Microbiology

UK Clinical Virology Network

UK Clinical Mycology Network UKCMN Promoting quality in Medical Mycology

Microbiology Service User Manual

INDEX

1 INTRODUCTION AND SCOPE

The purpose of this document is to provide users with clear information on the Microbiology service provided by East Kent Hospital University Foundation Trust (EKHUFT). It includes information regarding the pre-examination activities of specimen collection and handling prior to analysis in the laboratory, to ensure that results are accurate and clinically useful.

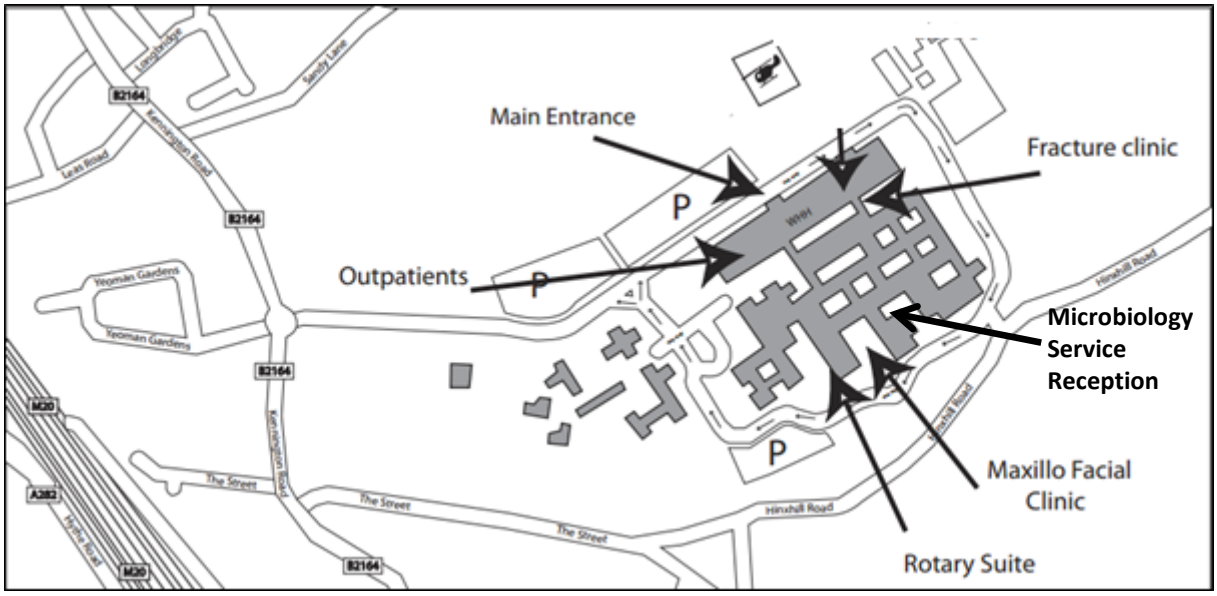
Ownership and accountability of the user manual lies with the Microbiology Service Head of Service.

The scope of this user guide includes routine, urgent samples, sample containers, transportation and turnaround times from specimen receipt to results becoming available. The intended audience for this user manual is healthcare professionals; however instructions for self-taken specimen collection have been included for distribution to patients.

2 GENERAL INFORMATION ON THE USE OF THE MICROBIOLOGY LABORATORY

The Microbiology Service is based at the William Harvey Hospital (WHH) in Ashford and provides diagnostic Microbiology services (Bacteriology, Parasitology and specialist Virology/Mycology investigations) and Infection Control services to EKHUFT and GP/Community services. The Microbiology Service also hold Hepatitis B (500iu and 200iu), and Rabies (2.5iu/ml) immunoglobulin on behalf of Public Health England (PHE).

2.1 Locating and contacting the Microbiology Laboratory



Microbiology Service
The William Harvey Hospital
Kennington Road
Willesborough
Ashford
Kent TN24 0LZ

Tel: 01233 616760 (Mon – Sat for routine enquiries)
Sunday – urgent enquiries only, via switchboard (01233 633331)

2.2 Laboratory opening hours

08:30 – 19:00	Weekdays
08:30 – 17:00	Weekends and bank holidays

2.3 Medical advice

Consultation about the investigation and management of infection is welcomed. Early liaison over infection control matters, especially outbreaks is encouraged. Consultant Microbiologists are available to advise on examinations, the use of services (including the required type of sample), clinical indications and limitations of the examination procedure and the frequency of examination requests and interpretation of results (ISO 15189:2012 4.7a).
The laboratory staff includes 5 Consultant Microbiologists who provide a service across the three main hospital sites at Ashford, Canterbury and Margate.
The laboratory maintains close links with the University of Kent.
Medical advice can be obtained by telephoning the department (see section 2.1) or via the WHH switchboard out of hours: **ask for the On-Call Medical Microbiologist.**

2.4 Senior members of the Microbiology Service

Head of Service, Consultant Microbiologist	Position vacant
Consultant Microbiologist and Virologist	Dr S Moses MBBS, MRCP, FRCPath (Virology), CCT in Microbiology & Virology
Consultant Microbiologist and Antenatal & Newborn Screening Clinical Lead	Dr M Strutt MBBS, MSc, FRCPath
Consultant Microbiologist & Antimicrobial Stewardship Lead	Dr S Glass MEng MBBch MRCP FRCPath
Consultant Microbiologist & Infection Control Doctor	Position vacant
Consultant Clinical Scientist in Virology & Infection	Dr E Meader PhD FRCPath
Pathology General Manager	Mr M Coales MPhil
Laboratory Manager	Mrs R Arkley CSci FIBMS

Chief Biomedical Scientist (Bacteriology)	Mr Michael Dawson MSc FIBMS
Chief Biomedical Scientist (Virology) and Antenatal & Newborn Screening Laboratory Lead	Mrs Claire Warren PGDip, MIBMS
Quality Lead	Miss N Rogers MSc, FIBMS

2.5 Infection Prevention and Control Nursing Team

The Infection Prevention and Control Specialist Nurses provide advice on all aspects of Infection Prevention and Control whereby specific Consultant Medical Microbiologists advice (i.e. antimicrobial prescribing) is not required.

Director Infection Prevention & Control / Decontamination Lead	Dr Neil Wigglesworth
Deputy Lead Nurse / Operational Lead	Vacant

Infection Prevention and Control (IPC) Team WHH

IPC Clinical Nurse Specialist	Ms Sheenagh Lamdin (WHH)
IPC Sister	Thanu Thapa (WHH)
IPC Assistant Practitioner	Paul Allen

Infection Prevention and Control (IPC) Team K&C

Matron of IPC	Mrs Catherine Maskell (QEQM)
IPC Clinical Nurse Specialist	Anthony Maskell
IPC Charge Nurse	Robert Cardwell
IPC Assistant Practitioner	Erika Knowles

Infection Prevention and Control (IPC) Team QEQM

IPC Clinical Nurse Specialist	Maria Sagkrioti
IPC Practitioner	Karen Webster

IPC Assistant Practitioner	Vacant

Contact telephone numbers for Infection Control staff:

WHH	Ext: 723 8202 / 723 8198
K&C	Ext: 722 4049 / 722 2495 / 722 4216
QEQM	Ext: 725 3625 / 725 3893

Out of hours Infection Control nursing advice is available via switchboard between the hours of 17:00 – 08:00 Monday to Thursday and from 17:00 Friday to 08:00 Monday. Ask for the on-call Infection Control Nurse Specialist.

3 COMMENTS, COMPLIMENTS & COMPLAINTS

The Microbiology Service Laboratory is committed to offering high quality specialist microbiology services that meet and respond to the needs of all service users.

If something has gone wrong or you are not happy with any aspect of our services then please do let us know or alternatively if there is something we have done well we would be grateful for your feedback. There are two main ways that you can make a compliment, complaint or raise a concern:

i. Contact the Laboratory Directly:

Contact the laboratory directly either by telephone, email or in writing as below.

Telephone the Laboratory - 01233 616760

Ask to speak to the Head Biomedical Scientist or the Chief Biomedical Scientist.

E-mail the Head Biomedical Scientist or Chief Biomedical Scientist on:

Head Biomedical Scientist: rachael.arkley@nhs.net

Bacteriology Chief Biomedical Scientist: michaeldawson1@nhs.net

Virology Chief Biomedical Scientist: claire.warren@nhs.net

Write to the Laboratory at:

Head Biomedical Scientist
Microbiology Service Laboratory
William Harvey Hospital
Kennington Road
Ashford
Kent
TN24 0LZ

Direct contact with the Laboratory is often the best way to make a complaint as it means that we can quickly understand the problem and take immediate action to investigate and resolve the situation.

ii. Contact the Patient Experience Team

If you prefer you can also make a complaint via the Patient Experience Team on the contact details below:

Telephone: 01227 783145 or 01227 864314 9am – 4pm Monday - Friday
E-mail: ekh-tr.patientexperienceteam@nhs.net or ekh-tr.PALS@nhs.net
Write: Patient Experience Team, First Floor, Trust Offices, Kent and Canterbury Hospital, Ethelbert Road, Canterbury, Kent, CT1 3NG.

The Laboratory follows the Pathology Policy for the Management of Comments and Complaints Raised by Patients, Relatives or Users of the Service in line with the Trust Policy and national guidance. In all cases our aim is to ensure that complaints and concerns are resolved quickly and thoroughly with appropriate investigation and resolution.

4 QUALITY ASSURANCE

The laboratory is accredited by the United Kingdom Accreditation Service (UKAS) to ISO 15189. Details are available on the UKAS website www.ukas.com, (click on Search UKAS Accredited Organisations and type 9399 in the search function).

Where tests are not included on the laboratory's scope of UKAS accreditation the following caveat is added to the report:

East Kent Microbiology is a UKAS accredited laboratory, this test however does not appear on our accredited scope of practice.

External quality assessment (EQA) schemes assess the Microbiology Service's performance against other laboratories. The Microbiology Service participates in the UK National External Quality Assessment Scheme (UKNEQAS) for many of the microbiological investigations performed by the Microbiology Service where a scheme is provided.

UKNEQAS schemes the Microbiology Service currently participate in:

- Anti-HBs detection
- Antifungal susceptibility
- Antimicrobial susceptibility
- Blood Donor Screen
- *Clostridium difficile*
- *C.trachomatis & N gonorrhoeae*
- CMV DNA quantification
- COVID-19/SARS-CoV-2 antibodies
- Cryptococcal antigen detection
- Diagnostic serology hepatitis
- Faecal parasitology
- Fungal Biomarkers (Galactomannan)
- General bacteriology
- Genital pathogens
- Hepatitis B DNA quantification
- Hepatitis B serology
- Hepatitis C RNA detection
- Hepatitis C serology
- Hepatitis E serology
- HIV serology
- HIV1 RNA quantification
- Immunity screen
- Interferon Gamma Release Assay
- Lyme serology (CSCQ)
- Measles & Mumps IgG serology
- Molecular detection of SARS-CoV-2
- Molecular detection of viruses in CSF
- MRSA screening
- Mycology
- Parvovirus B19 and Rubella serology
- Respiratory rapid: RSV
- Rubella IgG serology
- Syphilis serology
- Toxoplasma serology
- Urinary antigens
- Viral gastroenteritis

QCMD schemes the Microbiology Service participate in:

- Bacterial Gastroenteritis
- Mycoplasma genitalium

Labquality schemes the Microbiology Service participates in:

- Blood culture
- Cytomegalovirus antibodies
- Mycoplasma pneumoniae, antibodies
- Respiratory multiplex nucleic acid

- Helicobacter pylori, antigen detection in faeces

LGC Standards schemes the Microbiology Service participates in:

- Meningitis panel multiplex
- Mycoplasma genitalium (molecular)
- Giardia and Cryptosporidium
- SARS-CoV-2 (molecular)

Internal quality assurance (1% of our work is re-submitted to determine reproducibility and repeatability), internal quality controls and a comprehensive audit schedule are used to monitor the quality of results.

5 DATA CONFIDENTIALITY

The Microbiology Service complies with the requirements of the Data Protection Act, the Caldicott Principles on safeguarding patient confidentiality and information, and the Royal College of Pathologists' guidance. All patient identifiable information is regarded as confidential and is only released for official purposes i.e. to professionals with responsibility for patient care or public health. All confidential data is stored securely and only held as long as necessary for operational purposes.

6 ROUTINE SAMPLES

The laboratory is fully staffed during its routine opening hours (see section 2.2). Outside of these routine working hours, only essential work can be undertaken.

The laboratory aims to attend to all microbiological samples for routine culture on the day of receipt and results will be reported according to published turnaround times in section 26. Some serology investigations are batched but may be processed urgently by arrangement with the laboratory.

7 URGENT SAMPLES

The laboratory should be contacted by telephone when an urgent sample is being sent.

Samples **MUST** be packaged in BS regulation transport containers provided at **K&C Main Reception and QEQM A&E**. See section 11.

Please ensure that samples are transferred to the Microbiology service at WHH as soon after collection as possible. Outside of EKHUFT the requestor **MUST** arrange a taxi service to transport the samples to Microbiology WHH.
Within EKHUFT sites the requestor **MUST** arrange transportation to the on-site Pathology department. The Pathology department at the Kent and Canterbury and Queen Elizabeth The Queen Mother hospitals will arrange transport to the Microbiology Service at WHH.
During normal working hours, please telephone the laboratory on the external number (section 2) or using the internal number 723 8370 or 723 8112. Please mark the request as **'Urgent'.**
Outside of normal working hours please telephone the on-call Biomedical Scientist via switchboard. Please mark the request as **'Urgent'.**

8 SPECIMEN REJECTION

Specimens may be rejected by the laboratory if:

1. There is insufficient volume of sample.
2. The sample is received in an inappropriate container e.g. jam jar
3. The request is inappropriate for the specimen type.
4. The details on the sample do not match the request.
5. Unlabelled specimens (a minimum of three points of patient identification (full name, full date of birth and identification number) is required).
6. Requests containing insufficient information.
7. Leaking specimen containers
8. The sample is too old to process and give reliable results
9. The sample has been stored in an inappropriate environment i.e. excessive temperature.

However if blood cultures, tissues or joint, pleural, ascitic, CSF fluids are received as described above the ward would be contacted prior to the decision to discard the specimen.

9 ORDERING CONSUMABLES (E.G. SPECIMEN CONTAINERS)

Please note that supplies of Blood Culture kits, Pernasal swabs, TB urine containers, and kits for flu surveys must be requested from the Microbiology Service – please see section 2.1 for contact details.

To order all other microbiology consumables (please see embedded supplies form Appendix 16) for your department/surgery please complete the supplies form (Appendix 16) and send the request to the Supplies and Procurement Team:

ekh-tr.PathologyOrder@nhs.net

01233 633331 Ext. 723-8403

10 LABELLING SPECIMENS AND REQUEST FORMS

Details in bold are ESSENTIAL, these may be hand written or labels can be used

10.1 Specimen labelling

Labelling must be on the body of the sample pot to be accepted, any labelling on the lid may be discounted. All samples MUST be labelled in the presence of the patient.

- **Last name/Surname AND First Name** (or coded identifier as in GU patients);
- **Date of Birth and / or NHS/Hospital number**
- **Specimen type(s) and anatomical site(s) (essential for Microbiology).**

Samples labelled with initials rather than full name will not be accepted unless BOTH DOB and NHS/Hospital number are present.

Any sample that has been relabelled (crossing out visible on the sample tube) will not be accepted

For Microbiology **the site and specimen type is ESSENTIAL** on the samples.

10.2 Request Form Labelling

Details in bold are ESSENTIAL

- **Last name/Surname (or coded identifier as in GU patients);**
- **First name;**
- **Date of Birth;**
- **NHS/Hospital number**
- **Date of sample;**
- **Tests required;**
- **Address/location for report;**
- **Anatomical site/type**
- Clinical details
- Consultant/GP name;
- Time and Date of Sample (essential for test specific samples)

- Contact/bleep number of requestor;
- Urgency of request.
- Initials of person who took sample (blood tubes)
- Source/location of patient
- **NB: all antenatal specimens must have patient consent indicated on the request form –** for all other specimens it is assumed that patient consent has been given to the clinician following an explanation about the tests proposed. This must include consent to disclose clinical information and patient history to relevant healthcare professionals where referral is required.

All samples MUST have a minimum of three points of patient identification, (full name, full date of birth and identification number)**.**

NB: PLEASE ENSURE THAT THE SPECIMEN IS PLACED IN THE LARGE PLASTIC POCKET OF THE SAMPLE REQUEST FORM.

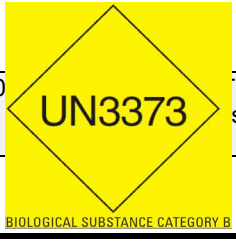
11 COLLECTION AND TRANSPORT OF SPECIMENS TO THE LABORATORY FROM GP SURGERIES / PRIVATE HOSPITALS / NON-HOSPITAL BASED CLINICS

Please see appendices for instructions on specimen collection.

As soon as the specimen has been collected, the container (labelled correctly) must be placed in the integral transparent plastic transport bag immediately after taking the sample.

The transport bag must be sealed by means of an integral sealing strip as indicated on the request form. Bags must not be sealed with pins, staples or metal clips etc.

Samples are collected regularly from the GP surgeries / private hospitals / non-hospital based clinics by the EKHUFT transport vehicles. The specimens must be placed in robust, secure and safe Category B transport boxes designed specifically for transporting biological specimens.



12 TRANSPORTING SPECIMENS FROM EKHUFT WARDS AND HOSPITAL BASED CLINICS

Please see appendices for instructions on specimen collection.

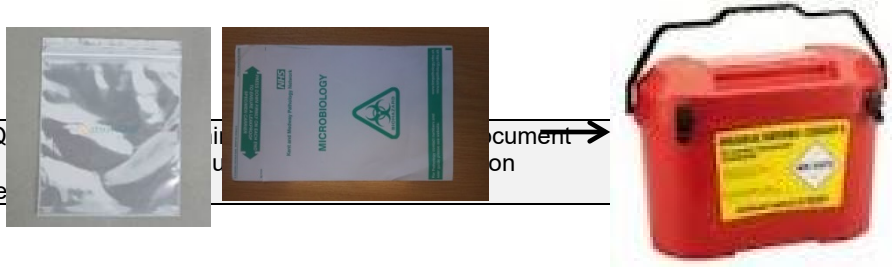
N.B. To ensure samples are transported promptly and arrive at WHH microbiology the same day as collection, please note the following cut off times for sample arrival at the relevant pick-up point are as follows:

K&C Pathology Reception	15:30
QEQM Pathology Reception	14:00
BHD Phlebotomy	15:30
RVHF Phlebotomy	14:30

12.1 Transport of high risk sample e.g Viral Haemorrhagic Fever (VHF)

Please refer to Section 02D Policy for the Management of Viral Haemorrhagic Fever (VHF) in the Infection Prevention and Control policies.
All specimens taken from suspected VHF infection patients must be transported to the laboratory in a sealed specimen bag placed in a closed appropriate transport box.
Specimens MUST NOT be carried by hand to the onsite Pathology department or be put through the pneumatic tube system.
The clinician taking the specimens **MUST** inform the onsite Pathology department and Microbiology at the William Harvey Hospital. The clinician must also ensure the samples are transported to the onsite Pathology department **immediately** after the sample has been taken.

