessary.

7) What not to do
   - The use of blood collection adapters without blood collection tubes is not recommended.

2) Prepare bottles for inoculation
   - Wash hands with soap and water then dry. Remove the plastic slip cap from blood culture bottles and disinfant the septum using a swab dip and alcohol. Apply an infant cap to the bottle. Aseptically open the bottle in order to fully disinfect.

5) Veneupuncture
   - Attach a diaphanous blood collection set to a collection bottle cap. To prevent contaminating the puncture site do not grip the needle until the needle is inserted into the prepared site.

8) Other blood tests
   - If blood is being collected for other tests place an inert into the adapter cap. The inert is used to isolate blood collection tubes onto the needle. If sterile gloves were used, always collect the blood in this time.

3) Prepare venepuncture site
   - Confirm the patient's identity. If skin is visibly soiled clean with soap and water. Apply a disposable tourniquet. Prepare to identify the vein and sterile using 70% alcohol. The venepuncture site is not a sterile site and the sterile caps must be fully removed.

6) Culture bottle inoculation
   - Raise the adapter cap over the sample bottle and press down to push the septum. Hold the bottle upright and tilt the graduated lines to calculate gauge sample volume. Add up to 10 ml of blood per adapter bottle and up to 20 ml of blood to quadruple bottle. Once the adapter cap has been removed remove the adapter cap. Repeat the procedure for the anaerobic bottle.

9) Finish the procedure
   - Discard the diaphanous collection set into a waste extensible and cover the puncture site with an appropriate dressing. Remove gloves and wash hands before recording the procedure according to laboratory policy. For culture, site, site of venepuncture, and any complications. Ensure additional tubes do not cover the bottle barcode and that the year off barcode labels are not removed.
Sending blood cultures to the laboratory
Mix the bottles ensuring they are correctly labelled; differentiate sets by labelling A&B, peripheral or central etc. It is important that the addressograph label / ICE label is not stuck to the bottles in a manner that obscures the barcode or overlaps the bottom rim and that bottles are transported to the laboratory in plastic transport bags provided. If this is not possible they should be kept at room temperature. Do NOT refrigerate.

2.5.2 Collection of blood for Serology
Venous blood is preferable; heel pricks from neonates are adequate. If the volume of blood obtained is small then the laboratory should be asked the minimum amount of blood required for any test.
Blood should be collected as aseptically as possible, patients who have certain contagious infections may require additional precautions, e.g. Biohazard labelling (see Infection Control Manual).

Obtain an adequate volume of blood for the number of tests required.
Samples should be placed in serum gel for clotted blood.
Relevant clinical information, including the date of onset of symptoms, must be provided on the request form.

Specimens should be transported promptly to the laboratory or refrigerated if a significant delay is expected to occur.

For some tests a second (convalescent phase) specimen to demonstrate a rising titre is essential for accurate interpretation of the results and should be taken 10-14 days after the first (acute phase).
Specimens for HIV testing must not be taken without the consent of the patient and only after counselling. Patient details and reasons for testing should be provided on the special HIV form obtainable from Pathology reception. Investigations will NOT be performed unless samples are accompanied by these special forms.

2.5.3 Antibiotic Assays (See Antibiotic Assay Service User Guide)
The following antibiotics are assayed routinely: - gentamicin, tobramycin, amikacin, vancomycin and teicoplanin. It is essential to state whether the assay is a pre or post dose or random sample.
Other antimicrobial agents may be assayed after discussion with the Medical Microbiologist.
Please make every effort to ensure that specimens for antibiotic assay are received in the laboratory in time for the routine processing runs.
Samples of blood for levels must never be taken from the line through which the drug is being given.
Monitoring will be undertaken on weekends and bank holidays only if prior arrangements have been made with the laboratory.

Dosing & frequency
Interpretation of the levels will be provided by a Medical Microbiologist.

All antibiotic assays are processed on the SMD site:
Batch processed daily am and pm.
After 8pm requests will be referred to the on-call Microbiologist
At weekends requests will be processed between 11am -12pm and 5pm -6pm.

Any assay that is required outside these times must be requested by telephone to the on-call BMS and may be referred to the Medical Microbiologist.

