NWL Pathology User Guide (Imperial & CW Sites)

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PATHOLOGY USER GUIDE CONTENTS

North West London Pathology Laboratories are committed to delivering an accredited, efficient, user friendly and responsive Pathology Service. Our aim is to support all users to deliver top quality patient care and to aid excellent education and world-class research.

INTRODUCTION

What is North West London Pathology (NWL Pathology)?

The partnership between Imperial College Healthcare NHS Trust, Chelsea and Westminster NHS Foundation Trust and The Hillingdon Hospitals NHS Foundation Trust has created an innovative and sustainable Pathology service that delivers outstanding quality to users and patients alike. This innovative approach allows the service to better managing demand, standardise operations, improve value for money and make use of new technologies. The modernisation of pathology services represented by NWL Pathology also provides a great opportunity to drive translational research in all aspects of pathology, as well as supporting training for medical and scientific staff.

NWL Pathology is based on a 'hub and spoke' structure; the majority of routine, specialist and non-urgent, activity is centred at Charing Cross Hospital. Urgent tests required for immediate patient management and treatment will be performed in 24/7 essential service laboratories based on-site in the other hospitals in the group.

The hospitals included within the NWLP partnership are: Imperial College Healthcare NHS Trust, which comprises St Mary's Hospital, Charing Cross Hospital, Hammersmith Hospital, Queen Charlotte and Chelsea Hospital, and the Western Eye Hospital; Chelsea & Westminster NHS Foundation Trust, which comprises Chelsea & Westminster Hospital and West Middlesex University Hospital; and Hillingdon Hospitals NHS Foundation Trust, which comprises Hillingdon Hospital and Mount Vernon Hospital.

NWL Pathology User Guide

The transition of services from previous owner Trusts to North West London Pathology will include the harmonisation of services and implementation of new equipment and IT systems. Until this transition is complete it is necessary to maintain separate information for Imperial & Chelsea and Westminster Hospital, West Middlesex University Hospital, and The Hillingdon Hospitals.
Note this guide applies to the service provided from Imperial sites: St Mary's Hospital, Charing Cross Hospital, Hammersmith Hospital, Queen Charlotte and Chelsea Hospital, and the Western Eye Hospital; and the Chelsea and Westminster Hospital.

The information contained in this User Guide has been developed in conjunction with our users in order to meet their needs and requirements. This booklet provides information about the diagnostic pathology service provided by NWL Pathology at the Imperial and Chelsea and Westminster hospital sites and we hope that it will enable you to make the most efficient use of the service. If you have any questions or require information about the service provided by a specific laboratory, please contact the laboratory directly and ask for advice from a Pathologist or a Senior Healthcare Scientist as appropriate. Alternatively email your questions to ICHC-tr.pathologyqueries@nhs.net

The NWL Pathology Website www.NWLPathology.nhs.uk is an excellent resource for Pathology information. The website provides up to date news, test directory (including sample requirements and TAT), contact details and frequently asked questions.
For any additional information regarding specimens (including collection), paediatric guidance, specific departmental enquiries and / or clinical advice, please refer to the individual departments.

Within North West London Pathology, the following accreditation references apply to the services provided from Imperial hospitals and Chelsea and Westminster hospital:

- Microbiology (UKAS Ref: 8659)
- Clinical Biochemistry (UKAS Ref: 8673)
- Haematology & Blood Transfusion (UKAS Ref: 8674)
- Infection & Immunity (UKAS Ref: 8756)
- Cellular Pathology (UKAS Ref: 9615)

PATHOLOGY ADMINISTRATION OFFICES (Including Pathology IT)

LOCATIONS:

Main Pathology Administration Office - Charing Cross Hospital
The NWL Pathology Call Centre (for Imperial sites and Chelsea and Westminster Hospital), Quality Offices and IT Offices are located at Charing Cross Hospital, on the 2nd Floor of the Laboratory Block, Charing Cross Hospital.

SERVICE:

The Pathology Administration Office at Charing Cross Hospital is the central management and collection point for GP consumables which are delivered to the General Practices served by Pathology, at regular intervals. Couriers collect specimens from GP surgeries at regular intervals which are delivered to the laboratories for analysis.

The Pathology Call Centre at Charing Cross Hospital is the central point for communications to and from all Imperial sites and Chelsea & Westminster Hospital for pathology enquiries.

The IT offices at Charing Cross Hospital are responsible for the Laboratory Information Management System and associated interfaces for Charing Cross, Hammersmith, St Mary's and Chelsea & Westminster Pathology. This includes the electronic result distribution to all users including GPs. Any queries regarding Electronic Results can be directed to the Pathology IT offices on ext 17600 or via email to Imperial.pathologyit@nhs.net

PATHOLOGY RESULTS:

The Pathology Call Centre at Charing Cross has dedicated phone lines which provide pathology results for all Pathology laboratories across Imperial sites and Chelsea & Westminster Hospital. The staff in the Pathology Call Centre will be able to provide information regarding all services offered and appropriately direct any query regarding initiating service improvements for both internal and external users of the service. If a result is not available when expected please phone the Call Centre for assistance.

KEY PATHOLOGY PERSONNEL / CONTACT NUMBERS:

Pathology Enquiries/Results	020 3313 5353/5386
Pathology IT enquiries	020 3311 7600
Saghar Missaghian-Cully	020 3313 5909
Phil Brown, Director of Operations, NWL Pathology	020 331 17125
Allen Widdowson, Director of Finance, NWL Pathology	020 331 17125
Charlotte Mustoe, Divisional Manager Blood Sciences	020 3313 5908
Angela Jean-François (nee Hall), Divisional Manager I&I Sciences	020 3311 7262
Danya Cohen, Divisional Manager Cellular Pathology	020 3311 5196
Mark Busby, Divisional Manager, Pathology Corporate Services	020 3311 7100
Helen Hobson, NWL Pathology Quality & Governance manager	020 3311 5176
Edwin Turner, Pathology IT Systems Development Manager	020 3312 1290
Tony Macdonald, Pathology IT Operations Manager	020 3311 7121
Olubunmi Martindale-Sheldon, Point of Care Testing Manager	020 33117081

COMPLAINTS or CONCERNS

Should you have the need to lodge a complaint related to Pathology, please contact Helen Hobson, the NWL Pathology Quality & Governance manager via telephone on 020 3311 5176 or

via email ICHC-tr.pathologyqueries@nhs.net All concerns / complaints will be promptly responded to in line with Trust and Pathology policies and procedures.