Items required for sending specimens to onsite Pathology department:



12.2 Transport of all other specimens

The labelled sample container of all specimens must be placed in the integral transparent plastic transport bag immediately after taking the sample.

The transport bag must be sealed by means of an integral sealing strip as indicated on the request form. Bags must not be sealed with pins, staples or metal clips etc.

Blood cultures must be sent immediately to the Pathology department using the pneumatic air specimen transport system (POD).
All other specimens with the exception of:

CSF samples
Urine samples greater than 50ml
Faeces samples

may be transported using the POD or alternatively collected by Porters, who must place the packed specimen inside a red biological specimen transport box to transfer the samples to the Pathology department:

Pathology staff must transfer the specimens into the blue transport bags prior to placing in the appropriate area for collection by the EKHUFT transport service that transfers specimens to the Microbiology department at WHH.

13 REQUESTING ADDITIONAL INVESTIGATIONS

Requesting additional tests on microbiology samples cannot usually be performed unless they are serum samples. The following serum samples are retained for a minimum of 2 years and appropriate additional investigations may be requested for these serum samples at any time during this period providing there is sufficient volume of sample:

1. Renal transplant screens
2. Antenatal screens
3. Needlestick
4. Any sample where the submitting clinician has specified the serum to be saved.

Please note: it is often not possible for additional investigations to be added to serum samples which have been sent for blood sciences investigations. If serology is required, an independent sample must be sent.

14 ON-CALL INVESTIGATIONS

There is a 24hr ON-CALL service for processing samples and providing Medical advice for William Harvey Hospital (WHH), Kent & Canterbury Hospital (K&C) and Queen Elizabeth the Queen Mother Hospital (QEQM). Samples from K&C and QEQM are transported to Microbiology at WHH for processing (see section 14.4).
The On-Call Biomedical Scientist (BMS) and Medical Microbiologists can be contacted via the EKHUFT switchboard.

Please **DO NOT** contact the On-Call BMS when blood cultures are performed as there are procedures in place for hospital porters to take them directly to the Pathology reception area.

Blood cultures are continuously monitored by an automated detection system 24hrs a day. All positive results are telephoned to the appropriate medical staff. **Please DO NOT call the laboratory to check whether a blood culture is positive.**
Please complete request form (electronic or written) clearly giving the **Ward, Requesting Doctor and the bleep/contact number.** Staff on other sites may not be conversant with abbreviations used locally.

14.1 Tests available out of hours

Samples are accepted and processed where necessary, up until 19:00 on weekdays and 17:00 at weekends and on bank holidays. After this time, only the following samples will be processed without requiring discussion and approval from the On-Call Consultant Microbiologist:

a) CSF samples (Filmarray performed the following working day)
b) Corneal scrapes
c) Ascitic & pleural aspirates (up until 1900 hours)
d) Joint, pericardial & peritoneal aspirates (up until midnight)
e) Tissues & pus collected during surgery (up until midnight)

All other requests should be referred to the On-Call Consultant Microbiologist for advice or approval.

14.2 On-call service at William Harvey Hospital

All **ON-CALL** Microbiology samples should be delivered to the **WILLIAM HARVEY HOSPITAL PATHOLOGY RECEPTION AREA**.

14.3 Microbiology on-call service at K&C and QEQM

There is no on-call microbiology service at K&C and QEQM. Urgent samples that require processing out of hours need to be arranged via the on-call microbiology service that operates at the WHH site.

14.4 Microbiology On-Call specimen procedures – FOR REQUESTING CLINICIANS

These are the procedures for **URGENT Microbiology** samples that require testing between Monday to Friday 17:00 – 08:30 & anytime at weekends and public holidays.
Urgent samples may include those listed in section 14.1 a – e.

i. Collect the sample, but do not send before contacting the on-call Microbiology Biomedical Scientist.
ii. Contact the on-call Microbiology Biomedical Scientist (BMS) **via switchboard.** Provide the Microbiology BMS with the patient name, ward, hospital and test required.
iii. Send samples and completed request form **immediately** to **Pathology Reception**, where pathology staff will pack the samples securely and arrange transportation.
iv. The sample will be collected by an emergency transport service (Taxi or SERV) from **Pathology Reception.**
v. **Results will be available on Patient Centre (preliminary results) or DART (authorised results) as soon as possible** and results will only be telephoned if clinically significant and could influence the management of the patient.

14.5 Microbiology On-Call Procedures – FOR PATHOLOGY STAFF

These are the procedures for **URGENT** Microbiology samples that require testing between Monday to Friday 17:00 – 08:30 & anytime at weekends and public holidays.

1. The microbiology on-call sample will be taken to the pathology reception by the requesting doctor, nurse or porter.

2. The on-call Microbiology Biomedical Scientist will contact the Blood Science Continuous Processing Pattern (CPP) staff member to ALERT them that the sample is coming down to reception also **providing the name of the patient and sample type.**
    a) K&C contact number – Biochemistry Ext **722-3174** alternative **722-5065** or via switchboard **bleep 7022**
    b) QEQM contact number – Biochemistry Ext **725-4428** or **bleep 6131.** Or before 1700 call Specimen Reception on Ext **725-4250**

3. The Microbiology BMS will also inform the CPP staff to either order a taxi or contact SERV depending on the time of day.
4. The CPP blood science member of staff will locate the sample in pathology reception and then package sample up into the designated transport box (see below).

5. **Between 06:00 and 19:00 hours** CPP staff contact switchboard to arrange a taxi for URGENT samples to be **collected from pathology reception** for delivery to pathology reception at WHH. (NEW arrangement:-taxis previously collected from switchboard or A&E)

6. **AFTER 19:00 hours and before 06:00 hours** CPP staff contact SERV **(01227 200 608)** for URGENT samples to be **collected from pathology reception** for delivery to pathology reception at WHH.

7. CPP pathology staff to contact the on-call Microbiology Biomedical Scientist **(Lab on call mobiles 07825 977 169, 07580 831 056 or switchboard if unobtainable)** to ALERT them that the **TAXI** or **SERV** driver has collected sample from pathology reception.

14.6 Contacting the Consultant Microbiologist

The Consultant Microbiologist on-call duties are detailed as follows:

17:00 – 09:00 Monday to Friday
24hrs on Saturday, Sunday and Bank holidays.

14.6.1. Before 21:00

Between the hours of 17:00 – 21:00 Monday to Friday and 09:00 – 21:00 on Saturday, Sunday and Bank Holidays, the on-call Consultant Microbiologist will accept calls from junior doctors and other staff seeking advice.

14.6.2. Between 21:00 and 09:00

Between the hours of 21:00 – 09:00 from Monday to Sunday including Bank Holidays, please see the following criteria for communicating with the on-call Consultant Microbiologist:

a) During the above hours there is an advice and guidance service only available for all issues relating to Microbiology.
b) The Consultant Microbiologist on-call will only accept calls from on-call Consultants, registrars and staff grade doctors.
c) The Manager on-call will be able to speak to the Consultant Microbiologist if necessary for advice and guidance.
d) Switchboard are instructed to check the designation of the member of staff wishing to be connected to the Consultant Microbiologist's mobile or home telephone number.
e) Switchboard will only connect Consultants, Registrars and staff grade doctors and/or on-call Managers during the hours specified above.

15 SUBMITTING SAMPLES TO THE LABORATORY

15.1 Specimen requisition

Electronic requisition (DART for GPs and ward order comms for hospital users) should be used whenever possible to allow access to patient results in a timely manner.
Where DART is used for specimen request please either finalise the request by selecting 'collection at surgery' or 'collect at home'. When 'collect at home is selected, please print the form to give to the patient and ask the patient to record the date and time of collection on the form and return the specimen and form to the surgery. The surgery should then enter the date and time of collection onto DART and finalise the request by selecting 'collection at surgery'. This will generate an adhesive barcoded label which must be adhered to the specimen container. Please do not send non-barcoded samples with the DART form to the laboratory.
Where electronic request cannot be made, handwritten forms should be completed ensuring they are legible and signed by the person requesting the investigation.

Adequate clinical details **must** be provided, including the following information when relevant:

a) Patient demographics, including NHS number
b) Reason for request
c) Date of onset of illness
d) Date and time the specimen was collected
e) System(s) involved
f) Site of infection (especially for wounds)
g) Date of surgery if applicable
h) Previous and planned antibiotic therapy
i) History of travel and vaccinations (details of countries visited are essential)
j) If possible, a diagnosis or provisional diagnosis should be given. Any defects in host defences e.g. immunosuppression should be mentioned.

15.2 Preparation to collecting specimens

NB: Hands must be decontaminated with alcohol hand rub and the appropriate protective equipment (i.e. disposable plastic apron and gloves) worn prior to the SPECIMEN being collected.

See also EKHUFT Infection Control Manual 2015: Section 1, Introduction to the Infection Prevention and Control Manual, which provides additional guidance/information on the collection of specimens.
All samples must be clearly labelled and dated (see section 10).

Specimens must be collected in the appropriate screw capped CE leak proof container. The containers (see sections 17 and 18) must be shatter proof, not overfilled, the lid secured tightly, and the specimen placed in a specimen bag.

The expiry date of the sample container must be checked before using to collecting the samples – please discard any sample containers that are past their expiry date.

Swabs must be placed fully into the specimen container and then the swab handle gently pulled/pushed against the sample container opening until the swab breaks at the swab breakpoint (this ensures that the swab is the correct height to fit in the sample container) – **DO NOT** force the swab into the specimen container as this causes the container to leak.

All specimens must be singularly – DO NOT place multiple samples in one bag.

SARS-CoV-2/COVID swabs must be double bagged (using 2 sample bags) before transferring to Microbiology unless the samples are transferred in racks inside a transport bag. For URGENT COVID samples there are blue bags available from Microbiology.

For the safety of the laboratory staff, badly leaking samples will be discarded. It is assumed by the laboratory staff that a patient being investigated for HIV infection has been counselled by the doctor whose name appears on the request.

Please note that the following specimens will no longer be tested routinely:
As per agreed updates to business as usual, the decision has been made to no longer test the following specimens routinely:

- Leg and foot ulcer swabs
- Non-antenatal/ non-recurrent HVS
- Non-purulent sputa from non-chronic patients
- Formed stools
- Mycology specs except for tinea capitis
- Asymptomatic CSU samples, excluding ITU
- ITU throat screens except for Candida or in an outbreak setting

16 OPTIMISING THE VALIDITY OF RESULTS

There are many factors that may affect the results obtained from laboratory investigations. Good laboratory practice and the laboratory quality management system minimises those factors that could occur within the laboratory. However the following factors that may contribute to erroneous laboratory results are out of the laboratory's control:

Factors that may affect results:	Reducing the risk:
Delays in transporting samples to the Microbiology Service @ WHH. Samples should be submitted for investigation as soon as possible following collection to prevent deterioration of cells and changes in the relative quantities of micro-organisms present. The date of sample collections must be included with all requests.	• Ensure samples are transferred to pathology as soon as possible after collection to prevent deterioration of cells and changes in the relative quantities of micro-organisms. • Notify microbiology of any urgent samples prior to sending them. • Use the POD system to transport blood cultures to Pathology
Insufficient volume of sample sent to the laboratory	• Fill blood culture bottles appropriately – see Appendix 11. • Where possible adhere to fill lines on sample containers (please do not overfill)
Contaminated samples	• Adhere to sampling guidelines in EKHUFT Infection Control Manual 2015: Section 1, Introduction to the Infection Prevention and Control Manual • Maintain aseptic sampling technique • Use the appropriate screw capped CE leak proof container for collecting samples - see section 17 and 18. • Ensure sample containers are correctly sealed to prevent contamination • All sample transport containers must be securely closed to prevent sample leakage or contamination en route to the laboratory.
Inappropriate transport medium and/or sample container	• Use an appropriate plain screw capped CE leak proof specimen container to collect samples – please see section 17 and 18.

Factors that may affect results:	Reducing the risk:
Inappropriate sample request	• Ensure that the information on the request is correct, include the patient's clinical history – please see section 10.
Inappropriate storage conditions. Exposure to significantly raised or reduced room temperatures may affect the results obtained during laboratory investigations.	• If the appropriate sample transport media and containers are used, please refer to section 19 for further details.
Sample quality. The result of the laboratory investigation is dependent on the quality of the sample submitted to the laboratory.	• Ensure there is sufficient material or cells in the sample or on swabs. • Ensure the sample type is appropriate i.e. MSU or EMU • Ensure the sample site is clean • Maintain good aseptic techniques during sample collection.
Presence of inhibitory substance in the samples. The presence of antimicrobials or other inhibitory substances in the sample may affect the results of laboratory investigations and the subsequent recovery of micro-organisms.	• Any antimicrobial therapy the patient is on should be recorded in the clinical details section of the request.

Recovery of micro-organisms or detection of cells, antigen or antibody is dependent upon the amount of micro-organisms, antigen or antibody present in the sample. Low levels in the sample may not be sufficient to detect by the microscopy, culture or assays employed by the laboratory.

Further details on specimen transportation and sample integrity can be found below.

Sample type.docx

Please note that a single negative result does not exclude infection or immunity status and multiple repeat investigations may be required to obtain a definitive diagnosis.

17 COLLECTION OF SAMPLES – ROUTINE BACTERIOLOGY

17.1 Blood culture specimens:

17.1.1. PUO from tropical areas

Priority should be given to diagnosing and treating Malaria investigations, these are performed by the Haematology Department. Please contact the Haematology department via the hospital switchboard – 01233 633331.

If the onset of fever >38˚C was less than 21 days after leaving a tropical area, the possibility of Viral Haemorrhagic Fevers (VHF) must be considered. Such cases must be discussed with the on-call Medical Microbiologist before admission to any general ward area and collection of blood cultures.

17.1.2. Fever in HIV infected patients.

In addition to routine blood cultures cases of unexplained fever in HIV positive and severely immunocompromised patients may require additional investigations. These may include…

CMV
Toxoplasma
Syphilis
Hepatitis B
Cryptococcal antigen if CNS symptoms are present (CSF can also be screened).

Fungal investgations
Routine mid-stream urine (MSU)

MSU in viral transport medium to exclude CMV
Early morning urine (EMU) x 3 for TB if appropriate (only applicable in renal or if miliary TB is suspected)

If respiratory symptoms present:

Sputum for routine bacteriology and TB
Bronchial washings or 'induced' sputum for Pneumocystis carinii (sputum is not useful).
Faeces if diarrhoea or 10% baseline weight loss.
Please refer to relevant sections of this user guide for full specimen requirements and collection details.

17.1.3 Specimen collection- Blood cultures

Collect specimens as soon as possible after the onset of clinical symptoms. Although blood can be sampled at any time, drawing blood at, or as soon as possible after a fever spike is optimal, except in endocarditis where timing is less important. Empirical treatment within the first hour has been shown to maximise the chances of survival. Please refer to Microguide

Blood culture is a culture of blood collected from a single venepuncture site inoculated to one or multiple bottles. A blood culture set is defined as one aerobic and one anaerobic bottle. For infants and neonates, a single aerobic bottle may be requested. Whenever possible it should be performed before antimicrobial therapy is commenced, however do **NOT** delay administration.
Full instructions are provided with each blood culture set, **please note** that the blood culture collection kits **DO NOT** automatically prevent overfilling, please monitor until the correct volume has been collected.
In pyrexial patients with central or tunnelled IV lines, consider taking 'central' blood cultures via the IV line in addition to the normal peripheral vein blood cultures. This may help to implicate an infected line as the source of sepsis. If peripheral cultures cannot be collected, take a 2nd set of cultures from the central line using a fresh syringe, having discarded 5ml aspirated from the line.

NB: Care must be taken to avoid contamination. It is important to fill the blood cultures with the **correct volume** of blood:

Adults 10mls in each bottle (1 x Aerobic (green) & 1 x Anaerobic Bact/Alert (purple))

Paediatric 4mls in Bact/Alert (yellow)

Volumes greater than or less than these recommended volumes **DO NOT** maintain the optimal blood to medium ratio and may affect the recovery of organisms. Monitor until correct volume is achieved – there is **NO automatic shut off** to prevent overfilling

After inoculation, the blood cultures (the entire blood culture pack must be returned) **MUST be transported to the laboratory immediately. Out of hours blood cultures should be placed in the main Pathology Reception on each acute hospital site.** Blood culture bottles **must not** be placed in a refrigerator.

17.2 Cerebral Spinal Fluid

17.2.1. Meningitis and encephalitis

Suspected meningitis/encephalitis should be treated **IMMEDIATELY** with reference to Microguide for empirical therapy without waiting for confirmation. In 80% of cases antigen detection or Polymerase Chain Reaction (PCR) will yield a positive result even after antibiotic

administration. It is **not** acceptable to make a diagnosis of meningococcal septicaemia in A&E and then delay commencement of therapy pending admission and clerking on the ward. Please inform the Medical Microbiologist **and** the PHE local Heath Protection Team (HPT) when a patient is admitted with suspected meningitis. When meningitis is suspected, telephone the laboratory (or on call Biomedical Scientist out of normal working hours) as soon as the sample is collected to minimise delay.

Lumbar puncture should not be attempted if raised intracranial pressure is likely. Absence of papilloedema does not exclude recent onset of raised intracranial pressure. If in doubt, arrange for a CT scan to exclude raised pressure before attempting the lumbar puncture. In suspected cases of meningitis/encephalitis the samples should be collected as soon as possible:

For routine CSF examination send the following samples to Microbiology:

CSF:	1 to 3 ml in a sterile 30ml universal container (white cap) (x2 if possible in case further tests are needed). CSF MUST be transported to the laboratory immediately after collection – time between microscopy and collection should be a maximum of 2 hours (PHE, 2017)	
Blood	**Adults** 10mls in each bottle (1 x Aerobic (green) & 1 x Anaerobic Bact/Alert (purple))	
	Paediatric 4mls in Bact/Alert (yellow)	

An EDTA (purple top vacutainer) blood SAMPLE for meningococcal PCR should always be sent to Microbiology when either meningococcal meningitis or septicaemia is suspected.

If viral meningitis or encephalitis is suspected the CSF samples may be examined in house or referred to a reference laboratory (please see section 20).These tests will be at the discretion of the Consultant Microbiologist.