2.6 Swabs
Where pus/fluid is available, this should be sent as opposed to a swab.
Swabs should be placed in TRANSPORT MEDIUM, with the cap firmly in place. It is important to state the site from which the specimen was taken to ensure optimal processing and to specify the clinical evidence on which a diagnosis of infection is based. Ensure the swab and request form are labelled as the specimen policy.

2.6.1 Nose Swabs - to detect Staphylococcus aureus
Moisten the swab in sterile saline and then rub the swab against the anterior nares rotating the swab as this is done. Place in the transport media ensuring the specimen is labelled and the appropriate details are given on the request form. Ensure the swab and request form are labelled as the specimen policy.

2.6.2 Throat Swabs - to detect haemolytic streptococci
Take a cotton wool swab and depress the tongue with a spatula. Direct the swab to the back of the throat with the other hand and swab the tonsillar area on both sides rotating the swab as this is done. Place the swab in transport media. Ensure the specimen is labelled and the appropriate details are given on the request form. Ensure the swab and request form are labelled as the specimen policy.

2.6.3 Ear Swabs
Please specify whether the specimen is obtained from a patient with otitis externa or media.
A swab of the infected area, obtained before antibiotics are initiated, should be sent to the laboratory in transport medium. Ensure the swab and request form are labelled as the specimen policy.

2.6.4 Eye Swabs
Conjunctiva swabs should be collected in transport medium.
Swabs for chlamydia investigations are available from the Laboratory. Ensure the swab and request form are labelled as the specimen policy.

2.7 Wound Swabs
Where pus/fluid is available, this should be sent as opposed to a swab
Wound swabs should only be taken if there is clinical evidence of infection, unless there is an infection control reason. A wound swab should be obtained before the wound is cleaned, patient bathed or antibiotics commenced or changed, and it should be taken directly
from an infected site avoiding contaminating undamaged skin or mucous membranes. Rotate the swab in pus or exudate and place it in the transport media.
Ensure the swab and request form are labelled as the specimen policy. The site of the wound and the clinical features that suggest that it is infected should be stated clearly.

2.7.1 Leg ulcers
Do not send swabs unless there is evidence of infection, even if the ulcer if failing to heal. Take the swab from beneath the margin of the ulcer; a foul odour is consistent with the presence of anaerobes. Ensure the swab and request form are labelled as the specimen policy

2.8 Collection of Intravascular line tips

Line-related infections
Do not send intravascular line tips on removal of the line if there are no clinical reasons to suspect that the patient is septic. For suspected line-related infections, send two sets of blood cultures, one from the line itself and one from a peripheral vein, as well as the tip. The skin in the region of the intravascular catheter should be cleaned with alcohol and the catheter withdrawn with sterile forceps according to Trust Policy. The terminal 5cm of the catheter tip should be cut off with sterile scissors and placed in a dry sterile container to transport to the laboratory. Label the container and place it and the request form in a transport bag for collection. If line has been used for Total Parenteral Nutrition this should be noted on request form. Ensure the container and request form are labelled as the specimen policy

2.9 Samples for the diagnosis of superficial fungal infections

Mycology
Cutaneous scalp lesions and nails should be cleaned with 70% alcohol prior to sampling, particularly if ointments, creams or powders have been applied to the lesion. Specimens of skin, hair, nails and vesicle crusts should be sent to the laboratory in Mycology kits provided Sputum samples should be sent in plain sterile universal containers. Clinical information MUST include contact with animals, occupation and recent travel abroad. Ensure the container and request form are labelled as the specimen policy

2.9.1 Nail Clippings
Several small parings are preferred to one large sample in order to optimise culture results. Nail parings should be taken from diseased area, the discoloured or brittle parts of the nail and cut back as far as possible from the free edge as some fungi are restricted to the lower parts. Scrapings can also be taken from under the nail to supplement the clipping. Nail clippings often fail to grow fungi even is present. The sample should be sent to the laboratory in the commercial kit available from pathology. Ensure the container and request form are labelled as the specimen policy
2.9.2 Skin
Material should be collected from cutaneous lesions by scraping outwards from the margin with the edge of a microscope slide or a blunt scalpel blade – at least 4 pieces. The edge is most likely to contain viable fungus. The sample should be sent to the laboratory in the commercial kit available from pathology. Ensure the container and request form are labelled as the specimen policy.