CONFIDENTIALITY AND THE PROTECTION OF PERSONAL INFORMATION

North West London Pathology is committed to deliver a first class confidential service ensuring that all patient information is processed fairly, lawfully and transparently. Confidential information about patients can only be used for healthcare and relevant business purposes. All staff follow the ICHNT Trust Information Security Policy and confidentiality guidance. In addition to this all HCPC registered staff follow the HCPC confidentiality guidance for registrants and code of conduct.

CLINICAL TRIALS AND PRIVATE PATIENTS

The Pathology Call Centre coordinates all private work for North West London Pathology. If you would like prices or advice regarding any non-NHS Pathology please contact Mark Busby, Divisional Manager, Pathology Corporate Services on 020 3311 7100.

CLINICAL GOVERNANCE:

		Ext.
NWL Pathology Quality & Governance manager	Helen Hobson	15176
Clinical Lead for Quality & Governance	Dr Fiona Regan	32324
Department Quality & Governance Managers:		
Cellular Pathology	Sarah Horton	15175
Clinical Biochemistry	Varsha Patel	15170
Haematology & Blood Transfusion	Superna Sohal	15174
Infection & Immunity Science	Emer Fahy	15175
Point of Care Testing	Olubunmi Martindale-Sheldon	17081
Quality & Logistics Manager, Corporate Services	Florence Ejiofor	15174

USEFUL INFORMATION:

DEPARTMENT	SITE	ENQUIRIES EXT	LABORATORY MANAGER	ON-CALL BLEEP
Blood transfusion	CXH	17112	17116	8160
	C&W	58207	55155	0360
	HH	34772	34774	9122
	SMH	21157	22203	1611
Cellular Pathology				
Histology	CXH	17132/17139	17131/30560	N/A
Electron Microscopy	CXH	17147	17147	N/A
Histology	HH	32438	38147	N/A
Histology	SMH	21260	27850	N/A
Cytology	SMH	21387	26262	N/A
Haematological Molecular Diagnostics	HH	32179		
Cytogenetics	HH	32169	31502	N/A
Clinical Biochemistry	CXH	35353	17062/35924	8161
	C&W	35353	58094	0143
	HH	35353	32109	9022
	SMH	21268	21687	1022
Andrology	HH	34680	34682	-
Haematology	CXH	30520	17116	8160
	C&W	55206	58213	0360
	HH	32453	33293	9079
	SMH	26540	22490	1611
Microbiology	CXH	35353	17883	0248
Virology	CXH	10130	10130	N/A
Immunology	CXH	10130	10130	N/A
H&I Lab	HH	38211	38211	Contact via Hammersmith hospital switchboard
Point of Care Testing (POCT)				
	CXH	17071 (bleep 5942)	17062	8161
	C&W	55135 (bleep 0143)	58094	0143
	HH	32446 (bleep 9606)	32109	9022
	SMH	21320 (bleep 1022)	21687	1022
Virology-related POCT (e.g. POCT HIV, RSV etc.)	CXH	10173	10130	N/A
FOR ALL RESULTS (MONDAY – FRIDAY 9am to 5pm) PLEASE CALL Pathology Call Centre on 020 331 35353				

MAKING A PATHOLOGY REQUEST

Hospital Patients including Out Patients - All Pathology requests should be made via the local electronic ordering system. In the unusual event that the electronic ordering system is not available please refer to downtime procedures on page 13 of this document.

The information provided below should be read in conjunction with the agreed Trust policy on the information required by the laboratory for blood transfusion requests.

It is imperative that the correct patient is selected on the local electronic ordering system to ensure that the correct result is being issued on the correct patient. If you do make an error, contact Pathology Queries ICHC-tr.pathologyqueries@nhs.net as soon as possible.

It is the responsibility of the requesting clinician completing the paper request form or the electronic request to ensure that sufficient information is provided and all information is correct even if these duties are delegated. The onus is not on the laboratory to make assumptions about the origins or nature of specimens or the accuracy of any given details. If the information given is inadequate to process the request, delays may occur or the request may be rejected/returned to the sender. Every effort will be made to ensure that specimens are processed correctly and that vital specimens are not discarded, but in the event of doubt as to the integrity of the information provided or the source of a specimen it will be destroyed.

Clinical staff are reminded to ensure that sufficient and relevant clinical details are completed on the local electronic ordering system (or paper forms where applicable). Providing sufficient clinical information is crucial as it may influence any reflex tests as well as guide staff towards and enhanced personal protective equipment or special handling requirements. Clinical details should also include the travel history of the patient if known.

When requesting tests on known high risk samples clinical staff are asked to convey details of known high risk samples to laboratory staff prior to sending samples to the laboratory.

Each specimen must be collected in the correct container, if you do not have details or are unsure of which container to use, please contact extension 35353 at Charing Cross Hospital. We will be happy to arrange for colour posters/cards to be sent to you. If samples need to be taken you should contact the relevant laboratory as your first port of call, otherwise the Pathology Call Centre staff will forward you to the relevant laboratory.

The Cerner OCS system provides labels for containers, except for Blood Transfusion requests which must still be hand-written. It is essential to note carefully that the container printed on the label matches the container type and the patient name on the label is correct. For these requests, there is no request form required (except samples for Cellular Pathology and Blood Transfusion where a printed Order Communications Systems (OCS) request form is required to be sent with the specimen).It is essential to check the quality of the barcode printing on the label - both print quality and the text position must be checked. Barcode printers which are not printing properly must not be used until ICT have rectified the fault (call ICT helpdesk 5555 to report printer faults urgently). Specimens labelled with printed labels where the patient identifiers are not clear and legible may be rejected.