Tests performed on CSF:

- Bacterial Culture
- White blood cell count (WBC) and differential if the white count is raised
- Red blood cell count.
- Gram stain if WBC count is raised
- Polymerase Chain Reaction (PCR) screen for common causes if WBC is raised or at the discretion of the Consultant Microbiologist
- Bacterial antigen screen for *Streptococcus pneumoniae* when indicated.

At the discretion of the Consultant Microbiologist samples may be sent to a reference laboratory for:

- PCR for meningococci

A CSF should always be submitted for PCR when *Herpes* encephalitis is suspected.

17.3 Faeces

Faeces specimens are primarily submitted to aid the investigation of diarrhoeal disease. This is defined as unusual frequency of bowel action (usually at least three times in a 24hr period), passing loose, watery, unformed faeces. The consistency of the stools is more important than the frequency: frequently passed formed stools are not considered to be diarrhoea. It may be associated with symptoms such as abdominal cramps, nausea, malaise, vomiting, fever and consequent dehydration.

17.3.1 Gastroenteritis

1. Routine Investigations.

All routine specimens are investigated for nucleic acids of:

Salmonella spp
*Shigella spp/*Enteroinvasive *E.coli*
Campylobacter spp (jejuni and coli)
Shiga toxins 1 and 2 found in Shiga producing *E.coli (*STX*)*

Giardia and *Cryptosporidium* antigen detection by ELISA

Further investigations may be indicated based upon clinical details provided and Consultant Microbiologist discretion. It is essential that full, clear and comprehensive clinical details are provided with all stool samples to ensure appropriate testing is performed.

17.3.2 Additional testing when clinically indicated

1. Rotavirus and Adenovirus EIA is routinely performed on all samples from children <5 years of age

2. Travel associated diarrhoea.
   Please ensure full travel details are provided
   Ova, Cysts and Parasite investigation
   Vibrio cholerae Culture

3. Food poisoning: – Please discuss with Consultant Microbiologist prior to submitting samples.

4. Yersinia culture

17.3.3 Clostridium difficile investigation.

Glutamate dehydrogenase (GDH) antigen ELISA, toxin A/B detection by EIA and toxin A/B gene detection by PCR are available to aid the diagnosis of *Clostridium difficile* disease.

Testing is only performed on diarrhoeal stool specimens (liquid or semi-formed faeces, Bristol stool type 5-7), which should be collected as described in section 17.3.6.

Morbid anatomy samples should be received in appropriate plain screw capped CE leak proof specimen containers which are **free from preservative.**

17.3.3.1 Repeat Clostridium difficile testing

Repeat toxin testing need only be performed on previously positive GDH/Toxin negative samples.
Specimens from toxin positive patients need repeating only once every 28 days, unless the patient shows clinical symptoms of relapse.

Repeat testing for *C.difficile* toxin is NOT normally required within 28 days of a previous toxin positive result. However, toxin testing may on occasion be requested by medical staff if there is a clinical relapse after treatment in the period 14 – 28 days after a previous positive toxin result. Such samples still need be to be examined.

NB: Stool samples for *C.difficile* 'clearance' are **not** required. 20 – 30% of patients with *C.difficile* may relapse following treatment. The Infection Prevention and Control team **must** be contacted for advice before sending a repeat faecal specimen.

17.3.4 Gastritis

Helicobacter pylori
A stool sample for antigen detection is the required sample for laboratory confirmation of current infection or treatment efficacy.

Treatment regimes are available in the British National Formulary (BNF) or in Microguide

17.3.5 Norovirus infection

Norovirus ELISA is available locally on liquid faecal samples for the investigation of outbreaks of diarrhoea and vomiting, please contact Infection Control prior to submitting requests if an outbreak is suspected.

17.3.6 Faecal Specimen collection

Faecal specimens should be submitted to the laboratory in an appropriate plain screw capped CE leak proof specimen container (do not use flimsy plastic sputum cups) as soon as possible after collection. Submit a sample that fills at least a third of the container if possible, but **please do not overfill the container**. Samples must be transported to the laboratory as soon as possible after collection as pH changes that occur in faecal specimens may affect the survival of important pathogens such as *Shigella*. The Patient should be given instructions on collecting a faecal specimen by the requesting clinician or directed to the EKHUFT website: http://www.ekhuft.nhs.uk/patients-and-visitors/information-for-patients/patient-information-leaflets/?entryid103=409665&catid=6483 (see also Appendix 4).

CLINICAL DETAILS MUST BE PROVIDED, INCLUDING:

Nature and duration of the illness

Onset date

Travel history (countries visited plus dates) Antibiotic history, if relevant

In the case of outbreak or suspected food poisoning, notify the Medical Microbiologists and the Consultant in Communicable Disease Control (CCDC) immediately.

NB: sputum, pus and urine samples may also be submitted to the laboratory for parasitic investigations. Please collect the specimen into an appropriate clean CE marked container.

17.4 Parasites

17.4.1. Faecal microscopy

Faecal samples for microscopy must be collected as described in section 17.3.6 and transferred to the laboratory as soon as possible.
Please submit three faecal samples collected over a maximum of a 10 day period.

17.4.2. Ectoparasites

Lice, ticks, bedbugs, larvae and pupa must be collected into an appropriate plain screw capped CE specimen container.

17.4.3. Endoparasites

Whole tapeworm, roundworm and proglottids must be collected into an appropriate plain screw capped CE specimen container and enough saline added to the container to cover the specimen.

17.4.4. Urine for Schistosomiasis

Total urine for Schistosomiasis must be collected between 10am and 2pm after exercise into an appropriate plain screw capped CE leak proof specimen container. Alternatively submit terminal collections over a 24 hour period. Please do not use boric acid containers.

17.4.5. Jejunal aspirates

Jejunal aspirates must be collected into an appropriate plain screw capped CE leak proof specimen container.

17.4.6. Puritis ani

Sellotape slides for threadworms (*Enterobius vermicularis*)

The specimen must be collected before the patient has defecated or washed in the morning:
Method of collection:

- Label a glass slide with a minimum of 2 of the following:
  Patient's name
  Patients date of birth
  Patient's hospital number
- Open the gluteal folds to visualise the anus - using sellotape press the sticky surface of the tape on several places on the skin around the anus..
- Attach the sticky surface of the sellotape to the glass slide
- Send the slide to the laboratory in a slide container

17.5 Tissue and fluid samples

Many aerobic and anaerobic organisms can be associated with infections of the subcutaneous tissue, joint fluids, prosthetics, and internal organs. These organisms may enter the body through various means e.g. breaks in the skin or mucous membranes through trauma, as a complication of medical treatments (surgery, implanted devices), and through the blood and lymphatic system from another site of infection. Optimal samples for culture are tissue or biopsies and aspiration by needle and syringe of the involved areas.

17.5.1. Tissue samples

Please collect tissue and biopsy specimens into an appropriate plain screw capped CE leak proof specimen container.
Gastric biopsies for Helicobacter pylori are sent to a reference laboratory for examination (please see section 20).
Gastric biopsies for CLO test should be sent to the Histopathology department for examination.
For theatre tissue samples and fluids e.g. joint revisions please use the specimen request form embedded in Appendix 16.

17.5.2. Fluid samples

The detection of organisms in fluids that are normally sterile indicates significant infection, which can be life-threatening.
NB: for microscopy the absence of bacteria seen does not exclude infection.

17.5.3. Ascitic fluid

Tests performed typically include WBC count, Gram stain and culture

Submit the specimen in an appropriate plain screw capped CE leak proof specimen container.

TB cultures should be requested when risk factors are present.

17.5.4. Pleural and pericardial fluids

Tests performed include Gram stain and culture.

Submit in a CE Marked leak proof container; indicate whether a TB culture is required.

17.5.5. Joint fluids

Tests performed include Gram stain and culture

Submit in an appropriate plain screw capped CE leak proof specimen container.

If an examination for crystals is required, submit a separate sample to the Histopathology/Cytology department where polarising microscopy is available.

17.5.6. CAPD Fluids

CAPD fluids may be submitted in an appropriate plain screw capped CE leak proof specimen container. Blood culture bottles may also be used, but a separate fluid sample should be sent if a WBC estimation and differential cell count is required.

And /or

17.6 Urine specimens

17.6.1. Tests: Microscopy, culture and sensitivity

Urine microscopy is automated, a result of <50 leucocytes/mm^3 is considered to be negative and these specimens are not routinely cultured. Samples with > 50 leucocytes/mm^3 / 50-100 leucocytes/mm^3 and >100 leucocytes/mm^3 will be automatically cultured. Specimens from pregnant women, renal unit patients, ITU patients and children of 12 years of age and under will undergo routine bacterial culture irrespective of the microscopy results. For Legionella/Pneumococcal urine antigen testing please refer to section 17.16.

17.6.2. Urine sample collection

i. Mid-stream Clean Catch Urine

This is suitable for most routine bacteriological examinations.
The patient should be given a red capped urine collection tube containing borate preservative, labelled with their name, date of birth and the sample collection date. The urine collection tube must be filled to within the two lines indicated (minimum of 3 ml, maximum of 7ml) please do not obliterate the lines by adhering labels over them.
Instructions on collecting a mid-stream urine should be given to the patient by the requesting clinician or be directed to the EKHUFT website: http://www.ekhuft.nhs.uk/patients-and-visitors/information-for-patients/patient-information-leaflets/?entryid103=409668&catid=6483 (see also Appendix 3)

ii. Bag Urine

The baby's external genitalia must be thoroughly washed, dried and a self-adhesive plastic collecting bag applied. This is removed when sufficient urine has been collected (please see Appendix 3). Interpretation of results can be complicated because of the high incidence of contamination. A Supra Pubic Aspirate (SPA) or 'clean catch' sample may be useful in such cases. Please submit a minimum of 7ml.

iii. Suprapubic Bladder Aspirate (SPA)

A needle and syringe is used to sample bladder urine directly using a suprapubic percutaneous approach (please see Appendix 3). This produces an ideal sample for bacteriology, because the problem of urethral contamination is avoided. It is particularly useful for sampling baby's urine. Transfer the urine specimen into a appropriate CE marked specimen container. Please submit a minimum of 7ml.

iv. Catheter Urine (CSU)

A catheter SAMPLE of urine should only be sent for laboratory culture if the patient has **signs of clinical sepsis** (i.e. fever or chill, associated localised loin or suprapubic tenderness) and **not** because the appearance or smell of the urine suggest that bacteriuria (bacteria in the urine).

Using a strict aseptic technique, a syringe is used to aspirate 10ml of urine from one of the self-sealing ports in the drainage tube. Urine from the collecting bag is unsuitable for culture. The closed circuit drainage system should never be disconnected to collect a urine sample (please see Appendix 3).

For MC&S, please use a red capped urine collection tube containing borate preservative

For all other catheter urine tests (with the exception of MRSA screening) please use an appropriate plain CE marked specimen container

Even closed circuit urine collection systems become colonised with bacteria about 5 days after catheter insertion. Presence of bacteria in catheter urine is therefore a normal finding after about 5 days and is not an indication for antimicrobial therapy, unless there are clinical signs of systemic sepsis. CSUs are often of doubtful clinical value and should not be collected routinely.

v. Urine samples for Chlamydia

Please ensure that a first catch is collected using the Alinity m multi-Collect Specimen Collection Kit – please see Appendix 9 for instructions

Alternatively a minimum of 10mls first catch must be collected in a plain universal (**not** a red top containing borate). Please ensure that the sample is received by the laboratory within 24hours.

17.7 Wound swabs and Pus

The skin is colonised by normally non-harmful flora. Infections of the skin and subcutaneous tissues are caused by a wide range of organisms, however the majority are caused by Staphylococcus aureus and β haemolytic streptococci groups A, C and G. Particular organisms are often typically associated with specific clinical conditions. Microbiological cultures may be undertaken to establish the causative organism enabling antibiotic sensitivity testing which is essential to ensure optimal treatment regimens.

Abscesses are accumulations of pus in tissue and any organism isolated from them may be of significance. They occur in many parts of the body as superficial infections or as deep-seated infections associated with any internal organ. Many abscesses are caused by Staphylococcus aureus alone, but others are mixed infections associated with a wide range of organisms. The site of the wound and **clinical details must be stated** on the request form so that the appropriate media can be used. Please take **only one swab** from a wound on any one occasion.

Tests performed: Gram stain (where appropriate) and culture

Pus should be sent to the laboratory in an appropriate plain CE marked specimen container rather than on a swab whenever possible.

Wound swabs – please use Charcoal swabs (black lid)
Chronic leg ulcers with cellulitis – collect swabs after removing necrotic debris, please see Appendix 12.

Chronic leg ulcers/pressure sores with no cellulitis and no fever – it is not useful to send swabs from these.

NB: Swabs are usually unsuitable for TB Culture; please consult the laboratory if TB is suspected.

17.8 Throat swabs

Throat related specimens are one of the most commonly performed procedures in patients with upper respiratory tract infections. Whilst the majority of throat infection are viral in nature throat swabs can be useful in identifying or eliminating bacterial causes.

For routine bacteriology culture use charcoal swabs (black lid), please see Appendix 12.

In cases where diphtheria is suspected consultation with the Consultant Microbiologist is recommended and relevant clinical details should be provided to ensure appropriate processing.

17.9 Nose swabs

Of limited diagnostic value nose swabs may be useful for detecting the carriage of certain pathogens such as…

Group A Beta Haemolytic Streptococci
Corynebacterium diphtheria
Staphylococcus aureus

Dry swabs are not suitable. In the absence of discharge, moisten a swab in a bacterial transport medium before taking the swab. Please use a thin wire Charcoal swab (orange lid), please see Appendix 12.

17.10 Pernasal swab (Pertussis culture)

Bordetella culture only

For the isolation of *Bordetella pertussis* in cases of whooping cough.

A special wire pernasal swab and transport medium is required, (Thin wire Charcoal swab (blue lid) Available from Microbiology WHH).

Please see Appendix 12.

Nose and throat swabs are not suitable for Bordetella culture and will not be processed by the laboratory.

17.11 Eye swabs

Infections of the eye can be caused by a variety of microorganisms which may be introduced to the eye via hands, fomites (eg contact lenses), traumatic injury or following surgery.

Tests performed include Gram stain and culture

Purulent discharge is suitable for bacterial culture.

Please use a Charcoal swab (black lid), please see Appendix 12.

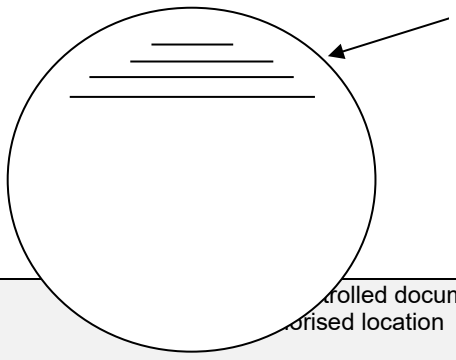
17.12 Corneal scrapes

Eye kits for corneal scraping are available from the Microbiology reception upon request.

Pus from cases of endophthalmitis can be sent in a syringe.

Collect sample and Inoculate plates by spreading the sample on the **surface** of the agar plate as shown below

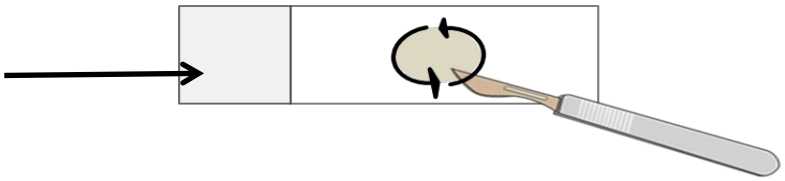
(Please do not cut into agar surface – this makes it difficult if not impossible to interpret any growth that may occur)



Please inoculate ALL plates if possible

Inoculate slide in circular motion:

Please label the slide with the patient's name – on the same side as the sample



Return plates & slide in box with a request form to Pathology Reception.

Contact On-Call Biomedical Scientist for Microbiology via switchboard if sample collected after 7 pm.

Specimens requiring Acanthamoeba culture are referred by the Microbiology laboratory to the London School of Hygiene & Tropical Medicine. Please contact the laboratory if clinically indicated.

17.13 Ear swabs

Swabs may be taken and submitted to the laboratory to aid the diagnosis of both otitis externa and media

For ear swabs, please use thin wire Charcoal transport swabs (orange lid), please see Appendix 12.

17.14 Genital swabs

Appropriate specimens are often difficult to obtain, particularly from women, and incorrect or sub-optimal specimens are often received. It is important to avoid contamination with faecal flora during collection of specimens.

Vaginal/Endocervical discharge

A high vaginal swab (HVS) in bacterial transport medium (Charcoal swab, black lid) is used for routine detection of the following pathogens:

- *Candida* sp
- Beta haemolytic Streptococci (including Group B streptococci in pregnant females)

The following can be tested if specifically requested:

- Bacterial vaginosis
- *Trichomonas vaginalis*

Gonorrhoea is diagnosed by culturing endocervical, urethral and rectal swabs using the normal charcoal bacteriology swabs. (High vaginal swabs are not suitable because Neisseria gonorrhoea does not grow in the squamous epithelium of the vagina).

For Herpes simplex, swab any visible lesion and break off the swab into viral transport medium (VTM). An endocervical swab in VTM may be useful in patients who have a past history suggestive of Herpes simplex but do not have identifiable lesions.

Pelvic Inflammatory Disease – Pouch of Douglas fluid is the best sample for the diagnosis of deep PID. Collect into an appropriate plain screw capped CE marked leak-proof specimen container.

17.15 Rectal swabs

Rectal swabs may be useful for the detection of carriage of antibiotic resistant organisms such as Carbapenemase Resistant Enterobacteriaceae, Vancomycin Resistant Enterococci and ESBL producing organisms.

Rectal swabs must be taken using black lidded charcoal swabs (there is no need to moisten the swab with normal saline). The swab must be gently inserted through the anal sphincter, rotated through one full turn and then withdrawn.

17.16 Pneumonia

Sputum culture

Routine culture to detect common respiratory pathogens includes:

- *Streptococcus pneumoniae*
- *Haemophilus influenza*
- *Staphylococcus aureus*
- *Moraxella catarrhalis*
- Fungal culture and microscopy may also be performed where clinically indicated.

Where TB investigations are required please refer to section 17.16.1 of this user manual for details.

When Legionella infection is suspected, please indicate the diagnosis clearly on the request **and request an urgent urine examination for Legionella antigen.**

- Urine samples for Legionella / Pneumococcus antigen detection are only processed when agreed by a Consultant Microbiologist. Urine must be collected in an appropriate plain CE marked screw-capped specimen container – a minimum of 3ml. Please ensure that the sample is received by the laboratory within 24hours.