2.9.3 Hair
Broken lustreless hair should be selected from the margin of the scalp lesion. Hair should be removed with epilating forceps. The hair follicle and one inch of proximal hair should be sent to the laboratory in the commercial kit available from pathology. Receipt of cut distal ends will not be processed. Ensure the container and request form are labelled as the specimen policy.

2.10 Collection of Peritoneal Dialysis Fluids (Cloudy fluids or those suspected of infection)
Disinfect with an alcohol wipe the portion of the dialysis bag or port from which the fluid is to be taken and allow to dry. Collect at least 30ml of fluid through the disinfected area using a sterile needle and syringe and then place in a sterile container. Discard the needle and syringe safely in an approved sharps container and label the specimen; place in the plastic transport bag. If the specimen is likely to be delayed before being sent to the laboratory it may be refrigerated at 4ºC but this is best avoided. Ensure the container and request form are labelled as the specimen policy.

2.11 Collection of Cerebrospinal fluid and operative specimens
Some specimens are collected by invasive procedures, for example lumbar puncture, bone marrow aspirate, bronchoscopy, or at operation under general anaesthesia. Such specimens tend to be non-repeatable and from normally sterile sites, hence results of culture or microscopy are of special importance. It is the requesting doctor’s responsibility to arrange for rapid transport of such specimens to the laboratory and provide notification of their arrival in-hours or out-of-hours to the on-call BMS if the specimen is urgent. Ensure the container and request form are labelled as the specimen policy.

CSF must be collected by means of strict aseptic technique in order to minimise specimen contamination. The volume of CSF obtained will limit the number of investigations available. Indicate, first, second third and fourth specimens where applicable. Indicate if EVD, shunt, etc. Serial red blood cells counts are unnecessary to confirm a diagnosis of subarachnoid haemorrhage and will NOT be carried out. Do not request ‘culture’ unless meningitis is suspected. Requests for PCR must be authorised by the Consultant-In-Charge of the patient.

The results of microscopy are available on the computer as soon as they are available. Positive culture results are communicated to the patient’s doctor by a medical microbiologist.

2.12 Cross infection screen / Renal / Pre-operative screens
A specific request form is available for cross infection screening (for MRSA, Staph aureus and multi-resistant coliforms), this can be used for multiple samples.
2.13 Virology/Serology investigation Referred to Virology Labs, Bristol HPA
For any tests listed below please refer to the HPA website which references the collection, sampling and criteria required for these tests.
http://www.hpa.org.uk/cfi/reference_tests_index.htm
## TESTS REFERRED TO BRISTOL HPA

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### 2.14 Referred Microbiology Tests (Other tests not shown may be arranged by consultation with the Medical Microbiologist.)

The following Reference Laboratories are used for conformation and specialist testing services:

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<td>HPA Southamptom</td>
<td>Tetanus serology</td>
<td>HPA Leeds</td>
</tr>
<tr>
<td>Fasciola serology</td>
<td>London School of Tropical medicine</td>
<td>Tick ID</td>
<td>Bristol University, FAO Dr Lee</td>
</tr>
<tr>
<td>Filariasis serology</td>
<td>London School of Tropical medicine</td>
<td>Toxocara serology</td>
<td>London School of Tropical medicine</td>
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<tr>
<td>Group A Strep serotyping</td>
<td>HPA Colindale</td>
<td>Toxoplasma serology</td>
<td>HPA Swansea</td>
</tr>
<tr>
<td>Haemophilus PCR</td>
<td>HPA Oxford</td>
<td>Trypanosomal IPAT</td>
<td>London School of Tropical medicine</td>
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<tr>
<td>Haemophilus serology</td>
<td>HPA Oxford</td>
<td>Wells (disease)</td>
<td>HPA Hereford</td>
</tr>
<tr>
<td>HHV-8/Herpes simplex 8</td>
<td>HPA Colindale</td>
<td>Whipples - EDTA/CSF/Gastric biopsy</td>
<td>Leeds General (NOT serum)</td>
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<tr>
<td>Hydatid serology</td>
<td>London School of Tropical Medicine</td>
<td>Widal (needs reason - see Senior)</td>
<td>HPA Colindale</td>
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<tr>
<td>Leishmania</td>
<td>London School of Tropical medicine</td>
<td>Yellow fever</td>
<td>Porton Down</td>
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