For gynaecological cytology, the laboratories encourage smear takers to use pre-printed Open Exeter forms or OCS forms where available, otherwise use the standard HMR101 form, see p18 for further details.

For haematological molecular diagnostics requests, complete the form available on the Pathology website.

PROTOCOL FOR SPECIMENS and REQUEST FORMS:

Both specimens and specimens that are accompanied by request form (e.g. blood transfusion, cellular pathology and GP requests) must EACH have a minimum of three **patient identifiers:**

1. **Patient's full name (first name and surname) or unique alternative identifier e.g. Clinic number prefix for GUM patients**

2. **Date of Birth**

3. **Hospital/NHS number***

(Note: NHS number can only be used as the third identifier if patient name is provided therefore cannot be used as the third identifier with GUM clinic numbers. *For samples referred from external laboratories the hospital number may be replaced by the referring hospital laboratory number)

All samples, in addition to the above identifiers, should be labelled with the sample collection date and initials or signature of collector.
The Blood Transfusion laboratory will NOT accept samples that do not include these additional labelling requirements.

It is preferable that samples are sent to the laboratory in one bag per patient's samples. Where request forms are not printable and samples are received for multiple patients in one bag, it is the person collecting the samples' responsibility to ensure all samples are labelled correctly with the correct patient identity and minimum labelling criteria as above.

Specimens from A&E:
Specimens sent to the laboratory for an A&E patient should follow the above protocol; however where the patient's identity cannot be confirmed both specimens and forms must each have the following three minimum identifiers:

1. A&E number
2. "Unknown Female" or "Unknown Male" (instead of name)
3. "Unknown DOB"

**NB At St. Mary's trauma centre the patient will have an alias instead of "Unknown Female/male" These Patients are given names which would never normally be names (elements, railway stations, phonetic alphabet) and so should be recognisable, examples include Chlorine Zeta and Caesium Quebec. DOB for unknown adult patients is 01.01.1900. DOB for unknown paediatric patients is today's date. Please refer to specific Trauma centre naming protocol.

Specimens will be accepted for analysis provided:

- The specimen is adequately identified
- The specimen is appropriate (i.e. correct blood tube, expiry date etc.)
- The investigation required is clearly indicated on the sample label or request form.
- The sample type identified on the label matches the sample received.
- Sufficient volume of sample has been collected

Refer to the Pathology Specimen Labelling and OCS Downtime Policy for further information

Each request accepted by the laboratory is considered an agreement to provide Pathology Services. Pathology is responsible for the provision of the requested investigation. It is the responsibility of the person (doctor, nurse, phlebotomist) collecting the sample from the patient to ensure that the specimen container is correctly labelled after filling. Please double check the patient identity especially when using OCS labels. In addition the following information must be

provided, when clinically appropriate, to ensure appropriate interpretation and timely reporting of results.
NB* Many tests require the age and sex of patients to interpret appropriate reference ranges.

Cellular Pathology all specimens must be accompanied by a request form. Histopathology and Cytology require the printed OCS request form, for HMDS samples a referral note to include all relevant clinical information must be sent, along with the HMDS request form with the sample.
In addition to the minimum requirements for patient identification, please include the infection status of the specimen if known and relevant, plus a brief outline of the clinical history, if diagnostically relevant. Include any other patient identifiers deemed relevant by the sender (address, gender, etc.). If the specimen is urgent, state this on the request form. When the patient is private rather than NHS, this must be clearly indicated with an address for billing (unless billing is through the 15th Floor at Charing Cross, the Sainsbury Wing at Hammersmith or the Lindo Wing at St. Mary's) on the request form.

Blood Transfusion all specimens must be accompanied by the printed OCS request form (the details on the specimen must be handwritten) If the patient has any special transfusion requirements, these must be included on the request form.

At all Imperial hospital sites pathology requests are made electronically via Order Communications Systems (OCS). Chelsea and Westminster associated sites use the IDS Lastword system. The OCS systems are supported by the various respective organisations and IT staff. Each organisation is responsible for ensuring system users follow correct requesting procedures and for the provision of an alternative requesting procedure to be followed during downtime.

GP Surgeries (including other community based services):

Each specimen must be collected in the correct container and be labelled with the patient's surname, patient's forename, date of birth, and NHS number, collection date and specimen type. If you do not have collection container details or you are unsure of which container to use, please contact the Pathology Call Centre on extension 35353. We will be happy to arrange for colour posters/cards to be sent to you. You can also use the specimen container guide and test directory on the Pathology Website www.NWLpathology.nhs.uk

The *request form* must be completed in full to show the patients' full name, date of birth and NHS number. Patient address and contact details should also be stated, in case critical results need to be passed to the GP 'out of hours service'. Time and date of sampling, the type of specimen and investigation(s) required including any relevant clinical details and information related to drug therapy must also be included as these may affect the way in which the specimen is processed and the interpretation of the results.
The name of the requesting doctor **must** be clearly identified on all request forms. Doctors and nurses from General Practices who regularly make Pathology requests will have been allocated a code which uniquely identifies the requestor. Please ensure that this code along with the practice address is clearly shown on the request form. Note: If a test request is ''urgent' please mark the request form as so and provide a contact number for enquiries.
Specimens that do not meet sample acceptance criteria may not be processed.

GENERAL PRACTICE ELECTRONIC REQUESTING:

A web based electronic ordering system is available for GPs which has been integrated into SystmOne, EMIS and IPS practice systems, supported by the CCGs for implementation and training. All general pathology and most common radiology requests can be made on this system.

Electronic requesting vastly reduces the number of errors in patient identification and subsequent matching when results are received.