- In cases of suspected pneumonia, serology may be useful for the detection of non-culturable and viral pathogens:

  - *Mycoplasma sp*
  - *Chlamydia sp* (including Psittacosis)
  - *Coxiella burnetti* (Q Fever)

- *Avian precipitins*

Pneumonia (submitted with blood culture)
Infective exacerbation of COPD
Chest infections unresponsive to antibiotic therapy (give details)
Screening of Immunosuppressed and ITU patients

60ml container (silver lid)

Samples for CYTOLOGY should be submitted separately with the appropriate request to the Cellular Pathology Department.

Patients should be instructed that true sputum is required and not saliva (i.e. collected after a deep cough; a post physiotherapy sample is ideal.

When sputum is unobtainable, a bronchial washing obtained via bronchoscope is an alternative.

Gastric washings may occasionally be useful in young children when sputum is unobtainable.

17.16.1. Mycobacterium (TB)

When TB is suspected, at least three samples should be submitted on consecutive days, in addition to a routine sample if required. Please refer to 'appropriate samples for TB below. TB culture result may take 4-8 weeks. Microscopy for Acid Fast Bacilli in the urine is unlikely to be helpful and will not be performed routinely.

Appropriate samples for TB

1. Sputum/broncho-alveolar lavage
   Sputum specimens should be less than 1 day old to minimise contamination. Approximately 5ml per sample early in the morning on three consecutive days should be collected. When the cough is dry, physiotherapy, postural drainage or inhalation of nebulised saline before expectoration may be helpful.

60ml container (silver lid)

2. Broncho-alveolar washings / bronchial washings (BAL)
   – please collect a minimum sample size of 5ml if possible.

3. Early morning urine examination
   Three consecutive COMPLETE early morning urine samples are collected on separate days into separate appropriate plain 250 ml CE marked specimen containers. These must be clearly labelled for TB culture. The three containers must be transported to the laboratory together (container for day 1 and 2 collections must be stored in a refrigerator prior to sending to the laboratory with day 3 sample). If there are no appropriate containers for whole early morning urine (EMU) sample, a midstream EMU sample is an acceptable, but not ideal alternative.

250 ml container

Available from Microbiology WHH

EMUs are usually requested when 'sterile pyuria' has already been demonstrated on routine urine culture.

4. Pus examination e.g. from cold abscesses
   Investigation for Mycobacteria may be appropriate from selected sites where routine culture is negative. Pus or pus swabs should be collected aseptically and the largest practical sample submitted in an appropriate plain screw capped CE leak proof specimen container

5. Faeces examination, Mycobacteria investigation may be requested on selected samples only. The value of such a sample is questionable and they are not commonly submitted though they may be valuable where disseminated disease is considered in patients who are immunocompromised. It is true however that Mycobacteria (of several species)

have been incriminated in bowel disease. Culture is not the best technique available and should only be undertaken if the clinician fully understands the problems.

6. Tissue examination

   Skin, tissue e.g. curetting, lung, lymph node or post mortem specimens should be collected aseptically in an appropriate plain screw capped CE leak proof specimen container without preservatives and add sterile distilled water to prevent desiccation. A representative portion should be selected if possible: the majority of organisms will be found in the periphery of a caseous lesion. As large a sample as possible should be sent to the laboratory.


7. Gastric lavage / washings examination

   Gastric lavage / washings are usually taken instead of sputum where a patient is unable to expectorate e.g. for children where there are problems obtaining sputum. Ideally 3 early morning samples prior to food intake (before breakfast) are collected over 3 consecutive days. Preferably a minimum volume of 5ml should be provided. Aspirates should be promptly delivered to the laboratory to avoid acidic deterioration of organisms.

8. Sterile fluid examination e.g. CSF, pleural fluid, joint fluid, ascitic fluid

   Gross fluid production in these sites is abnormal. Where no microbiological or other underlying cause is proven, investigation for Mycobacteria may be appropriate. Collect aseptically as much CSF sample as possible into an appropriate plain screw capped CE leak proof specimen container. A minimum of 1ml of other fluids is required. If a small

volume is available after the initial lumbar puncture and the findings of cell counts and protein suggest TB meningitis, a second procedure should be considered to obtain a larger volume to improve the chance of achieving a positive culture.

9. Blood / bone marrow + blood samples
   Investigation for disseminated mycobacterial infection will be performed on selected patients only; usually immunocompromised, often HIV positive patients.

10. QuantiFERON/ T Spot test: Please refer to serology section for specimen details.

17.17 MRSA Screen

Pre-admission screens, admission screens and long-stay (ward) areas Nose and axilla using clear broths with white caps (see EKHUFT Infection Control Manual Section 2B: policy for the Management and Control of Meticillin Resistant *Staphylococcus aureus* (MRSA) and Appendix 5).

For wounds / skin lesions, and sites of invasive devices, charcoal swabs (black lid) must be used.

Catheter urine – add 1ml of catheter urine to MRSA screening broth (white cap).

GP Screens

We recommend using a routine charcoal swab (black lid) to collect a sample from the nose and axilla.
Routine screens should only be carried out according to protocols in the Infection Control Manual.

Staphylococcus aureus screen (renal unit)

We recommend collecting screening swabs from the nose and axilla, combining them into a staphylococcus screening broth (white cap) – see EKHUFT Infection Control Manual Section 2B: Policy for the Management and Control of Meticillin Resistant *Staphylococcus aureus* (MRSA) and Renal Medicine's Haemodialysis and peritoneal dialysis infection treatment and control guidelines.

17.18 Mycology samples

Submit:

- Hair plucked close to root (for scalp infection) and/or plastic sampling brushes available from large Pharmacies.
- Nail clippings (plain CE marked screw-capped specimen container). Clean the site using a 70% alcohol wipe, removing any varnish that may be present. Using a pair of sterile nail clippers, clip small samples from the edge of the nail, collect into a sterile pot labelled with the patient details. If the lesion is not at the edge of the nail it can be scraped with a sterile scalpel.

- Skin scrapings – Dermapak containers (available from Microbiology WHH). Clean the lesion of loose material, debris and any creams that may be present using a 70% alcohol wipe. Scrape the edge of the lesion with a sterile scalpel to remove loose skin scales and collect into a Dermapak container. If vesicles are present, remove the roofs with sterile scissors or scalpel and collect in the Dermapak container.

NB: Wound swabs are unsuitable for the diagnosis of dermatophyte fungi

PLEASE DO NOT STICK SAMPLES TO SLIDES WITH SELLOTAPE. IF NO DERMAPAK AVAILABLE PLEASE USE A SUITABLE CE MARKED SPECIMEN CONTAINER.

18 COLLECTION OF SAMPLE - VIROLOGY / SEROLOGY

If unclear which sample type is required for a test, please consult a Medical Microbiologist or the Senior BMS in Virology before collecting samples.

A virology diagnosis may be achieved by:

1. Serological methods including
   - Detection of specific IgG and IgM
   - Detection and quantification of antibody for immunity levels (titres)
   - Detection of viral antigen in blood e.g. Hepatitis B surface antigen
   - Detection of viral antigens in faeces e.g. Norovirus
2. Nucleic acid detection by qualitative methods (Respiratory and herpes group PCR) or quantitative methods (HIV, HCV, HBV and CMV viral load testing)

18.1 Blood samples for serology/virology.

The majority of serology/virology blood tests can be performed on serum (red top) specimens, SST (yellow top) specimens or EDTA (purple tops). For all PCR tests e.g. HCV Viral load an EDTA sample **MUST** be submitted.

It is often not possible to add tests on to samples from blood sciences due to short retention times and volume of sample used. Wherever possible it is preferable to send an independent sample for serological testing.

18.2 NPA (Nasopharyngeal aspirates) for RSV and PCR

NPA is the sample of choice for respiratory PCR on neonates and young children. Around 5 mls (if possible) should be collected into a conical bottom tube. Routine samples will be initially tested for RSV Antigen. If this is negative a full respiratory PCR will be performed.

Most cases of bronchiolitis are caused by RSV infection and can be rapidly diagnosed by performing an Antigen lateral flow test on a nasopharyngeal aspirate (NPA). Results can be available within 2 hours if requested urgently and thus can be used to influence whether ribavirin therapy is given.

18.3 Throat swabs in viral transport media (VTM) for PCR

Submit a nose and/or throat swab in VTM (clear fluid, green cap), available from microbiology on request, to look for respiratory viruses via PCR (as with NPA samples).

Samples are retained for 1 week after testing in case further viral studies are needed.

In cases of suspected flu outbreaks, please discuss with infection control or a consultant microbiologist prior to screening

18.4 Genital swabs (and others) for Herpes Simplex in VTM.

Swabs for HSV 1 + 2 testing should be taken in VTM (clear fluid, green cap).
If VZV or Enterovirus is required (i.e. vesicular rash,?hand foot and mouth) the sample will be sent to a reference laboratory for PCR.

18.5 Other swabs in VTM (eye swabs, skin swabs, vesicle swabs/fluid etc)

The relevant tests will be performed, dependant on the site of the swab and clinical details provided. Eye swabs will be tested for Adenovirus, HSV, Enterovirus and VZV, skin swabs will be tested for HSV, VZV and Enterovirus (if required).

18.6 CSF

All CSF samples tested by microbiology will then be triaged by the consultant microbiologists to decide if viral PCR is required. The transport and retention is described in section 17.2 of this document. In cases of raised WBC counts (>50 WBC seen) a Biofire film-array PCR test will be performed automatically to test for common causes of bacterial, viral and fungal meningitis. Further PCR tests and CSF's with low WBC counts will be tested at the Consultant Microbiologists' discretion.

Cryptococcal antigen testing can also be performed from CSF (or serum).

18.7 Urine for PCR (CMV)

Submit an MSU in a plain white-top universal to the lab, promptly after collection (red top urines cannot be used as the boric acid interferes with the PCR). A minimum of 1 ml is required and sent to a reference laboratory for testing.

18.8 Faeces samples for virology

Tests for Enterovirus, Adenovirus, Rotavirus, Norovirus, Astrovirus and Poliovirus can be performed from faeces. Adenovirus, Rotavirus and Norovirus are performed in-house via the enteric section. If further viral studies are required, the sample can be sent to the reference laboratory for investigation.

18.9 Salivary samples for Mumps testing

When mumps is suspected a salivary sample can be sent for Mumps PCR. This test is NOT carried out by the laboratory and arrangement must be made with the Kent PHE. Telephone 0344 225 3861 option 1 to arrange delivery of a collection kit and instructions.

18.10 Samples for Chlamydia, Gonorrhoea and HSV PCR testing.

Only use Abbott Alinity m swabs for any Chlamydia and/or Gonorrhoea testing. Any other swab types will **NOT** be tested.

Routine genital swabs for Chlamydia and/or Gonorrhoea and/or HSV1+2 PCR testing should be taken according to the instruction insert (see Appendix 6, 7, 8 & 10).

For chlamydial eye swabs first use a fine wire swab (e.g. ENT thin wire Charcoal swab with orange lid) to wipe the purulent discharge from the lower conjunctivae, this can then be sent for bacterial examination if required (NOT viral). Secondly, take an Abbott Alinity m swab collection kit and firmly wipe the now clean epithelium of the lower lid. Replace the swab into the container and send to the laboratory.

For urine samples please submit the sample in the Abbott Alinity m urine collection tube. Please see Appendix 9.

or

If this is not possible a clean white leak proof universal container may be used, but please do not submit urine in white top universals on Fridays.

18.11 QuantiFERON/ T spot samples for diagnosis of latent TB

QuantiFERON and T spot testing requires a strict coherence to the protocol:

1. Tests can be sent Monday to Friday inclusive, with the exception of Bank Holidays and the period between Christmas and New Year, when the reference laboratory facility is shut. Any variances from this will be communicated by Trust-wide email.

2. It is recommended that the case is discussed with a respiratory physician prior to requesting. The significance of both positive and negative results needs to be carefully assessed both in the light of clinical findings and the results of other investigations. Positive tests should be interpreted with caution in low risk populations. A negative result does not exclude active infection.

3. QuantiFERON and T Spot testing requires lithium heparin blood (green top tubes):

Adults and Children ≥10 years old (QuantiFERON): 1x 6ml or 2x 4ml tube (if insufficient is sent the sample will not be processed)
Children 2-9 years old: 2x 4ml tube

Children up to 2 years old (T SPOT): 2x 2ml paediatric tube

4. Specimens **MUST** be received by the WHH Microbiology laboratory by **4pm** on the same day the specimen is taken.

This is because:

a. the test is a timed test and specimens must be tested within **12 hours** of being taken.
b. the specimens need to be processed for booking onto the laboratory system and paediatric specimens for T SPOT need to be packaged for courier collection.

5. Deadlines for collecting samples to ensure they arrive in Microbiology by 16:00 are:

WHH: 15:00
K&C: 14:00 (to catch 14:15 transport van, which arrives at the WHH at 15:00)
QEQM: 13:30 (to catch 13:45 transport van, which arrives at the WHH at 14:55)

6. If there is an unavoidable delay in sending the lithium heparin tubes for receipt the same day, they may be stored at 2-8 °C for 16-48 hours, provided this is within 3 hours of collection.

7. Results will be available from 16:30, 2 days after the specimen is sent, e.g. if the specimen is sent on a Monday the results are available from 16:30 on Wednesday. Results for specimens received on a Thursday or Friday are available from 16:30 on the following Monday.

18.12 BAL/lower respiratory samples for Pneumocystis immunofluorescence.

If respiratory virus PCR is required from a BAL/sputum please make this clear on the request form, otherwise it will be processed for routine bacteriology.
Samples must be in sterile universals with no additives.
In cases where Pneumocystis infection is suspected a BAL sample is preferred. Sputum can be tested but the results are less well defined. The BAL can be tested after routine culture/TB testing as long as the need is clear on the request form. Pneumocystis can be detected via PCR or immunofluorescence (both via reference laboratory). Please discuss with a consultant microbiologist before requesting.

18.13 HIV Viral Load Monitoring (specialist test)

Submit 2 fresh EDTA (purple top) blood samples to the laboratory with details of all current anti-viral therapies and current CD4 count. The country of origin of HIV infections is useful to help exclude spurious low results caused by variant HIV strains.

18.14 HCV, HBV and CMV viral load monitoring

Submit a fresh EDTA blood to the laboratory (cannot be added onto other EDTA tests). These tests are batched and processed weekly, however if an urgent result is required, please contact the laboratory to arrange urgent testing.

18.15 Hepatitis

Serological tests

First line tests:

Hepatitis A IgM

Hepatitis B surface antigen

Hepatitis C virus

(Consider Hepatitis E if patient has high LFTs).

Second line Serology:

CMV

Toxoplasmosis

EB virus

Leptospirosis

Parvovirus

Specialist Hepatitis investigations by special arrangement with the laboratory.

Note: These tests are expensive and we reserve the right to decline requests if thought inappropriate by the Consultant Microbiologist. Hepatitis C testing should be in line with 'NICE' treatment guidelines.

18.16 Antenatal screening specimens

Microbiology Service offer an Antenatal Screening Service on serum (red top) or SST (yellow top) specimens. Please ensure patient consent is recorded on the request form

18.17 Summary table of sample collection for in-house tests:

Sample type	Pathogens investigated			Sample container
Blood	**In house:** HIV Syphilis CMV Rubella Toxoplasma Hepatitis A Hepatitis B Hepatitis C Hepatitis E HTLV EBV Parvovirus Mycoplasma VZV IgG Measles IgG Mumps IgG Lymes IgG	**Referred tests:** ASO titres Amoebic IFAT Anti Hyaluronidase Arbovirus antibodies Avian ppts BD glucan Candida ppts Coccidiomycosis Cystercercosis IFAT Entamoeba histolytica Electron microscopy Filaria Hepatitis D Abs HIB antibody Histoplasma Hydatid CFT Hydatid Elisa Intraconazole level Leishmaniasis Malaria IFAT Meningococcal C post vax level Farmers lung ppt Mumps IgM Measles IgM Netilmicin level Pertussis Ab level	Teicoplanin levels Rifampicin levels Itraconazole levels Posaconazole levels Pneumococcal abs Poliovirus ab Rabies ab level Rickettsial ab Brucella serology Campylobacter serology Cat scratch serology (Bartonella) Chlamydia serology HSV 1 serology HSV 2 serologyRicketsia Ab JCV serology Leptospira serology Lyme IgM serology Q fever SARS studies Schistosomal Elisa Strongyloides Elisa Toxocara abs Teicoplanin level Tetanus ab level Trichinella IFAT Toxocara Yersinia enterocolitica abs Yersinia Pseudo TB ab Isoniazid levels Ethambutol levels	Serum red top Vacutainer, SST yellow top Vacutainer,
Blood / serum/ BAL		Galactomannan ag		Serum red top Vacutainer, SST yellow top Vacutainer,

Sample type	Pathogens investigated		Sample container
Blood	**In house:** HIV1 viral load CMV viral load HCV viral load HBV viral load	**Referred tests:** Adenovirus PCR BK virus PCR CMV PCR (in conjunction with other tests) EBV PCR HCV and HBV Genotype HHV6 PCR Theraputic drug monitoring (HIV) HHV7 PCR HIV2 viral load HIV pro-viral DNA HLA testing HSV PCR Parvovirus PCR Polyomavirus PCR Anti-retrovirual resistance VZV PCR	EDTA purple top Vacutainer
NPA, Nose/throat swabs, BAL, sputum	**In-house:** RSV A + B Influenza A H Influenza B Mycoplasma pneumoniae Rhinovirus A/B/C Human Metapneumovirus Parainfluenza 1,2,3,4 Coronavirus OC43, 229E, NL63 Bocavirus 1/2/3/4 Enterovirus Adenovirus	**Referred tests:** MERS Coronavirus Pneumocystis PCR/ Immunofluoresence CMV Influenza typing	Sterile conical bottom universal, Sterile Universal VTM (green top swab) Sterile universal
Genital swabs	**In-house:** HSV	**Referred tests:** Syphilis Haemophilus ducreyii	VTM (green top swab)
Skin swab	**In-house:** HSV	**Referred test:** VZV Enterovirus	VTM (green top swab)
Eye swabs		**Referred tests:** Adenovirus, HSV, Enterovirus, VZV	VTM (green top swab)

Sample type	Pathogens investigated		Sample container
CSF	**In-house:** HSV 1+2 VZV, CMV, Enterovirus Parechovirus E.Coli K1, Haemophilus influenza Streptococcus pneumonia Streptococcus aggalactiae, Listeria monocytogenes, Neisseria meningitides Cryptococcus neoformans/gattii	**Referred tests:** EBV JC/BK virus 16S bacterial PCR 18s fungal PCR Whipples TB PCR fastrack	Sterile universal
Urine (not boric)	**Referred tests:** CMV		Sterile universal
Pericardial fluid	**Referred test:** Enterovirus, CMV, EBV, Adeno		Sterile universal
Faeces	**Referred test:** Enterovirus, CMV		Blue topped faeces collection pot

19 STORAGE OF COLLECTED SPECIMENS PRIOR TO TRANSFERRING TO THE LABORATORY

Exposure to significantly raised or reduced room temperatures may affect the results obtained during laboratory investigations. If the appropriate sample transport media or containers are used, samples for microbiological investigation should generally be stored in dry conditions at room temperature and not refrigerated. To ensure that results are clinically useful please store samples as shown in the table below:

Sample type	Storage conditions
Swabs	Store between 2-30˚C in dry conditions away from heat and out of direct sunlight. Transfer to the laboratory as soon as possible after collection.
Faeces	Store at ambient temperature in dry conditions away from heat and out of direct sunlight. Transfer to the laboratory as soon as possible after collection
Blood	
Aspirate, washings, pus, tissues, fluids	
Urine: Boric acid container (red cap) – DO NOT under or overfill – adhere to the fill lines on the side of the sample container (PHE, 2018).	Urine samples should be transferred to the laboratory as soon as possible after collection. Sample collected in a boric acid container should maintain the sample quality for up to 96 hours prior to processing at ambient temperature in dry conditions.
Non-boric acid container (white cap)	All urine sample collected in non-boric acid containers should be refrigerated to preserve sample quality.

20 REFERRING SAMPLES TO OTHER LABORATORIES

It may be necessary to refer samples to the reference laboratory for full identification of the samples which are not within the remit of this laboratory. The table below indicates which isolates need to be referred.

Serological tests referred to reference laboratories.

SEROLOGICAL TEST	REFERENCE LAB	SEROLOGICAL TEST	REFERENCE LAB	SEROLOGICAL TEST	REFERENCE LAB
Actinomyces	Molecular Identification Services Unit PHE Colindale	**Hepatitis B PCR(if not tested in house)**	Micropathology	**Pertussis**	Bacteriology Reference Department (RVPBRU) PHE Colindale
Adenovirus PCR	Micropathology	**Hepatitis C genotype**	Micropathology	**Polio**	Virus Reference Department PHE Colindale
Amoebic IFAT	Department of Parasitology HSL, The Halo, London	**Hepatitis C resistance testing**	Micropathology	**Pneumococcal Abs HIB Post Vax**	Oxford University Hospitals Trust Immunology Department Oxford
Arboviruses (includes West Nile, Dengue, Hantavirus, Flavivirus , Ross River Virus)	PHE RIPL (Diagnostics)	**Haemophilus influenzae B**	Immunology Laboratory Churchill Hospital Oxford	**Pneumococcal (Invasive disease)**	PHE Meningococcal Reference Unit Manchester
Aspergillus immunocap	Mycology Reference Centre Leeds	**Human Herpes Virus 6 PCR**	Micropathology	**Psittacosis**	PHE South West Bristol Laboratory
Avian immunocap	Mycology Reference Lab PHE South Wales	**Human Herpes Virus 7 PCR**	Micropathology	**Rabies**	Rabies Section Human Weybridge Vet Lab Surrey
BK Virus	Micropathology	**Human Herpes Virus 8 PCR**	Micropathology	**Rubella**	Virus Reference Department PHE Colindale

SEROLOGICAL TEST	REFERENCE LAB	SEROLOGICAL TEST	REFERENCE LAB	SEROLOGICAL TEST	REFERENCE LAB
Brucella	Virology Department Royal Liverpool and Broadgreen Hospital	**Histoplasma**	Molecular Pathology St James University Hospital Leeds	**Schistosoma**	The Department of Clinical Parasitology The Hospital for Tropical Diseases London
Candida precipitins	Mycology Ref Lab PHE South West	**HIV2 viral load**	Department of Virology University College London Hospitals NHS Foundation Trust	**Strongyloides**	The Department of Clinical Parasitology The Hospital for Tropical Diseases London
CMV PCR (only used if can't do in house)	Micropathology	**HIV pro-viral DNA**	PHE Colindale	**Syphilis**	Bacteria Reference Laboratory PHE Colindale
Coccidiomycosis	Mycology Reference Laboratory PHE South West	**HLA B*5701**	Cambridge Clinical Laboratories 184 Cambridge Science Park Cambridge	**Tetanus**	Immunology Laboratory Churchill Hospital Oxford
Cystercercosis IFAT	The Department of Clinical Parasitology The Hospital for Tropical Diseases London	**Hydatid**	Hydatid Reference Centre School of Tropical Medicine Liverpool	**Theraputic Drug Monitering**	Cambridge Clinical Laboratories 184 Cambridge Science Park Cambridge
Diphtheria	Immunology Laboratory Churchill Hospital Oxford	**Itraconazole Rifampicin Isoniazid Ethambutol**	PHE Bristol	**Teicoplanin**	Regional Antimicrobial Reference Laboratory Southmead Hospital Bristol

SEROLOGICAL TEST	REFERENCE LAB	SEROLOGICAL TEST	REFERENCE LAB	SEROLOGICAL TEST	REFERENCE LAB
EBV PCR	Micropathology	**JC Virus**	Micropathology	**Toxocara**	Department of Parasitology HSL, The Halo, London
EBVPCR ADENOVIRUS PCR (infant)	Virology Department Great Ormond St Hospital London	**Giardia IFAT**	Department of Parasitology HSL, The Halo, London	**Toxoplasma PCR**	Public Health Wales Microbiology ABM Singleton Hospital, Swansea
Electron Microscopy	PHE Colindale	**Leptospirosis**	PHE Microbiology Services Porton Down	**Typhus**	PHE Microbiology Services Porton Down, Salisbury
Entamoeba histolytica	Department of Parasitology HSL, The Halo, London	**Leishmaniasis**	The Department of Clinical Parasitology The Hospital for Tropical Diseases, London	**T-SPOT**	Oxford Diagnostic Laboratories Oxford
Enterovirus IgM	Microbiology Dept St Helier Hospital	**LYME Confirmation CSF/Serum**	PHE Microbiology Services Porton Down,	**Varicella Zoster IgM**	Microbiology Dept St Helier Hospital Surrey
Malarial Antibody	Department of Parasitology HSL, The Halo, London	**Measles IgG/M Mumps IgG/M**	PHE Colindale	**Viral PCR (CSF)**	Micropathology
Enterovirus PCR	Micropathology	**Parasitic Infections**	The Department of Clinical Parasitology The Hospital for Tropical Diseases London	**Viral Haemorrhagic Fever** (Ebola, Marburg, CCHF)	PHE Microbiology Services Porton Down, Salisbury
Filaria	Department of Parasitology HSL, The Halo, London	**Parvovirus B19**	Micropathology	**Varicella Zoster PCR**	Micropathology
Galactomannan	MRU Bristol	**Rickettsia**	PHE Microbiology Services Porton Down,	**Whipples**	Micropathology
Galactomannan screening	Micropathology	**Toxoplasma**	Public Health Wales Microbiology ABM Singleton Hospital, Swansea		

Bacteriological tests referred to reference laboratories.

Organism / Test	**Reference Lab**
Acanthamoeba culture	PHE Malaria Reference Laboratory & Diagnostic Parasitology Laboratory Faculty of Infectious & Tropical Disease, London School of Hygiene & Tropical Medicine
Antibiotic susceptibility testing	PHE Antimicrobial Resistance and Healthcare Associated Infections Unit (AMRHAI) Colindale
Bacillus spp (? Anthrax) *Listeria monocytogenes* *Helicobacter pylori*	PHE Gastrointestinal Bacteria Reference Unit (GBRU) Colindale
Fungal identification and susceptibility testing e.g. *Aspergillus fusaria*	Bristol MRU
Haemophilus influenza *S.pyogenes* Group A *Streptococcus pneumoniae*	PHE Respiratory & Vaccine Preventable Bacteria Reference Unit (RVPBRU) Whitechapel, London
Neisseria meningitidis	Meningococcal reference unit (Men RU) PHE Manchester

Other reference laboratories that may be used:

PHE National Mycobacterium Reference Laboratory (MR) Institute of Cell and Molecular Science, London	PHE South West Laboratory Mycology Reference Laboratory (MRL), Bristol
PHE Sexually Transmitted Bacteria Reference Unit (STBRU) Colindale	PHE Microbiology Services Rare and Imported Pathogens Laboratory (RIPL) Porton Down
PHE Molecular Identification Services Unit (MISU) Colindale	Public Health Wales Microbiology ABM Cryptosporidium Reference Unit (CRU) Swansea
PHE Meningococcal Reference Unit (MRU) Manchester Medical Microbiology Partnership (MMMP) Manchester	PHE Southampton

21 RESULTS

Enquiry terminals are available on all wards and in the A&E department giving access to the DART OCM electronic results service and, in some cases, directly to the laboratory computer system. Hard copies of reports are only issued if appropriate. Most bacteriology culture reports are issued within 2-5 days depending on the investigation. Serology and Virology turnaround times depend on the frequency that assays are performed and the urgency of the request. Most assays are performed at least once a week.

GP surgeries subscribing to the local PMIP/DART OCM initiative should receive electronic copies of all reports on samples originating from their surgery. Hard copies of reports are only issued if appropriate.

22 TELEPHONED RESULTS

Results of urgent requests and positive results that may influence patient management are telephoned to the requesting medical team; this includes all positive blood cultures and all CSF results.

23 REFERENCE LABORATORY RESULTS

Reports that contain results obtained from a third party reference laboratory will have the name of the referral laboratory clearly stated on the electronic and hard copies.

Please see section 20 for the names of the third party reference laboratories that may be used.

24 REPORTS

All results are electronically reported and the user can access them through the DART and PAS systems. Interim reports are issued for TB microscopy, Actinomyces investigation and where isolates are sent to reference laboratories for further identification. Final reports are issued when all the examinations are complete. Occasionally it may be necessary to amend a result and a further report clearly marked as amended will be issued; in these circumstances the user will be contacted by phone.

Reports contain the following information:

Patient details	Name, sex, DOB and hospital number, address, consultant/GP
Laboratory number	e.g. MR000111 Prefixed with M (for Microbiology) and another letter used to denote sample type e.g. R – respiratory sample, U – urine sample
Source	Name of hospital or GP
Ward/surgery	Name of ward or surgery
Sample type	e.g. Mid-stream Urine, Blood Culture

Result section includes:

The type of test	e.g. bacterial culture, microscopy & culture
Organism(s) isolated	
Sensitivity results:	S = Sensitive R = Resistant I = Intermediate (can be successfully treated if high doses of antibiotics are used)

Certain samples may have suppressed antibiotic sensitivity tests e.g. catheter urines, urine samples with leucocytes <50/mm^3 and leg ulcers. These can be available on request after consultation with a Medical Microbiologist.

Other information:

Authorised:	The name of the person who authorised the report.
Dates:	Collected, received and reported

25 INTERPRETATION OF RESULTS

Where appropriate laboratory reports will have interpretive comments added. The comments may be automatic, rule-based comments added by the laboratory computer system or individual comments added by the Biomedical Scientists or Consultant Microbiologists.

Biological reference intervals, reference ranges, clinical decision values, where applicable and the uncertainty of measurement associated with the microbiological examinations performed are available from the laboratory on request.

26 CLINICAL TESTS AVAILABLE AND TURNAROUND TIMES

Some specimens may be sent to reference laboratories for further confirmation / typing /grouping– see tables below:

Bacteriology Samples	Tests	Turn-around time	Comment
Urine	Routine Microscopy & Culture Negative urine	1 day	Urgent Microscopy 1hr
	Routine Microscopy & Culture Positive urine	3 days	
	Legionella and (pneumococcal antigen)	1 day	Urgent antigen 1hr (pneumococcal antigen request ONLY after discussion with consultant microbiologist)
	TB	up to 6 wks	
	Dysmorphic RBC	1 day	
MRSA broth screening (nose + axilla swabs)	Culture	2-3 days	Negative screen
		4 days	Positive screen
S.aureus Renal screening	Culture	2 days	Negative test
		2-3 days	Positive test
Ear swab	Culture	2-3 days	
Pus samples	Routine culture	1-6 days	
	Actinomyces/fungi	10 days	
Nose swab	Culture	2-3 days	generally used to check for staphylococcal carriage (including MRSA) and sometimes streptococcal and *C. diphtheria*
General wound swabs	Routine culture	2-6 days	Urgent microscopy 2hrs
	Anaerobic culture	Up to 6 days	
Throat swabs	Routine culture	1-3 days	for Beta haemolytic Streptococci
	Meningococcal	1-3 days	On advice of microbiologist
Genito urinary swabs	Vaginal swab	1-2 days	Useful for Gardnerella vaginalis, thrush and bacterial vulvovaginitis. Also Gp. B Strep. in pregnancy
	Endocervical swab (female) Urethral swabs (Male)	2-3 days	Useful for Chlamydia and Gonococcus. A special swab and transport medium are needed for Chlamydia
	Urethral swabs (Female)	2-3 days	May also be examined for Chlamydia but are not recommended because collection of the SAMPLE is uncomfortable
	Rectal swab	2-3 days	May be examined for chlamydia and/or gonococcus. A special transport medium is needed for Chlamydia
Pernasal swab	for Bordetella pertussis	5 days	A thin wire swab must be passed along the floor of the nasal passage until the resistance of the soft palate is met.

Bacteriology Samples	Tests	Turn-around time	Comment
Sputum	Routine Microscopy & Culture	2-3 days	
	AFB microscopy	2-3 days	
	AFB culture	4-6 weeks	Referred test Fast Track PCR available for TB and Rif. Resistance on serum samples
	Bronchial washings (and induced sputum)		All samples undergo routine bacteriology. Virology, microscopy for PCP and TB examination are optional
Faeces/stools	C.difficile GDH/Toxin studies	1-2 days	Repeat specimens from patients with previous positive toxin results should not be tested within 28 days of initial diagnosis, unless clinical details indicate a relapse of infection.
	Culture	3-5 days	Salmonella, Campylobacter, E coli O157 and Cryptosporidium.
	Rota/Adeno virus	1-3 days	Children <12 years old
	Norovirus (SRSV)	1-3 days	Only requested in outbreak situations
	Microscopy (for ova & parasites)	1-3 days	Available on request. Full travel history must be provided
	Cryptosporidium / Giardia antigen testing	3 days	
Tissue and sterile fluids	Culture	3-10 days	
Blood culture	Aerobic & Anaerobic	1-7 days	14 days for infective endocarditis
CSF	Microscopy & culture	1-3 days	Microscopy 2hrs
	DNA amplification screen (PCR)	7-14 days	Also available on EDTA blood SAMPLE
Skin scrapings	Mycology microscopy and culture	1-8 weeks	Microscopy is available after 2 days
Any specimen type (preferably from sterile site)	16s rRNA bacterial gene detection/sequencing	5 days	Referred test
Any specimen type (preferably from sterile site)	Pan fungal (18s) DNA detection/sequencing	6 days	Referred test
Faeces, urine and other specimen types	Parasite identification	14 days	Referred test

Non-viral Serology	Tests	Turn-around time	Comments
Amoebic inf.	Amoebic IFAT	10-15 days	Referred test
Antenatal screening	Syphilis	8 working days	
Aspergillosis	Aspergillus precip's	10 days	Not suitable for diagnosis of invasive disease. Referred test
ASOT	Antistreptolysin O	7-10 days	Referred test
Avian precipitins	Budgie, fowl and pigeon	14 days	Referred test
Brucellosis	Br.abortus & melitensis microagg	14 days	Exposure history must be provided. Brucellosis is no longer endemic in the UK Referred test
Candida	Candida antigen	5-10 days	Discuss with microbiologist Referred test
Cat scratch disease (Bartonella henselae)	Antibodies	10-15 days	Referred test – only available on agreement with a Consultant Microbiologist as no referral laboratory within UK.
Chlamydia pneumonia /psittacosis	Chlamydial serology	10 days	The Psittacosis CFT is used to screen for both C pneumoniae and C psittaci. Referred test
Cryptococcal antigen		2 working days	
Filariasis	Filaria Elisa	1-5 days	Exposure history must be provided Referred test
Helicobacter antigen	Elisa – Enteric laboratory	3-7 days	Not suitable for monitoring treatment. Indicates exposure to infection at some time **Faecal sample only**
Hydatid	Hydatid ELISA	14 days	clinical information essential Referred test
Leptospirosis	Leptospira IgM/ELISA	7 days	24-48 hr result if urgent. Referred test
Lyme disease	IgG Western blot	4 days 9 days	Exposure history must be provided Referred test
Malaria	Malaria IFAT	7 days	Blood film examination is preferred investigation. Antibody detection is rarely helpful. EDTA to Blood Sciences
Meningococcal meningitis	Meningococcal PCR	3 days	Referred tests
	Meningococcal typing	7-10 days	
	Meningococcal antibodies	28 days	
Mycobacteria	Interferon gamma release assay (T-Spot)	3 working days	Referred test – samples submitted on Thursday or Friday reported on Monday.
Mycoplasma sp	Mycoplasma pneumoniae IgM	7 days	Test run once each week on Wednesdays
	PCR	3 days	Referred test

Non-viral Serology	Tests	Turn-around time	Comments
Pertussis serology		7 working days	Referred test
Q fever	Q fever serology	5-10 days	Referred test
Rickettsial or Arbovirus infection	Arbovirus and Rickettsial antibody	14 days	travel history required Referred test
Schistosomiasis	Schistosomal ELISA	14 days	travel history required
Strongyloidiasis	Strongyloides ELISA	14 days	travel history required + clinical details Referred test
Toxocara		14 days	Referred test
Toxoplasmosis	IgG, IgM, Confirmation Dye test PCR	14days	In the case of pregnancy contact, please contact Microbiology to arrange same day testing
Syphilis	Antibodies RPR, TPPA and IgM PCR	2 days 8 days 3 days	In-house test for IgG/IgM combined. In-house test for RPR and TPHA for confirmation and infection stage. IgM testing is a referred test Referred test
Vaccine screen	Haemophilus, pneumococcus, tetanus antibodies	9 days	Referred test
Antimicrobial therapeutic drug monitoring		10 days	Referred test
Fungal serology including Galactomannan and B-D-Glucan		10 days	Referred test

Virology	Tests	Turn-around time	Comment
Antenatal Screening	Hepatitis B HIV	8 working days	
BK Virus	Molecular detection	5 days	Referred test
Campylobacter	Serology	14 days	Referred test

Virology	Tests	Turn-around time	Comment
Cytomegalovirus	IgG IgM Avidity load Viral load	3 days 7 days	Screens for immunity or recent infection available. CMV viral load (EDTA) can be estimated by PCR and is indicated for routine follow up of BMT patients and in selected immunosuppressed patients by arrangement with microbiologist
EB virus	EBV nuclear IgG, EBV capsid IgM PCR	4 days 3 days	Can determine a current, recent or historic infection Referred test
Enterovirus RNA	Coxsackievirus, Enterovirus, Echovirus	7 days	Referred test
Herpes simplex 1 &2	Serology not routinely available.	4 days	PCR is preferred diagnostic method. Can be sent in a VTM tube.
Herpes simplex 1 &2	Serology		Referred test
Hepatitis A	IgM and total antibody (IgG/IgM) for immunity	3 days	Indicates recent infection or immunisation
Hepatitis B	HBsAg HBeAg anti-HBs anti-HBe anti-HBc anti-HBc IgM Hep B viral load	3 days 3 days 3 days 3 days 3 days 3 days 7 days	4hrs if urgent +ve = Hepatitis B carrier high level carrier Immunity to Hepatitis B (vaccine or past infection) low level carrier (if present with HBsAg) past or current Hepatitis B (not vaccine response) Suggests recent infection In-house test
	HBV Genotype	14 days	Referred test
Hepatitis C	Anti-HCV. Hepatitis C viral load, Hepatitis C Ag/Ab	3 days if negative	Initial screen for Hepatitis C antibody, if positive, viral load is performed from the same sample
	Resistance testing	5 days	Referred test
	HCV Genotype	7 days	Referred test
Hepatitis D		14 days	Referred test
Hepatitis E	IgG IgM	4 days	Test run daily where possible
	RNA	7 days	Referred test
HIV	1+ 2 Ag/Ab Combo HIV typing HIV viral load	3 days 7 days	If positive a repeat sample for confirmation of patient ID 2 x EDTA blood samples for viral load will be required
HTLV	1 & 2 antibodies	3 days	

Virology	Tests	Turn-around time	Comment
Human Herpes Virus (HHV) 6/7	In vesicles / skin lesions (swabs in VTM)	7 days	Referred test
Human Herpes Virus (HHV) 6/7/8	DNA in blood	7 days	Referred test
Influenza	Typing	30 days	Referred test
Measles	IgG	4 days	IgG performed in-house
	IgM	10-15 days	IgM is a referred test, please provide contact symptoms and treatment information if requesting IgM testing
Mumps	IgG	4 days	IgG performed in-house
	IgM	10-15 days	IgM is a referred test, please provide contact symptoms and treatment information if requesting IgM testing
Rubella	IgG and IgM	3 days	
Parvovirus	IgG and IgM	7 days	Test run weekly, more frequent if urgent samples
	PCR	15 days	PCR is carried out on IgM positive samples if clinically required – Referred test
Varicella Zoster	IgG	4 days (same day possible if urgent)	In cases of pregnancy contact, please contact Microbiology to arrange same day testing (needed for administering VZIG).