The CCGs across North West London and Imperial College Healthcare NHS Trust have been working together to establish the Diagnostic cloud. This allows GPs to access all patient results for both Radiology and Pathology wherever they are processed in North West London. The Diagnostic Cloud is an exciting development, set to transform diagnostic services, with huge savings in time and resources for staff, faster diagnostic turnaround and reduced test request duplication and stress for patients. Diagnostic results from Imperial college Healthcare NHS Trust secondary care, North West London, West Middlesex and Hillingdon hospitals are available based on matching patients by NHS number. The Diagnostic Cloud is supported by Sunquest ICE and Opennet, both systems can be accessed directly from the patient administration system, allowing electronic orders to be placed and access to results from Pathology providers across North West London.

We are also rolling out Radiology Order Communications which will work in exactly the same way, but with the very specific requirements for those requests.

For any further information please contact your network relationship manager or put your query in an email to the IT Projects Team with the subject heading: 'Diagnostic Cloud'

Central London: CLCCG.ITprojects@nhs.net

TRANSPORT OF SPECIMENS

Also see GEN-MP-048-IMP.Imperial Transportation of Pathology Specimens Procedure:
Available on the trust intranet:
http://extra.imperial.nhs.uk/prdcont/groups/intranet/@corporate/@policies/documents/ppgs/id_020163.pdf

There are routine locally arranged specimen collection rounds for wards and departments within the trust. There is also a pneumatic tube system available for sending specimens to all Pathology laboratories. Where there is no pneumatic tube station, specimens should be transported to the laboratories using porter services.

The pneumatic tube system provides a rapid delivery system for urgent specimens; please use it in preference to the portering system, especially out of hours (see next page for details) and at weekends.
****NB at CWH there is only one pneumatic tube delivery from A&E.***

The pneumatic tube system must *not* be used for:
1. Samples for blood gas measurement
2. Transfusion and Haematology for a patient who is bleeding
3. Histology specimens in formalin
4. Blood culture bottles
5. Specimens infected with known or suspected Hazard Group 3 or 4 organisms (consult Microbiology lab if in doubt)
6. Specialised coagulation tests or any test for platelet function studies
7. Specimens on dry ice
8. Leaking or broken sample containers
9. Large volume samples e.g. 24-hour urine collection, EMU samples
10. Return of blood component packs via tube system

It is the responsibility of the requesting doctor to ensure that the specimen reaches the laboratory. If delivering an urgent specimen to the laboratory by hand please ensure that the specimen reception staff are notified of the urgent status of the specimen.

Specimens from GP practices are either collected by the hospital courier or posted to the laboratory directly. Gynaecological cytology samples from West Middlesex and Hounslow are delivered by Hillingdon Hospital Transport.

All Gynaecological cytology samples need to be placed inside the purple bag; this ensures the samples arrive at the correct laboratory site as quickly as possible. Bags are a part of the LBC kit, see p19 for further information.

Patients may also deliver specimens to the reception area situated in the QEQM Wing at St Mary's or the central specimen receptions at Charing Cross, Chelsea & Westminster and Hammersmith Hospitals.

Transportation of the deceased is undertaken by porters. For further information or clarification in hours please contact the Patient Affairs Offices on the relevant site (SMH x21232, CXH x11098, HH x33075, C&W x58650).For out of hours guidance please contact site operations managers on the appropriate site (HH Bleep – 9335, CXH Bleep – 7460**,** C&W Bleep – 0111, SMH Bleep - 1065).

OUT OF HOURS SERVICE

Only use the out-of-hours service for genuine emergencies. Tests requested under this system are far more costly than the equivalent performed during the day. Abuse of the system for carrying out routine work causes delays in processing genuinely urgent work and may limit the range of service in the future. Contact the appropriate duty Healthcare Scientist directly when requiring this service.

Hospital Site	Department	Contact	Time of OOH Service
Charing Cross	Microbiology	Bleep 0248	20:00-08:00
	Clinical Biochemistry	Bleep 8161	17:30-0900
	Haematology/Transfusion	Bleep 8160	17:30-0900
Chelsea & Westminster	Clinical Biochemistry	Bleep 0143	17:30-0900
	Haematology/Transfusion	Bleep 0360	17:30-0900
Hammersmith	Clinical Biochemistry	Bleep 9022	17:30-0900
	Haematology	Bleep 9079	17:30-0900
	Blood Transfusion	Bleep 9122	17:30-0900
St Mary's	Clinical Biochemistry	Bleep 1022	17:30-0900
	Haematology/Transfusion	Bleep 1611	17:30-0900

CASE NUMBERS

The Pathology information systems rely on LEGIBLE, ACCURATE patient CASE NUMBERS for reliable processing of results.

Failure to supply the case number on request forms:

1) Introduces the *possibility of confusion* between patients with similar names
2) Undermines the potential of computer systems to provide *accurate and rapid retrieval of patient results.*

Please print all patient information on the request forms if not requesting tests electronically.

POTENTIALLY INFECTIOUS SAMPLES

Patients with fever/rash who have recently returned from countries where Viral Hemorrhagic Fevers are endemic (e.g. Africa, S. America, rural Asia) need to be considered as potentially infected. No samples should be taken from such patients without permission from the duty Infectious Disease SpR/Consultant, or duty Diagnostic Virology consultant.

ACTIONS IN THE EVENT OF ELECTRONIC ORDERING DOWNTIME (HOSPITAL PATIENTS ONLY)

ALL IMPERIAL HOSPITAL SITES

For Ordering Pathology tests

Downtime forms will only be processed when there is OCS downtime

In the Event of either Planned or Unplanned OCS down time the IT help desk will ensure that a message is available on all hospital terminals.

- Note due to the possibility of network/ Intranet failure a stock of downtime forms should be kept. Please use a photocopy if the IT systems are unavailable and the stock is running low.

- Paper request forms must be kept in a controlled location accessible to all ward staff. (Generally it is expected that there will be a single location for each clinical area) Each area should review where forms are kept and ensure that staff are kept informed of their location. This location should be easily accessible in the event that there is an emergency and staff need to use hand written request forms. Should these supplies run out, or at the end of the downtime new forms can be printed via the hospital intranet The Source: http://source/pi/downtime-procedures/id_030149?ssSourceSiteId=source. Following any down time it is good practice for clinical areas to replenish their stock of forms.