Virus investigations	Tests	Turn-around time	Comment
Throat swab in VTM for PCR	Adenovirus	1-3 days	All viruses tested as routine
	Bocavirus	1-3 days	
	Corona viruses	1-3 days	
	Enterovirus	1-3 days	
	Human Metapneumo virus	1-3 days	
	Influenzavirus A & B	1-3 days	
	Parainfluenza 1-4	1-3 days	
	Rhinovirus	1-3 days	
	RSV A +B	1-3 days	
Nasopharyngeal aspirate (NPA)	Adenovirus	1-3 days	All viruses tested as routine on RSV negative samples or by special request
	Bocavirus	1-3 days	
	Corona viruses	1-3 days	
	Enterovirus	1-3 days	
	Human Metapneumo virus	1-3 days	
	Influenzavirus A & B	1-3 days	
	Parainfluenza 1-4	1-3 days	
	Rhinovirus	1-3 days	
	Respiratory syncytial virus (RSV) in babies	24 hours	Rapid test for RSV antigen performed before full PCR. PCR will not be performed on positive samples unless requested.
CSF	Enterovirus	5 days	Referred test, please discuss with Consultant Microbiologist if required
	Parechovirus	5 days	In-house test
	VZ virus	5 days	In-house test
	Herpes simplex 1 and 2 antibody PCR	5 days	Referred test
	CMV PCR	5 days	Referred test
	EBV, Adenovirus PCR	5 days	Referred test
Vesicles/ skin lesions (swabs in VTM)	Herpes simplex	2-4 days	Swabs in VTM taken from ulcerated genital and non-genital lesions give good results. Dry lesions need to be scraped to expose the base of ulcer.
	Enterovirus	5 days	Referred test
	Varicella zoster	5 days	Virus is in cells lining vesicle rather than vesicle fluid.
CMV PCR (Urine)	CMV	2-5 days	In plain white top universal **not** boric acid Referred test

CT & GC PCR	Tests	Turn-around time	Comment
Chlamydia trachomatis and Neisseria gonorrhoea investigation **Please use Abbott Alinity m multi-collect specimen collection kits only**			
Urine	PCR	1-5 days	Decant into urine collection tube in the Abbott Alinity m multi-collection specimen collection kit as soon as the sample is taken. If no Alinity m urine collection tubes are available, please ensure that the sample reaches Microbiology the same day the sample was taken.
Urethral swab			Abbott Alinity m multi-collect specimen collection kit
Cervical swab			
Other sites including eye, rectal and throat			Samples from these other sites are tested, but please note that they have not been validated on the Alinity m instrument used to process samples.

If any test is urgent, please contact Microbiology.

If a test is required that is not listed above, please contact Microbiology and we will endeavour to identify a laboratory that is able to perform the examination.

27 REFERENCES

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28 APPENDICES

28.1 Appendix 1 - Vacuette selection chart

Refer to East Kent Hospitals University Foundation Trust Venepuncture Policy on Policy Centre

East Kent Hospitals University NHS

VACUETTE® SELECTION CHART

Blood Culture First. Aerobic followed by Anaerobic.
If insufficient blood for both culture bottles, use aerobic bottle only.

Blood must be taken in the following order

VACUETTE®

	Item Number	Volume	Cap Colour	Tube Contents	Tests	Special Instructions
1		10ml		Blood Culture	All personnel undertaking blood culture collection must complete the trusts e learning package.	**Important Points:** *Disinfect skin with Chloraprep Frepp *Complete the yellow label in the blood culture pack and place in the patient's notes
2	454334	3ml	Blue	Trisodium Citrate	**Haematology:** Clotting Studies / INR	Additional tubes will be required for the investigation of coagulation disorders.
3	456089	6ml	Red	Clot Activator	**Clinical Biochemistry:** Theraputic Drugs, Cryoglobulins, Downs Screening, PIIINP and Thyroglobulin and Thyroglobulin Ab's, Digoxin. Trace Elements - Refer to lab. **Microbiology:** Serology Investigations & Antibiotic Assays.	**Clinical Biochemistry:** For Cryoglobulins contact the Department of Laboratory Medicine prior to collection.
4	454228	4ml	Gold	Clot Activator and Separation Gel	**Clinical Biochemistry:** All General Tests, Protein Investigations, Thyroid Function Test, FSH, LH, Prolactin, Oestradiol, Progesterone, Cortisol, Testosterone, hGH, B12, Folate, Ferritin, C3, C4, IgE, Autoimmune Antibody Studies, Rheumatoid Factor, Tumour Markers.	
5	454029	4ml	Green	Lithium Heparin	**Clinical Biochemistry:** Amino Acids, Carboxyhaemoglobin, Chromosomes, White Cell Enzymes and Insulin. Haematology: Osmotic Fragility.	
6	454209	4ml	Lavender	EDTA	**Haematology:** FBC, ESR's, Glandular Fever, Hb Electrophoresis, Sickle Screen, Blood Parasites, Rell Cell Enzymes, Leucocyte Immunophenotyping, Leukaemia Marker, Plasma Viscosity, Retics, PCR. Clinical Biochemistry: Ammonia, HbA1C, Lead, Tacrolimus, Ciclosporin, PTH, BNP, TPMT & Blood Porphyrins. **Microbiology:** PCR.	**Clinical Biochemistry:** For Ammonia and Porphyrins contact the Department of Laboratory Medicine.
7	456242	6ml	Pink	EDTA	**Blood Transfusion:** All Blood Group Serology & Cross Matching.	
8	454238	2ml	Grey	NaFl Oxalate	**Clinical Biochemistry:** Glucose, Alcohol, Lactate.	

IMPORTANT: Hold tube in place with the thumb until filled to the required level

Gently Invert All Tubes 8 – 10 Times

For further copies of this guide and questions regarding specific tests, please contact the Department of Laboratory Medicine.

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www.gbo.com/preanalytics VAEK02 VERSION 2. Last updated July 2011

28.2 Appendix 2 – Paediatric vacuette selection chart

East Kent Hospitals University NHS

Paediatric SELECTION CHART

Blood Culture First

Blood must be taken in the following order

VACUETTE®

	Item Number	Volume	Cap Colour	Tube Contents	Tests	Special Instructions
1		4 ml		Blood Culture		
2	459075	1.3 ml	Blue	Trisodium Citrate	**Haematology:** Clotting Studies / INR	Additional tubes will be required for the investigation of coagulation disorders.
3	459092	1.3 ml	Red	Clot Activator	**Clinical Biochemistry:** Theraputic Drugs, Cryoglobulins, Downs Screening, PIIINP and Thyroglobulin and Thyroglobulin Ab's, Digoxin. Trace Elements - Refer to lab. **Microbiology:** Serology Investigations & Antibiotic Assays.	**Clinical Biochemistry:** For Cryoglobulins contact the Department of Laboratory Medicine prior to collection.
4	459071	1.3 ml	Yellow	Clot Activator and Separation Gel	**Clinical Biochemistry:** All General Tests, Protein Investigations, Thyroid Function Test, FSH, LH, Prolactin, Oestradiol, Progesterone, Cortisol, Testosterone, hGH, B12, Folate, Ferritin, C3, C4, IgE, Autoimmune Antibody Studies, Rheumatoid Factor, Tumour Markers.	
5	459084	1.3 ml	Green	Lithium Heparin	**Clinical Biochemistry:** Amino Acids, Carboxyhaemoglobin, Chromosomes, White Cell Enzymes and Insulin. Haematology: Osmotic Fragility.	
6	459036	1.3 ml	Lavender	EDTA	**Haematology:** FBC, ESR's, Glandular Fever, Hb Electrophoresis, Sickle Screen, Blood Parasites, Rell Cell Enzymes, Leucocyte Immunophenotyping, Leukaemia Marker, Plasma Viscosity, Retics, PCR. Clinical Biochemistry: Ammonia, HbA1C, Lead, Tacrolimus, Ciclosporin, PTH, BNP, TPMT & Blood Porphyrins. **Microbiology:** PCR.	**Clinical Biochemistry:** For Ammonia and Porphyrins contact the Department of Laboratory Medicine.
7	456242	6 ml	Pink	EDTA	**Blood Transfusion:** All Blood Group Serology & Cross Matching.	
8	459085	1.3 ml	Grey	NaFl Oxalate	**Clinical Biochemistry:** Glucose, Alcohol, Lactate.	

Gently Invert All Tubes 8 – 10 Times

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VAEK04 VERSION 2. Last updated July 2011

28.3 Appendix 3 – Collection of urine samples

a) Mid-stream urine

http://www.ekhuft.nhs.uk/patients-and-visitors/information-for-patients/patient-information-leaflets/?entryid103=409668&catid=6483

NHS
East Kent
Hospitals University
NHS Foundation Trust

The Collection of a random urine sample

Information for patients from the Department of Laboratory Medicine

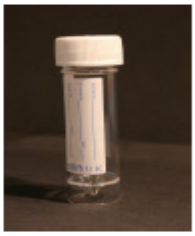
Why do I have to collect this sample?
Your GP, or another healthcare professional, may ask you to collect a random urine sample to help them diagnose a health condition, or to rule one out.

This may be to look for bacteria if you have an infection or it may be to measure some of the waste products that are filtered out of your body into your urine, through your kidneys.

If your urine contains anything unusual this may be because you have an underlying health problem.

What should I do before I collect my sample?
Please read and follow all the instructions you are given before collecting your sample.

Your doctor or nurse will give you a sterile container for the sample (see photo). Please make sure that you label this container with your first name, surname, and date of birth using a biro (if not already completed by your healthcare professional). If you know your NHS number, then please also write this on the container.



If you are given a sample container with a red top (see photo) you will also be given a small, disposable cup. This cup is used to catch your urine and then transfer it to the red-top tube.

We care

1 of 3 The Collection of a random urine sample (March 2020)

What is the powder already in the container?

White-top containers do not contain any powder.

Red-top containers contain a small amount of boric acid powder - do not discard! The boric acid is important and makes sure that the urine is suitable for testing for bacteria. Avoid skin contact and do not eat. Keep the container out of the reach of children!

- If you accidentally get the powder on your skin immediately wash the area with plenty of water.
- If you accidentally get the powder in your eyes immediately rinse them with plenty of water, and go to your nearest accident and emergency (A&E) department as soon as possible.
- If the powder is taken internally (swallowed, inhaled) go to your nearest A&E immediately.

How do I collect my sample?

Your doctor will often ask you to collect an early morning sample, although urine collected at other times of day is acceptable for some tests. An early morning sample is the first sample you pass after waking in the morning, this is the urine that has collected in your bladder overnight.

Unless otherwise advised by your doctor, please follow the procedure below.

- If possible wash between your legs (and your penis if you are a man) with soap and water. Do not use an anti-bacterial wet wipe.
- Wash your hands. Remove the lid of the sample container and set it aside. Do not touch the inside of the lid, the rim, or the inside of the container, as this will cause contamination with the bacteria that is normally found on your skin.
- Start to urinate into the toilet without collecting the first part of the urine that comes out.
- Midway through passing urine move the container into the stream of urine and fill the container about one half to two-thirds full. For a red-top tube containing boric acid powder, catch the urine in the small disposable cup and then transfer the urine to the tube which should be filled to the fill line on the label.
- You may finish urinating into the toilet until your bladder is empty.
- Put on the specimen container lid and screw on tightly. If the outside of the container has got dirty clean the outside with soap and warm water.
- Rinse the disposable plastic cup before throwing it away.
- Wash your hands thoroughly with soap and warm running water and dry.
- Write the date and time on the specimen container. Place the specimen container in the plastic bag attached to the laboratory request form and make sure that the bag is properly sealed.

What do I do with the sample when I have finished?

- Make sure the lid is done up tightly and the details on the label are filled in.
- Take the sample and the test request form to your GP surgery or to the pathology laboratory at your nearest East Kent Hospital as soon as possible. If it is impossible to deliver the sample on the same day, keep it somewhere dry and away from heat. Do not refrigerate.
- Samples can be taken to pathology at the William Harvey Hospital (WHH), Ashford, Kent and Canterbury Hospital (K&C), or Queen Elizabeth the Queen Mother Hospital (QEQM), Margate, between 8.30 am and 7.30 pm, Monday to Friday.

Please follow these instructions carefully. Failure to do so will make it difficult for your doctor to interpret the results and you may have to do it again.

Who do I tell if I have got a problem?

New specimen containers are available from the pathology laboratories at the WHH, K&C, QEQM, or from your GP surgery. Please discuss any problems with sample collection with your healthcare professional.

How will I find out my results?

Your test results will be sent back to the doctor who requested the test. Most results will be available within a week but some may take up to six weeks.

Where can I get further information?

- If you have any further queries about why this test is being done, please speak to the doctor or healthcare professional who requested your test.
- If you have practical questions about your sample collection, please phone the Duty Biochemist on 01233 616287. Laboratory staff cannot discuss your results.

This leaflet has been produced with and for patients

If you would like this information in **another language, audio, Braille, Easy Read, or large print** please ask a member of staff.

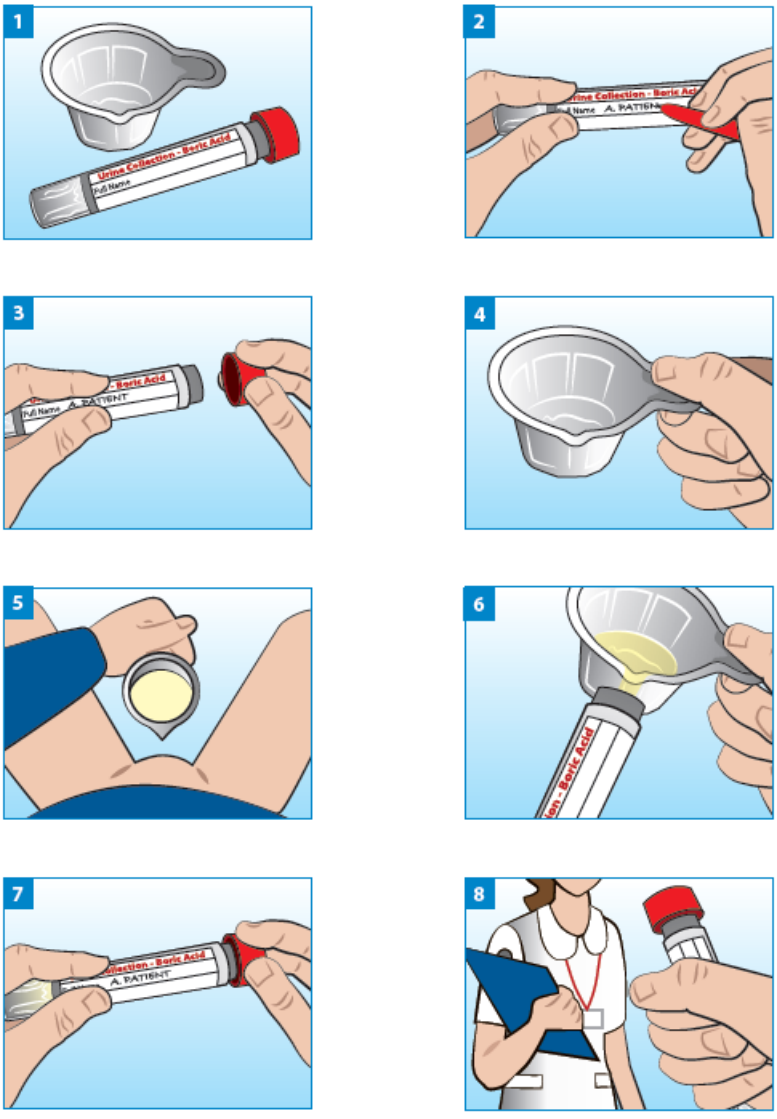
Any complaints, comments, concerns, or compliments please speak to your doctor or nurse, or contact the Patient Advice and Liaison Service (PALS) on 01227 783145 or email ekh-tr.pals@nhs.net

Further patient leaflets are available via the East Kent Hospitals web site www.ekhuft.nhs.uk/patientinformation

Information produced by the Department of Laboratory Medicine
Date reviewed: March 2020 Next review date: July 2022 Web 288

Urine Collection Instructions

East Kent Hospitals University NHS
NHS Foundation Trust



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G + N Laboratory
Email: sales@gandn.com Website: www.gandn.com

b) Urine collection pads:

Remove the infant's nappy and clean the perineum or prepuce with soap and water. Do not apply any creams.
Place the urine collection pad across vulva or penis in a lengthwise fashion.
Remove the adhesive backing from the pad and secure to the nappy.
Change urine collection pad every 30-45 minutes and also when the child has passed a stool, to reduce the risk of contamination with skin or faecal flora.
When the infant has passed urine, remove the nappy with the urine collection pad in it.
Lay the pad down wet side up on an appropriate clean surface.
Take sterile 5 ml syringe and place the tip on the pad and extract the urine by pulling up the plunger and empty the syringe into an appropriate clean CE marked container.
Repeat this process until the required amount of urine has been obtained.

c) Urine collection bags:

Select the correct size sterile urine bag to avoid leakage or contamination with faeces.
Remove the infant's nappy and clean the perineum or prepuce with soap and water, dry the area thoroughly and do not apply any creams.
Remove the protective backing from the bag, and follow the following procedure:
For females, place the bag over the vulva, starting from the perineum and work upwards, pressing the adhesive to perineum and symphysis.
For male, insert penis and scrotum into the opening of the bag and press adhesive to perineum and symphysis.
Cut a hole in the nappy and pull the urine bag through the opening.
When the infant has passed urine, perform the hand hygiene procedures before putting on disposable gloves and removing the bag.
Maintain a good aseptic technique whilst holding the bag over a suitable clean urine specimen container and cut off the tip of the bottom corner of the bag using clean scissors and empty the urine into an appropriate clean CE marked container.
Wash the infant's genitalia after the procedure to prevent soreness of the skin.

d) Suprapubic aspirate

Collection of urine by a supra-pubic aspirate should be considered when a sterile sample is required. Ultrasound guidance should be used to indicate the presence of urine in the bladder before a suprapubic aspirate is attempted (NICE, 2007).

e) Catheter specimen

Catheter samples must be collected from the self-sealing valve of the urinary drainage tubing. Do not disconnect the closed drainage system as infection may be introduced (DH 2001). Similarly do not take the sample from the urinary drainage bag as the specimen may be contaminated.