- Paper forms can only be used; in any of the following circumstances below:
  - When there is a total network failure i.e. no PC can be accessed
  - When OCS is down
  - Emergency situations (e.g. delivery suite) where patient is not registered not A&E

- The downtime operational procedure needs to be part of training and Clinical Managers need to know where the forms are kept.

- Each ward/location is responsible for informing staff of the downtime operational procedure and ensuring that the policy is followed accordingly and most importantly ensuring patient safety.

For Pathology Results

Contact the Pathology Call Centre on ext 35353 during business hours (09:00am to 5:00 pm). During out of office hours, users should contact the laboratory staff directly through the Trust's pager service.

CHELSEA & WESTMINSTER HOSPITAL

For Ordering Pathology tests

For planned downtime, messages are sent out by email, daily notice board and Lastword message of the day to inform users of the expected time and length of the downtime. In the event of unplanned problems users should contact the IT helpdesk ext 58899 to confirm the downtime.

If electronic ordering downtime is confirmed, Pathology ordering should be carried out by fully completing a written request form.

This should include the patient's Lastword hospital number, their full name, D.O.B., Location and physician. It should also clearly indicate what requests are required. Electronic ordering downtime forms are available on the intranet and copies of these forms can also be found at the main reception desk on the ground floor. These forms will only be accepted during the downtime period.

For Pathology Results

- Contact the Pathology Call Centre on ext 35353 during business hours (9:00am to 5:00 pm).

- Pathology Reports generated during the down time period, will be printed in the laboratory and clinically significant and abnormal results will be 'phoned through to the requesting clinician, ward, etc.

- Pathology Reports for A&E will be sent via the "POD" system if available.

- Prolonged downtime (>1 day) effect on Pathology Reports:
  providing that the laboratory systems are not affected, reports will be printed and reported back on paper.

CELLULAR PATHOLOGY – All Sites

LOCATIONS

The Cellular Pathology Departments incorporate Cytopathology, Histopathology, Electron Microscopy, Molecular Diagnostics (molecular, immunophenotyping and cytogenetics) and Mortuary services.

St. Mary's Hospital (SMH) site:
Gynaecological and non-gynaecological cytopathology - 1st floor Mint Wing (Entrance H)
Histopathology - 4th floor of the Clarence Wing
Mortuary - 6 South Wharf Road

Hammersmith Hospital (HH) site:
Non-gynaecological cytopathology – ground floor building 541
Cellular Pathology consultants and secretariat – 1st floor building 541
Histopathology – 1stfloor 'G' Block
Haematological Molecular Diagnostics (HMD) – 2nd floor 'G' Block
Mortuary – 1st floor Mortuary and Stores building (Building 122)

Charing Cross Hospital (CXH) site:
Electron Microscopy – 6th floor laboratory block
Histopathology – 3rd floor laboratory block
Mortuary – lower ground floor laboratory block

DESCRIPTION OF SERVICE

The Cellular Pathology departments provide a comprehensive diagnostic service including frozen sections and a rapid service for urgent biopsies and fine needle aspirates. Body Stores are located at all sites (Charing Cross Hospital, Hammersmith Hospital and St. Mary's Hospital) all post mortem activity is undertaken on the St. Mary's site only. Electron microscopy is available at Charing Cross. The Haematological Molecular Diagnostics Service (HMDS) operates on the Hammersmith site.

All sites are fully accredited by CPA (4020) and hold current and appropriate HTA licenses. The laboratories participate in the appropriate UKNEQAS schemes, and other external quality assurance schemes, and have comprehensive internal quality assurance and control procedures.

KEY CONTACT TELEPHONE NUMBERS CXH

Reception and Enquiries	020 331 30554
Laboratory Manager	020 331 17131
Electron Microscopy	020 331 17147

KEY CONTACT TELEPHONE NUMBERS HH

Reception and Enquiries	020 331 32438
Laboratory Manager	020 331 38147
Cytology Enquiries	020 331 33103

KEY CONTACT TELEPHONE NUMBERS SMH

Reception and Enquiries	020 331 21260
Histopathology Laboratory Manager	020 331 27850
Cytology Laboratory Manager	020 331 26262

KEY PERSONNEL TELEPHONE NUMBERS

Divisional Manager Cellular Pathology: Danya Cohen – 020 331 15196

Divisional Clinical Lead for Cellular Pathology: Dr Corrina Wright – 020 331 21674 (Monday & Friday) and 020 331 32265 (Tuesday, Wednesday & Thursday)

Cellular Pathology Quality & Governance Manager: Sarah Horton – 020 331 15175

Extension numbers in the tables below are listed prefixed with an x.
These can be called directly from outside of the Trust by prefixing with **020 331** and then the five digit number, for example the SMH mortuary on x21191 can be dialled directly using 020 331 21191.

Cellular Pathology Consultant Pathologists

Specialty Area	Consultant Pathologist	Extension Number
HIV/Hepatobilary/Upper & Lower Gastrointestinal	Prof. Rob Goldin	x21305
Hepatobilary/Urology/Upper & Lower Gastrointestinal	Dr. Jo Lloyd	x21354
Post Mortem/Breast/Lower Gastrointestinal	Dr. Mike Osborn	x26438
Gastrointestinal/Pancreatobiliary	Dr. Pat Cohen	x27864
Cytopathology	Dr. Corrina Wright	x21674/x32265
Cytopathology/Gastrointestinal	Dr. Priya Mairembam	x21770/x26494
Cytopathology/General	Dr. Rashpal Flora	x32430/x26319
Cytopathology/Pancreatobiliary/General	Dr. Raida Ahmad	x32265/x26494
Placental Pathology	Dr Samantha Levine	x21260
Dermatology	Dr. Nick Francis	x17153
Urology	Dr. Ethna Mannion	x17150
Skin/GI	Dr. Thomas Lynch	x26236/x11377
Breast Pathology	Prof. Sami Shousha	x17140
Head & Neck/Dermatopathology	Dr. Justin Weir	x17265
Dermatology/Urology	Dr. James Carton	x30569
Breast	Dr. Faiza Rashid	x17144
Neuropathology	Dr. Paul Lewis	x17141
Neuro-muscular	Dr. Clara Limbaeck	x17141
Dermatology/Breast	Dr. Rathi Ramakrishnan	x30570
Cytopathology/Respiratory/ Gynaecological Pathology	Dr. Roberto Dina	x32444
Lymphoreticular/Haematopathology	Prof. Kikkeri Naresh	x33969
Renal Pathology	Prof. Terry Cook	x32009
Gynaecological Pathology	Prof. Mona El-Bahrawy	x33442
Gynaecological Pathology& Respiratory	Dr. Patrizia Viola	x31476
Haematopathology/ Respiratory/ Gynaecological Pathology	Dr. Saral Desai	x33292
Cytopathology/ Gynaecological Pathology	Dr. Priya Bhagwat	x31163
Renal Pathology	Dr. Candice Roufosse	x33280
Trophoblast/ Gynaecological Pathology	Dr. Baljeet Kaur	x38142
Trophoblast Pathology	Prof. Neil Sebire	X17153
Gynaecological Pathology& Respiratory	Dr. Nandita Gupta	x33930
Gastrointestinal/Breast	Dr. Kevin Lessey	x21646/x30891

Key Contact Numbers - St. Mary's Site

Laboratory Manager: Histopathology	Andrew Hay	x27850
Cytopathology	Rezzeline Mendiola	x26262
Duty Registrars		x12573
FNA Appointments Lump clinic: Contact Christine Mark and Khurram Aleem EBUS		 x21132 x21387
Frozen Section Booking		x21573
General Enquiries Histopathology		x21260
General Enquiries Cytopathology		x26831
Results Line		x35353
Fax Histopathology		x26775
Fax Cytopathology		x26609
Mortuary	Christine Dorsett & David Freeman	x21191 (Bleep 1146)

Key Contact Numbers - Charing Cross Site

Laboratory Manager	Nymeth Ali	x17131
Duty Registrars		x17690
Frozen Section Booking		x30554/ x17143
General Enquiries Histopathology		x17132/ x17139
Results Line		x35353
Fax Histopathology		x11364
Mortuary CXH		x17145
Electron Microscopy	Dr. Jill Moss	x17147

Key Contact Numbers - Hammersmith Site

Laboratory Manager	David Peston	x38147
Duty Registrars		x33968
Frozen Section Booking		x32289
General Enquiries Histopathology		x32289
Cytology Enquiries	Laxmi Batav	x33102
Results Line		x35353
Fax Histopathology		x33228
Mortuary		x34846
Haematological Molecular Diagnostics	Dr. Jamshid Sorouri-Khorashad	x32167
Immunophenotyping	Dr. Elisabet Nadal	x31505
Cytogenetics	Dr. Udayakumar Achandira	x32169

LABORATORY HOURS

The laboratories are open for inquiries between 9am and 5pm. There is no out of hour's service except for renal pathology at the Hammersmith site. Please discuss out of hours renal pathology requirements with either Prof. Terry Cook (ext: 32009) or Dr. Candice Roufosse (ext: 33280).

MORTUARY HOURS

St. Mary's site:
The Mortuary is open for undertakers and viewings Monday to Friday 10:00 – 16:00.

Charing Cross:
The Mortuary is open for undertakers and viewings Monday to Friday 10:00 – 16:00.

Hammersmith:
The Mortuary is open for undertakers and viewings Monday to Friday 10:00 – 16:00.
Closed for lunch 13:00-14:00.

There may be occasions where a release needs to take place out of hours, there are 'Out of Hours' procedures available on all sites for reference. This is performed by site operations managers. Arrangements can be made to accommodate this by contacting site operations managers on the appropriate site (HH Bleep – 9335, CXH Bleep – 1438**,** SMH Bleep - 1065).

SMALL URGENT SAMPLES – RAPID PROCESSING

Any specimen requiring an urgent result must be discussed with the duty SpR or relevant consultant in advance.
On all sites, urgent specimens must be received by 12:00 for same day results. For rapid renal biopsies, specimens must be received by 13:30.

Please be aware that rapid processing can only be performed on small biopsies and tru-cut needle cores. Discuss cases with the laboratory prior to sending specimens.

USE OF SERVICE

Please refer directly to p9 of this guide for instruction on how to make a Pathology request.

CLINICAL ADVICE

Medical advice is available if you uncertain about a particular test or the significance of any result. Contact the duty SpR or relevant consultant or clinical scientist by referring to the individuals listed in the key personnel telephone number section above. If you are a clinician at West Middlesex University Hospital NHS Foundation Trust (WMUH) please contact Cellular Pathology at WMUH as Cellular Pathology does not undertake the reporting of WMUH cases.

If seeking clinical advice and interpretation on a post mortem, contact the mortuary at St. Mary's in the first instance (x21191), they will then put you in touch with the relevant Pathologist presiding over the case.

For advice on a result from the Haematological Molecular Diagnostics Service (HMDS) laboratories please contact Dr. Jamshid Sorouri-Khorashad (x32167) with molecular queries, Uday Achandira (x32169) with cytogenetic queries and Dr Elizabet Nadal (x31505) with Immunophenotyping queries.

TECHNICAL ADVICE

For technical advice from a Biomedical Scientist, please contact the laboratories on the appropriate site (Hammersmith – x32289, Charing Cross – x30560, St. Mary's (Histology) – x21937, St. Mary's (Cytology) - x21387).

For general mortuary advice contact the appropriate site on (Hammersmith - x34846, Charing Cross - x17145, St. Mary's - x21191)

For advice from a member of the Haematological Molecular Diagnostics Service (HMDS) team please contact (Cytogenetics x32169, Immunophenotyping x31504, Molecular x32179)

REPERTOIRE, SAMPLE REQUIREMENTS AND TURNAROUND TIMES

The following repertoires are for all sites unless specified otherwise.