Using an aseptic non-touch technique, clean the catheter sampling site with 2% chlorhexidine/70% alcohol wipe (eg Clinell®) and allow to dry.
Use a sterile syringe and needle to access the self-sealing valve, insert the needle into the valve at an angle of 45 degrees; this will minimise penetration of the wall of the tubing and subsequent needle stick injury.
Gently pull the syringe plunger out to transfer the urine into the syringe.
Remove the needle and syringe, wipe the area with the alcohol swab and allow to dry (the valve will self-seal) and transfer the urine into an appropriate clean CE marked container.
Discard the needle and syringe into a sharps container.

28.4 Appendix 4 – Collection of a faecal sample

http://www.ekhuft.nhs.uk/patients-and-visitors/information-for-patients/patient-information-leaflets/?entryid103=409665&catid=6483

NHS
East Kent
Hospitals University
NHS Foundation Trust

The Collection of a stool (faeces) sample

Information for patients from the Department of Laboratory Medicine

Why do I have to collect this sample?

Your GP or another healthcare professional may ask you to collect a stool sample to help them diagnose a health condition or to rule one out. Stools contain bacteria and other substances that are present in the digestive system. By measuring the amounts of these substances and identifying bacteria in your stools, healthcare professionals can work out whether there are problems in your digestive system.

What should I do before I collect my sample?

Please read and follow all the instructions you are given before collecting your sample.

Your doctor or nurse will give you a sterile blue container for your sample (see photo). Please make sure that you label this with your first name, surname, and date of birth using a biro (if not already completed by your healthcare professional). If you know your NHS number, then please also write this on the container.

You will also need a clean, dry, wide-mouth container (for example an empty plastic food container or a potty) or some plastic wrap and some clean newspaper, a bin bag, and soap and water.

We care

1 of 3

The Collection of a stool (faeces) sample (March 2020)

How do I collect my sample?

- Place the plastic container or potty in the toilet bowl. Alternatively, place clean newspaper or plastic wrap across the toilet seat opening (if the stool is very watery this may not be possible).
- Pass the stool into the potty, plastic container, or onto the newspaper or plastic wrap. Make sure it does not touch the inside of the toilet.
- Transfer small scoopfuls of the stool into the blue specimen container using the spoon built into the lid of the specimen container. Try to make sure that any parts of the stool which look bloody, slimy, or watery are put in the specimen container as well as some solid material. If possible try not to mix urine with the stool sample – do not worry if this is not possible.
- Do not overfill the specimen container. A walnut-sized amount, or a third of the container, is enough for testing.
- Put on the specimen container lid and screw on tightly. If the outside of the container has got dirty, clean the outside with soap and warm water.
- Wash your hands thoroughly with soap and warm running water, then dry them.
- Flush the stool left in the potty, plastic container, newspaper, or plastic wrap down the toilet. If you have used newspaper, plastic wrap, or a disposable plastic container wrap them up in newspaper and then tie in a bin bag to go in your outside bin. If you have used a potty clean it with your usual toilet cleaner. Make sure the potty is clean and dry before you use it again.
- Write the date and time on the specimen container. Place the specimen container in the plastic bag attached to the laboratory request form and make sure that the bag is properly sealed.
- Wash your hands thoroughly with soap and warm running water, then dry them.

What do I do with the sample when I have finished?

- Make sure the lid is done up tightly and the details on the label are filled in.
- Take the sample and the test request form to your GP surgery or to the pathology laboratory at your nearest East Kent Hospital as soon as possible. If it is impossible to deliver the sample on the same day, keep it somewhere dry and away from heat or direct sunlight. Do not refrigerate.
- Samples can be taken to pathology at the William Harvey Hospital (WHH), Ashford, Kent and Canterbury Hospital (K&C), or Queen Elizabeth the Queen Mother Hospital (QEQM), Margate, between 8.30 am and 7.30 pm, Monday to Friday.

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New specimen containers are available from the pathology laboratories at WHH, K&C, QEQM, or from your GP surgery. Please discuss any problems with sample collection with your healthcare professional.

How will I find out my results?

The results of your test will be sent back to the doctor who requested the test. Most results will be available within one to two weeks but some may take up to six weeks.

Where can I get further information?

- If you have any further queries about why this test is being done, please speak to the doctor who requested your test.
- If you have practical questions about your sample collection, please phone the Duty Biochemist on 01233 616287. Laboratory staff cannot discuss your results.

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Information produced by the Department of Laboratory Medicine
Date reviewed: March 2020 Next review date: July 2022 Web 287

28.5 Appendix 5 – Procedure for using the new Transwab duo pack for MRSA specimens

East Kent Hospitals University NHS
NHS Foundation Trust

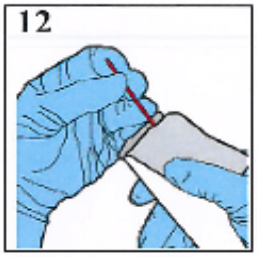
PROCEDURE FOR USING THE NEW SIGMA-TRANSWAB® DUO PACK FOR MRSA SPECIMENS

All MRSA admission screens:

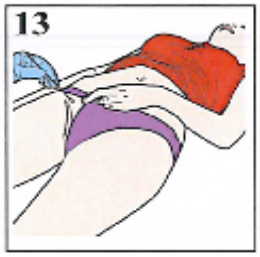
- Patients attending the Pre-Assessment Clinics
- MRSA follow-up screens
- Long stay/ward screens

Body sites – Nose and groin only (not axillae)
NB If there are any additional sites to be screened (i.e. leg ulcers, wounds, etc), charcoal swabs must be used.

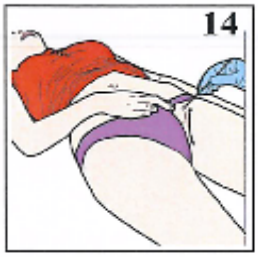
PROCEDURE FOR MRSA SPECIMEN COLLECTION USING SIGMA TRANSWAB DUO PACK



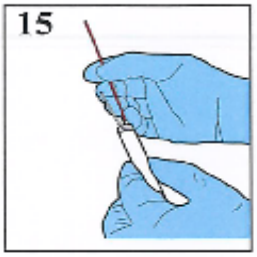
Remove red shaft swab from pack



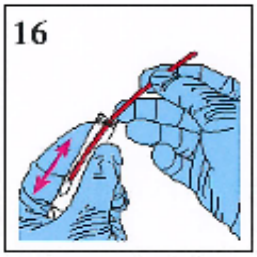
Swab along right groin rubbing from front to back 2-3 times



Repeat for left groin



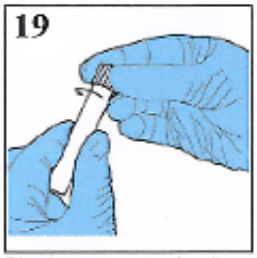
Place swab fully into tube



Rub/squeeze bud of **RED** shaft swab against the inside of tube

REMOVE THE **RED** shaft swab from the tube AND DISCARD

Tube now contains ONLY the white swab



Firmly screw cap back onto tube.
Fill in patients details and send to laboratory

20 Discard gloves in clincal waste bin

21 Decontaminate hands by using alcohol handrub or washing hands

mwe medical wire
www.mwe.co.uk

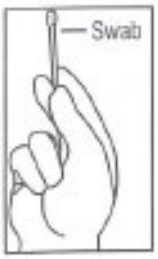
Putting patients first

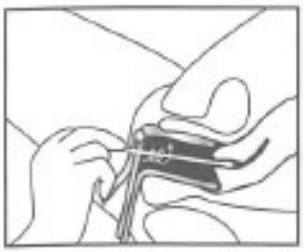
EK 080517

28.6 Appendix 6 - Abbott Alinity m endocervical swab specimen collection guide

Endocervical Swab Specimen Collection

CAUTION: Do NOT expose swab to Transport Buffer prior to collection.



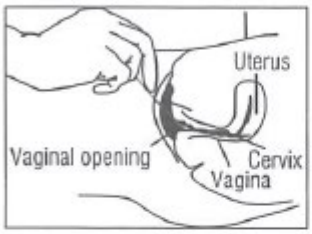


1. Discard disposable transfer pipette; it is not required for endocervical swab specimen collection.
2. Remove the sterile swab from the wrapper, taking care not to touch swab tip or lay it down on any surface.
3. Insert only the white tip of the specimen collection swab into the endocervix canal.
4. Gently rotate the swab for 15 to 30 seconds to ensure adequate sampling.
5. Withdraw the swab carefully.
6. Handle the cap and tube carefully to avoid contamination, including the outside of the transport tube and cap. If necessary, change gloves.
7. Unscrew the transport tube cap and immediately place the specimen collection swab into the transport tube so that the white tip is down.
8. Carefully break the swab at the scored line on the shaft; use care to avoid splashing of contents.
9. Recap the transport tube. Ensure the cap seals tightly.
10. Label the transport tube with sample identification information, including date of collection using an adhesive label.

28.7 Appendix 7 – Abbott Alinity m Clinician-Collected vaginal Swab Specimen Collection Guide

Clinician-Collected Vaginal Swab Specimen Collection

CAUTION: Do NOT expose swab to Transport Buffer prior to collection.



1. Discard disposable transfer pipette; it is not required for vaginal swab specimen collection.
2. Remove the sterile swab from the wrapper, taking care not to touch swab tip or lay it down on any surface.
3. Insert the white tip of the specimen collection swab about two inches (5 cm) into the opening of the vagina without touching the skin or labia external to the vagina.
4. Gently rotate the swab for 15 to 30 seconds against the sides of the vagina.
5. Withdraw the swab carefully. Do not touch the tip of the swab to area outside the vagina.
6. Handle the cap and tube carefully to avoid contamination, including the outside of the transport tube and cap. If necessary, change gloves.
7. Unscrew the transport tube cap and immediately place the specimen collection swab into the transport tube so that the white tip is down.
8. Carefully break the swab at the scored line on the shaft; use care to avoid splashing of contents.
9. Recap the transport tube. Ensure the cap seals tightly.
10. Label the transport tube with sample identification information, including date of collection using an adhesive label.

28.8 Appendix 8 - Abbott Alinity m Patient Collected Vaginal Swab Specimen Collection Guide

Your kit contains the following:

- One Transport Tube containing a liquid
- One Sterile Specimen Collection Swab
- One disposable Transfer Pipette

CAUTION: DO NOT touch the white tip of the swab or lay the swab down. If the white tip is touched or the swab is laid down or dropped, your results may not be accurate. You need to request a new Alinity m multi-Collect Specimen Collection Kit.

DO NOT pre-wet the collection swab with the liquid in the Transport Tube before collecting a sample.

DO NOT ingest or expose skin/eyes to the liquid in the Transport Tube.

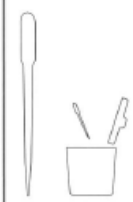
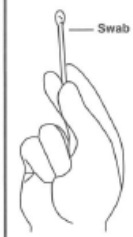
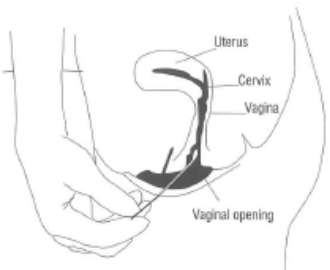
IF exposed or concerned: Get medical advice/attention.

Pre-Collection Steps

1. Wash your hands with soap and water thoroughly before starting and after completing all steps.
2. In the privacy of the examination room or restroom, you will need to undress from the waist down. You will need to position yourself to maintain balance during the collection procedure.
3. Open the kit package. Discard the transfer pipette (Shown in Diagram 1). Do not open the transport tube. Set the tube aside on a clean, dry surface before beginning collection.

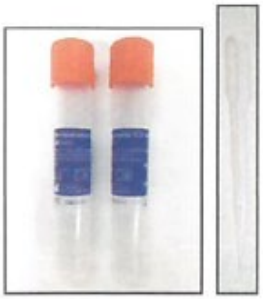
Collection Steps

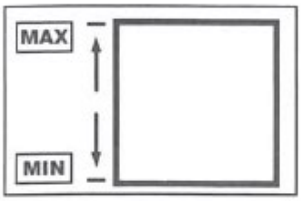
4. Remove the swab from the wrapper with your clean hands. Hold the swab with the white tip up (Shown in Diagram 2). Do not touch the tip of the swab to anything.
5. Holding the swab with one hand, gently spread the vaginal labia with your other hand. Insert the white tip of the swab about two inches (5 cm) into the opening of your vagina (Shown in Diagram 3). Rotate the swab for 15 to 30 seconds. Make sure the swab touches the sides of your vagina. Remove the swab from your vagina being careful not to touch your skin. Do not set the swab down.
6. While still holding the swab, unscrew and remove the cap from the transport tube without setting the cap down. Place the swab into the tube with the white tip down (Shown in Diagram 4 and 5). If the transport tube spills or liquid splashes out, you will need to request a new Specimen Collection Kit.
7. Break off the top of the swab along the score line. (The score line is made to break easily). Try not to spill or splash any of the liquid out of the transport tube. Screw the cap back onto the transport tube tightly (Shown in Diagram 6).
8. Return the transport tube containing the swab to the nurse or doctor.

Diagram 1	Diagram 2	Diagram 3	Diagram 4	Diagram 5	Diagram 6
					

28.9 Appendix 9 – Abbott Alinity m Urine Specimen Collection Guide (males and females)

Urine Specimen Collection



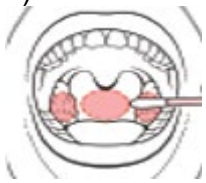


1. The patient should not have urinated for at least one hour prior to sample collection.
2. Discard specimen collection swab; it is not required for urine specimen collection.
3. Using a urine specimen collection cup, the patient should collect the first 20 to 30 mL of voided urine (the first part of the stream).
4. Unscrew the transport tube cap, taking care not to spill the transport buffer within.
5. Handle the cap and tube carefully to avoid contamination, including the outside of the transport tube and cap. If necessary, change gloves.
6. Use the plastic transfer pipette to transfer urine from the collection cup into the transport tube until the liquid level in the tube falls within the clear fill window of the transport tube label or else a new specimen should be collected. Do not overfill.
7. Recap the transport tube carefully. Ensure the cap seals tightly.
8. Label the transport tube with sample identification information, including date of collection using an adhesive label. Take care not to obscure the fill window on the transport tube.
9. Decontaminate and dispose of all specimens, reagents, and other potentially contaminated materials in accordance with local, state, and federal regulations.[1-2]

28.10 Appendix 10 – Instructions for Obtaining Patient–Collected Abbott Alinity m Rectal and Throat Swab Specimens

1. Discard disposable transfer pipette; it is not required for rectal swab specimen collection.
2. Remove the sterile swab from the wrapper; taking care not to touch swab tip of lay it down on any surface.
3. Hold the swab with the thumb and forefinger in the middle of the swab shaft covering the score line. Do not hold the swab below the score line.
4. Carefully insert the swab into your rectum about 2 inches (5cm) past the anal margin (the outside of the anus) and gently rotate the swab for 15 to 30 seconds.
5. Withdraw the swab carefully. Do not touch the tip of the swab to area outside of the anus.
6. Handle the cap and tube carefully to avoid contamination, including the outside of the transport tube and cap. If necessary, change gloves.
7. Unscrew the transport tube cap and immediately place the specimen collection swab into the transport tube so the white tip is down.
8. Carefully break the swab at the scored line on the shaft; use care to avoid splashing the contents.
9. Recap the transport tube. Ensure the cap seals tightly.
10. Label the transport tube with sample identification information, including the date of collection using an adhesive label.

1. Discard disposable transfer pipette; it is not required for throat swab specimen collection.
2. Remove the sterile swab from the wrapper; taking care not to touch swab tip of lay it down on any surface.
3. Hold the swab with the thumb and forefinger in the middle of the swab shaft covering the score line. Do not hold the swab below the score line.
4. Carefully insert the swab into your mouth ensuring contact with bilateral tonsils (tonsils on both sides of your mouth, unless your tonsils have been removed).



5. Withdraw the swab carefully. Do not touch the tip of the swab against the inside of your cheeks or tongue.
6. Handle the cap and tube carefully to avoid contamination, including the outside of the transport tube and cap. If necessary, change gloves.
7. Unscrew the transport tube cap and immediately place the specimen collection swab into the transport tube so the the white tip is down.
8. Carefully break the swab at the scored line on the shaft; use care to avoid splashing the contents.
9. Recap the transport tube. Ensure the cap seals tightly.
10. Label the transport tube with sample identification information, including the date of collection using an adhesive label.

28.11 Appendix 11 – Collecting a Blood Culture

See East Kent Hospitals University NHS Foundation Trust Policy for Blood Culture Collection in the Infection Prevention and Control Policies tab on Policy Centre.