All specimens are to be transported in a sealed, leak proof container to the appropriate site or department as a matter of urgency according to the trusts transport guidelines. Specimens, particularly fresh specimens (including cytological preparations) should be taken with haste to the appropriate department as delays can have a detrimental effect on diagnosis.

If samples are being sent from an outside institution a suitably reputable courier company should be used and every effort made to ensure that the correct personnel have been informed of the specimens impending arrival.

Gynaecological Cytopathology

Cervical samples (SMH site)

The Cytology Department at the St. Mary's site examines cervical smears generated as part of the NHS cervical screening programme. The department uses ThinPrep® liquid based cytology (LBC) for the cervical samples. Supplies of LBC kits are available from the laboratory (x26831).

Ensure that the brush is rotated to ensure a 360 degree sweep of the cervix is performed. The collection broom must not be left in the sample pot.

There is a 14 day national target from date of collection to the woman receiving a result as set up by the NHS cervical screening programme. To ensure this target is met, specimens should arrive in the laboratory within two days of collection. To avoid delays of processing, samples must be labelled properly. Specimens over six weeks from date of collection will be destroyed.

The laboratories encourage smear takers to use pre-printed Open Exeter forms or OCS forms where available, otherwise use the standard HMR101 form to ensure all the demographics and clinical information are correctly given. Ideally this should include test date, LMP date, condition (i.e. pregnant, post natal, iucd fitted or on hormone therapy). Also include clinical data such as if the cervix is visualised.

Sample Storage
There is no requirement to store these samples overnight or the weekend in the fridge, they are stable at room temperature as the LBC solution is alcohol based. In order to maintain TAT they should be sent as soon as possible to the laboratory for analysis.

Personal Identification Number (PIN)
NHS England London will introduce a single London Cervical Sample Takers' Database in 2016. Once this is fully rolled out, all sample takers will need to include a valid PIN on request forms.

Direct referral
Following three inadequate results the Cytology Department will 'direct refer' the patient to the Imperial Colposcopy clinic.

Turnaround time–The laboratory monitors a target of 98% reported within 12 days from date of collection to authorisation of the report. This is to factor in two days for postal service to support the 14 day NCSP target.

Important note - If a woman is being recalled following a previous unsatisfactory result, a 3 month wait is recommended by the NHSCSP before the repeat smear is done to allow for the cervical epithelium to re-grow and for a truly representative sample to be taken. If this time is not adhered to the sample will be destroyed by the laboratory as there would be a high risk of a false positive or false negative result.

NHSCSP High Risk HPV testing Triage and Test of Cure
High risk HPV testing has been implemented in accordance with NHSCSP good practice guide number 3 (July 2011). This allows more targeted testing and a better service for women, faster resolution of abnormalities and faster return to normal recall.

The high risk HPV test (if required) is carried out on the residue of the cervical sample after the cytology slide has been prepared.

Triage: Samples are tested if the cytology shows borderline nuclear changes or mild dyskaryosis. Recommended management for the patient is dependent upon the result of the HPV test. If high Risk HPV is detected, the patient is referred to colposcopy (direct referral from the laboratory). If the HPV test does not detect any high risk HPV, the patient is returned to routine recall (3 or 5 years depending upon the age of the patient).

Test of cure: Applicable to samples following treatment for CIN (cervical intraepithelial neoplasia) when the cytology is negative, borderline nuclear changes or mild dyskaryosis. Management differs depending upon the HPV test result. If high risk HPV is detected, the patient is referred to colposcopy (direct referral from laboratory). If no high risk HPV is detected the patient is invited for her next cervical sample in 36 months (regardless of age).

Samples which show high grade dyskaryosis, ?invasive carcinoma, ?glandular neoplasia, or are follow-up samples following treatment for invasive carcinoma or CGIN (cervical glandular intraepithelial neoplasia) are not tested and do not fall into this pathway.

Samples for HPV testing are sent to Northwick Park currently as HPV analysis is not currently offered as a diagnostic service by NWL Pathology.

Out of Programme Samples

The laboratory follows guidance documents issued by NHSCSP regarding sample handling and sample rejection. Samples classed as being 'out of programme' will be discarded by the laboratory and the sender informed with the reason for the disposal and advice on the appropriate action to take. To avoid samples being discarded, please see the guidance below:

1 - Women under 25

Samples from women under 25 years of age, who have not been invited by the programme, will be classed as 'out of programme' if they have been taken earlier than 6 months before the woman's 25th birthday. *However*, tests should be accepted from women:

- under 25 who are on routine recall after previously being tested at 20 years in Wales, Scotland or Northern Ireland
- who are being followed up for previous abnormal cytology
- under 25 who are being followed up after having had an incidental biopsy showing CIN but have had no prior cytology
- samples taken by a consultant gynaecologist or colposcopist

If you are a sample taker in a GP/family planning clinic and are concerned there is a clinical reason for a woman to have a sample taken on a woman who would usually be considered out of programme, you are advised to refer her directly to colposcopy. Refrain from taking a sample in the clinic, as there is a risk the sample will be identified as out of programme and destroyed.

2 - Women 65 years of age and over

Samples from women 65 years of age and over will be classed as 'out of programme' unless:

- the woman has never had a cervical screening test and now requests one (which must be indicated by the sample taker on the request form)
- if the woman did not attend for her last invitation at 60 and now wishes to have that final test
- if her last three tests included an abnormal result and she is still in surveillance or follow up following treatment for CIN

3 - Women on 3 or 5 years recall

Samples from women 25-49 which are taken less than 30 months since a previous routine negative test, and those taken in women 50-64 less than 54 months since a previous routine negative test can also be considered 'out of programme'.

4 - Triage and Test of Cure

Where triage and test of cure has taken place, a sample should not be taken before the recommended recall. The laboratory will reject samples from women who have had an unreliable HPV test repeated in less than 6 months for triage samples and less than 3 months for test of cure samples.