Please ensure correct volume collected:

Adults up to10mls in each bottle (1 x Aerobic (green) & 1 x Anaerobic Bact/Alert (purple))

Paediatric 4mls in Bact/Alert (yellow)

Volumes greater than or less than these recommended volumes **DO NOT** maintain the optimal blood to medium ratio and may affect the recovery of organisms

28.12 Appendix 11.1 Phlebotomy Mycobacteria Blood Culture Collection Instructions

Patients will arrive in the Phlebotomy clinic with BD BACTEC™ Myco/F Lytic culture bottles supplied by the General Practice (Microbiology will provide the bottles on request to the GP's). Patients will also have a microbiology form requesting "Mycobacterium chimaera culture".

Three mycobacteria blood culture bottles should be inoculated on separate days and submitted to the Microbiology Department.

Pre-collection

- DO NOT USE any vial showing evidence of contamination, leakage or damage.
- Prior to use, each **glass** vial should be checked for damage. On rare occasions, the glass bottle neck may be cracked and the neck may break during removal of the flip-off cap or in handling.
- Each vial should be examined for evidence of contamination such as cloudiness, bulging or depressed septum, or leakage. If a contaminated vial is used for direct draw, gas or contaminated culture media could be refluxed into the patient's vein.

Collection

- The specimen must be collected using sterile technique to reduce the chance of contamination.
- The range of blood volume which can be cultured is 1 ml to 5 ml, with optimum recovery obtained at **3 ml to 5 ml.**
- Prior to inoculation, the medium fill volume should be noted on the label with a pen or marker to indicate the starting point of specimen collection. The vacuum in the bottle will usually exceed 5 mL, so the user should monitor the volume collected by means of the 5 mL graduation marks on the vial label.
- The bottle should be transported as quickly as possible to the laboratory.

28.13 Appendix 12 – Collecting Swab Samples (Howard, 2010)

A good aseptic technique must be used during the swab sample collection.
Ensure the specimen is labelled correctly as stated in section 10

1. Wound swabs

Remove the swab from the packaging and gently rotate the swab tip in the area where as much material as possible may be collected, collect fresh pus if present. To prevent contaminants affecting the validity of the result please remove any old pus that might be present before taking the sample. Replace the swab into the swab transport tube.

2. Nasal swabs

Remove the swab from the packaging and moistened the swab in sterile saline solution. Ask the patient to tilt their heads backwards as this will make it easier to collect the sample. Insert the swab into the nose, taking care not to touch the outer sides of the nose and gently rotate the swab against the inner surfaces of the nose and any lesions that may be present. Withdraw the swab and replace in the swab transport tube.

3. Throat swabs

Place the patient facing the light; depress the patient's tongue with a spatula to prevent contamination from the tongue in the event of the patient gagging. Remove the swab from the packaging and insert into the patient's mouth taking care not to touch the swab against the sides of the mouth. Gently rub the swab over any areas at the back of the throat that are inflamed including any lesions that may be present. Withdraw the swab and replace it in the swab transport tube.

4. Eye swabs

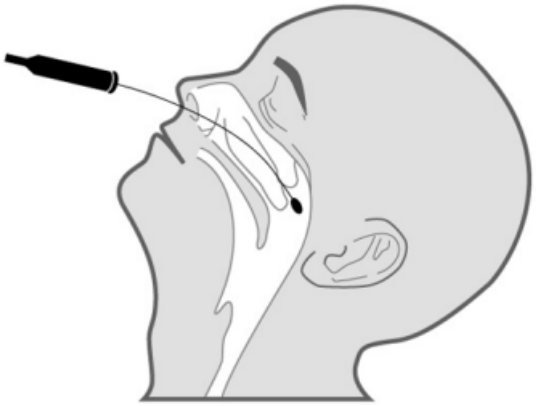
Ask the patient to try not to flinch during the procedure. Ask them to look up. Remove the swab from the packaging and moisten with sterile saline solution. Wearing sterile disposable gloves expose the pink conjunctiva by pulling gently on the eyelid. Collect the sample by gently rubbing the swab across the lower eyelid starting at the inner corner and working outwards. Replace the swab in the swab transport tube.

5. Ear swabs

Remove the swab from the packaging and place the swab in the outer ear (taking care not to push the swab in too far and damaging the ear drum). Gently rotate the swab to collect any pus or discharge. Replace the swab in the swab transport tube.

6. Pernasal swab

Ask the patient to look up. Remove the swab from the packaging. Pass the fine wire swab horizontally backwards along the floor of the nasal passage until the resistance of the soft palate is reached.



Withdraw the swab and replace in the swab transport tube.

28.14 Appendix 13 - Acanthamoaeba sample collection instructions

(LSHTM Handbook 2020) Diagnostic Laboratory Parasitology Laboratory User Handbook (lshtm.ac.uk)

Suitable sample types & sample preparation:

All specimens should be submitted for testing together with a completed *Acanthamoeba* referral form available to download and print from: www.parasite-referencelab.co.uk)

Please ensure all containers are tightly screwed and use Parafilm (NOT Sellotape) to prevent leakage during transit.

- **Clinical samples** (corneal scrapes, biopsies, fluids, swabs etc.) should be sent in a small volume (1 – 2 millilitre ideal) of sterile saline or sterile distilled water in a small (less than 5 millilitre) sterile vial or tube.

  Material from a **needle or blade scrape** should be rinsed into the saline or water. Please remove blades or needles after rinsing. Do NOT leave the blade in the tube as it rusts: this inhibits our PCR and may have a detrimental effect on culture isolation.

  Swabs or washings appear to be less efficient in detecting the organism. If swabs must be sent then please add a small volume of sterile saline or sterile distilled water to the swab to prevent drying. Please do not send dry swabs.

  Punch **biopsies** or portions of excised cornea may also be submitted: put sample into a small volume of sterile saline or distilled water in a small sterile vial.

- **Non-clinical samples -** contact lenses: should be sent in their lens cases (ie in used contact lens fluid.) Please note: we do not test commercial contact lens solutions (other than that already in patients' contact lens cases). Culture is performed on lenses and fluids; PCR is performed on fluids only. N.B. Isolation of *Acanthamoeba* from contact lens-related specimens, whilst suggestive, does not necessarily implicate the amoeba as causing the patient's symptoms. Amoebic genera (other than *Acanthamoeba*), flagellates, ciliates and other organisms may be found in contaminated washing fluids and on lenses, particularly with poor lens hygiene.

- **Culture-positive samples**: please send original culture plate if possible, or blocks of agar from the plate in a sterile vial.

DPL User Handbook Oct 2020 Accessible version. DB. Information valid on day of print/download only; please check website for updates

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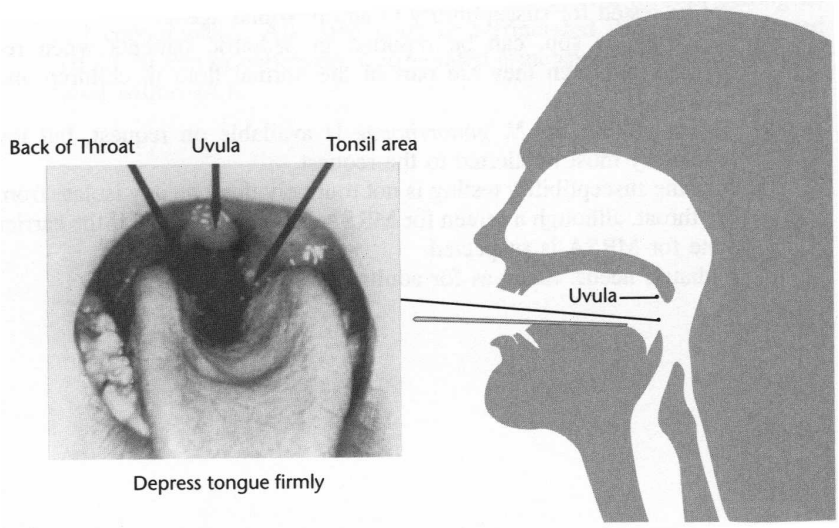
28.15 Appendix 14 – Collection of influenza swabs

Cases of suspected influenza (acute influenza-like illness or acute bronchitis within five days of onset of illness) are asked for a combined nose & throat swab specimen. A good specimen for the detection of influenza must contain a substantial number of respiratory epithelial cells, which are mainly obtained from the nasal swab. A throat swab alone will contain mainly squamous epithelial cells in which influenza does not replicate.

- A single swab with cotton wool bud is inserted in one nostril and rubbed against and above the nasal turbinate.
- A second swab is used to abrade the tonsils and pharynx.



- Both swabs are broken off into a **single** vial of viral transport medium (VTM)
- Replace lid of VTM vial and screw up firmly
- Label the vial of VTM with patient's name and date of birth

Please use the test request form supplied with each vial of VTM. Please fill in a separate form for each patient and please include:

1. Patient name
2. Date of birth
3. Sex
4. Whether the patient has influenza-like illness or acute bronchitis
5. Date of symptom onset
6. Influenza vaccine status, whether patient falls into Department of Health 'Green Book' Risk Group and details about any anti-influenza drugs (currently or in previous 14 days)

7. Date of swab

If you are not able to courier samples back immediately then they should be kept in a fridge at +4 °C and sent the next day.

Unused collection bag with swabs, request form and virus transport medium bottle should be stored at room temperature.

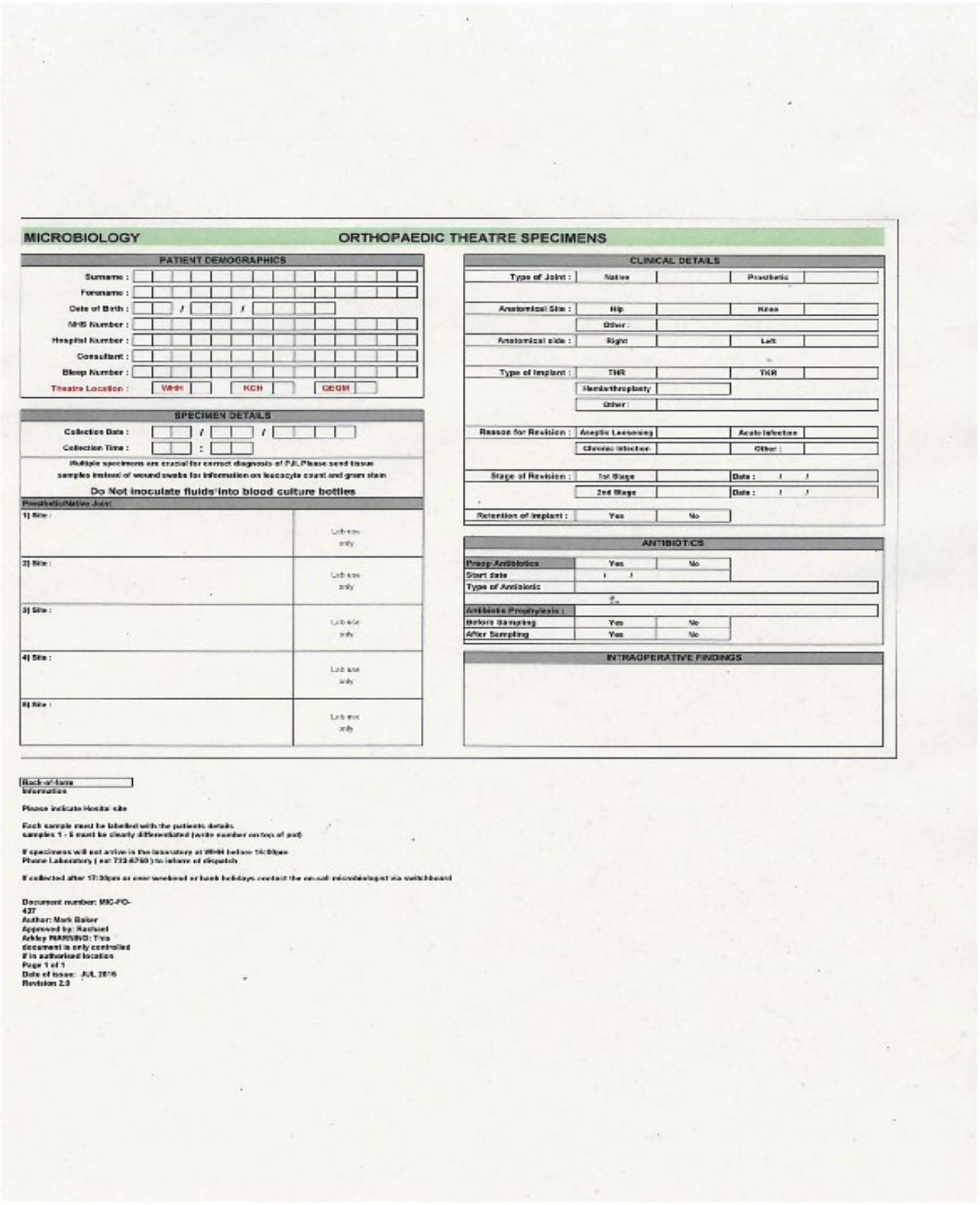
Any further information or help can be obtained by phoning your **Microbiology WHH** on 01233 616760

28.16 Appendix 15 – Collection of Sputum

- The patient should be encouraged to drink plenty of fluid the evening before the sputum collection
- Do not allow the patient to clean their teeth or use mouthwash before collecting the specimen as this may kill any bacteria present.
- Collect the specimen where possible before the patient eats or drinks (particularly important if TB is suspected.
- Instruct the patient that true sputum is required and not saliva e.g. collected after a deep cough or following physiotherapy.
- Ask the patient to take some deep breaths (or use a nebuliser) to loosen the secretions before coughing hard to bring the sputum into the mouth.
- The patient should then spit the sputum into the sample collection container
- Transfer the labelled specimen with the sample request form as soon as possible after collection.

28.17 Appendix 16 - Orthopaedic Theatre Specimens Request Form

Copy of FO MIC 437 Orthopedic Request f



MICROBIOLOGY — ORTHOPAEDIC THEATRE SPECIMENS

PATIENT DEMOGRAPHICS

Surname :
Forename :
Date of Birth : / /
NHS Number :
Hospital Number :
Consultant :
Bleep Number :
Theatre Location : WHH KCH CEDH

SPECIMEN DETAILS

Collection Date : / /
Collection Time : :

Multiple specimens are crucial for correct diagnosis of PJI. Please send tissue samples instead of wound swabs for information on leucocyte count and gram stain

Do Not inoculate fluids into blood culture bottles

Prosthetic/Native Joint

1) Site : Lab use only
2) Site : Lab use only
3) Site : Lab use only
4) Site : Lab use only
5) Site : Lab use only

CLINICAL DETAILS

Type of Joint :	Native		Prosthetic	
Anatomical Site :	Hip		Knee	
	Other :			
Anatomical side :	Right		Left	
Type of Implant :	THR		THR	
	Hemiarthroplasty			
	Other :			
Reason for Revision :	Aseptic Loosening		Acute Infection	
	Chronic Infection		Other :	
Stage of Revision :	1st Stage		Date : / /	
	2nd Stage		Date : / /	
Retention of Implant :	Yes	No		

ANTIBIOTICS

Prep Antibiotics	Yes	No
Start date	/ /	
Type of Antibiotic		
Antibiotic Prophylaxis :		
Before Sampling	Yes	No
After Sampling	Yes	No

INTRAOPERATIVE FINDINGS

Back-of-form Information

Please indicate Hostar site

Each sample must be labelled with the patients details
samples 1 - 5 must be clearly differentiated (write number on top of pot)

If specimens will not arrive in the laboratory at WHH before 16:30pm
Phone Laboratory (ext 7334760) to inform of dispatch

If collected after 17:30pm or over weekend or bank holidays, contact the on-call microbiologist via switchboard

Document number: MIC-PO-437
Author: Mark Baker
Approved by: Rachael Ashley WARNING: This document is only controlled if in authorised location
Page 1 of 1
Date of Issue: JUL 2016
Revision 2.0

28.18 Appendix 17 – supplies order form

Copy of Pathology Supplies order form Jı

Pathology Supplies Order Form

Version 6 (July 2016)

Please complete, 'save as' a new document, retitle it based on the date and return excel spreadshhet by email to: ekh-tr.PathologyOrder@nhs.net

Name of Practice:	Please complete here
Address for delivery:	Please complete here
Contact Name:	Please complete here
Contact telephone number:	Please complete here
Contact email address:	Please complete here

Picture	Supply Chain Description	Product code	Supply Chain Code (NSV)	Unit of issue	Bar code	Insert here: Quantity Required by unit of issue
	Needle multisample 22g x 1.5 inch black	450075	KFK230	100		
	Needle multisample 21g x 1.5 inch green	450076	KFK228	100		
	Safety needle holder - quickshield	450230	KFK287	50		
	Blood sample tube heparin - Green	454029	KFK028	50		
	Blood sample tube FBC - Lavender	454209	KFK221	50		
	Blood sample tube serum - Gold	454228	KFK305	50		
	Blood sample tube glucose - Grey	454238	KFK330	50		
	Blood sample tube coagulation - Light Blue	454334	KFK469	50		
	Blood sample tube serum - Red	456089	KFK307	50		
	Blood sample tube EDTA - Pink	456242	KFK576	50		
	PAEDIATRIC - Blood sample tube - lavender	459036	KFK209	100		
	PAEDIATRIC - Blood sample tube - gold	459071	KFK334	100		
	PAEDIATRIC - Blood sample tube - blue	459075	KFK210	100		
	PAEDIATRIC - Blood sample tube - green	459084	KFK211	100		
	PAEDIATRIC - Blood sample tube - grey	459085	KFK214	100		
	PAEDIATRIC - Blood sample tube - red	459092	KFK212	100		
	Universal container - white top		KCP409	50		
	Red top urine container with boric acid			50		
	Urine collection cup			1000		
	Faeces Container - blue cap attached spoon		KCP416	50		
	Sputum Container with metal cap		KCP144	50		
	Charcoal TranSwab - Black		HHD024	125		
	ENT swab - Orange Swab		HHD021	125		
	Chlamydia swab - Unisex - Purple		HHD187	50		
	Chlamydia swab - self take - Orange		HHD186	50		
	Viral Swab - Green			1		
	MRSA Screen Sigma Transwab duo		HHD271	125		
	High energy nutritional supplement - ready to drink		ABX074	1		
	Dermapak (skin and nail fungal investigation)	Dermapak		1		
	Histology pots	Cellpath		25		
	Pathology specimen bag (DART)	Eximex UK Ltd	KFD011	100		
	Blood Sciences Request Forms	Harlow	EKH778	500		
	Microbiology Sciences Request Forms	Harlow	EKH777	500		
	Blood Transfusion Forms	Harlow	EDCSKH124	500		
	Blood and Microbiology Specimen Bag (This product replaces the red and green specimen bags)		KFD007	1000		
	Container 24 hour urine - 5Ltr	To order your 24 hour urine container, please call the following number with the patients name and type of test required: K&C is 01227 864151, QEQMH is 01843 234250 WHH is 01233 633331 ext 723-8054				

08 December 2016