5 - Vaginal vault

Vaginal vault cytology samples from women who have had a total hysterectomy for benign conditions or for non-cervical cancers (e.g. endometrial, ovarian) will be classed as 'out of programme' as vault cytology is no longer part of the screening programme. Women requiring vault cytology should be managed by their local colposcopy unit. *Vault samples taken by a consultant gynaecologist or colposcopist will processed and reported.*

6 - Military Personnel

Screening for military personnel is now part of the NHS Cervical Screening Programme. Due to the nature of the service and potential that women may be away at the time their test is due, screening intervals and testing dates may be modified by the sample taker. In order to avoid inappropriate rejection of tests taken in these circumstances, all tests taken at defence primary health care (DPHC) practices should be processed by laboratories.

It is strongly encouraged that the sample taker indicates on the request form that the testing date has been modified for operational reasons so that laboratories can differentiate these samples from any taken at an inappropriate interval and destroyed as they are viewed as out of programme.

Non-Gynaecological Cytopathology

Fine needle aspirates (FNA's)

The department offers a consultant performed FNA service for in-patients and patients attending OPD. A provisional report can be available immediately and a definitive diagnosis is usually available within 3 working days. Image guided FNA's submitted from radiology should be accompanied with a request form bearing the name and contact bleep number of the requesting clinical team.

SMH
Booking an FNA can be made through the cytopathology office (x26831/x21387) or preferably by liaising with one of the cytopathology consultants (x21674/x21293).

HH
Booking an FNA can be made through the cytopathology department (x33102/x33103).

CXH
Please refer directly to 'clinical FNA' below.

Clinical FNA's

There are occasions where FNA's will be performed by clinicians. This is routine at CXH as the slides are sent to HH for diagnosis.
Material obtained should be spread as thinly as possible onto 2 clean, clearly labelled glass slides. The remainder of the material should be washed into sterile saline or cytolyt solution available from the appropriate cytopathology department (SMH – x26831, HH/CXH – x33102/x33103).

It is important to note that submission of some material in a fluid base facilitates special stains and immunocytochemistry.

Advice on the best method of preparation is available by telephoning the appropriate department.

Slides produced from clinical FNA preparations should be sent to the appropriate cytology department (CXH specimens are handled by HH) clearly labelled. Write IN PENCIL on the slides the following patient identifiers: Patient Surname, Patient Forename, Date of Birth and Hospital Number or NHS Number.

Any questions or queries should be directed to the appropriate department.

Urines

Samples would not be rejected on the basis of small volume; however at least 1ml of *freshly voided mid-morning* urine is sufficient. The sample should be sent in a sterile container as soon as possible after collection. If a catheter specimen is taken or instrumented urine, this must be stated clearly on the request form. Mid-stream urine samples are **not** ideal for cytology investigation. If there is a delay in dispatch, store the sample at 4℃.

Sputums

Sputum specimens collected on three consecutive days should be sent to the laboratory immediately on production, or placed into a universal containing cytolyt for fixation. Avoid contamination with food, saliva, tobacco or toothpaste. Specimens after physiotherapy are particularly useful.

Bronchioalveolar Lavage (BAL)

BAL samples should be in saline if test requires differential count if not whole sample should be in cytolytes.
Any urgent PCP request must be discussed with the reporting Consultant and received in the laboratory no later than 15:00.

Serous cavity effusions, cerebrospinal fluid (CSF) and synovial fluids

Send all available material in a sterile container without fixative as soon as possible.
Urgent samples must be discussed with the reporting Consultant and received in the laboratory no later than 15:00.

Turnaround times for non-gynae cytology - The department aims to have 80% of results available in 7 calendar days and 90% of all results in 10 calendar days in accordance with guidance issued by the Royal College of Pathologists (RCPath).

Time limits for requesting further tests – Non-gynae cytology specimens are retained for a minimum of three working days. After this time the samples are discarded due to the natural process of cellular degradation that occurs over time. Samples processed for West Middlesex are returned to West Middlesex two weeks after receipt.

Histopathology

Routine Histopathology

Specimens must be placed in an adequately sized container, containing sufficient 10% formal saline/10% neutral buffered formalin (NBF) to cover the specimen. GP surgeries can obtain supplies by using the Pathology GP supplies form, call x35353 with queries. At SMH formalin is available in most wards and theatres, supplied by pharmacy. At CXH formalin is available from the histopathology laboratory x30554 and x30560. At HH formalin is available from the histopathology laboratory on x32284. (Note – endoscopy at HH supply their own pre-filled fixative bottles.)

Certain biopsies are better preserved using alternative fixatives e.g. testicular biopsies or phaeochromocytomas. These are available if required by contacting the appropriate laboratory site (SMH - x21937, CXH x17131/x30560, HH - 32289).

All specimen pots must be fully labelled with patient identity and nature of specimen or site of biopsy.

CXH breast specimens - Breast specimens are preferably sent fresh in a clearly labelled plastic bag, with a completed request form. If the specimen is likely to arrive outside of the laboratories normal opening hours the specimen should be placed into formalin and sent the next day, following discussion with either the lab staff or the relevant consultant. Further information can be obtained by telephoning the cut up room directly on x30554/17143.

Turnaround times for histology specimens (excluding cases requiring decalcification, referral or other additional investigations) – The department aims to have80% of results available in 7 calendar days and 90% of all results in 10 calendar days in accordance with guidance issued by the Royal College of Pathologists (RCPath).

Within the NHS Bowel Cancer Screening Programme (BCSP) requires 90% of lesions to be reported within 7 days in accordance with NHS BCSP Publication No 1.

Due to the complex interpretive nature of histopathology specimens these targets may not always be achievable.

Time limits for requesting further tests – There is no time limit for requesting further tests in Histology, but additional requests must be discussed with relevant consultant.

Products of conception (Including all pregnancy loss prior to 24 weeks gestation and surgical evacuations)

Written consent is required by the laboratory from a parent before histological examination can take place. An appropriately completed consent form (SD1 for under 13wks OR SD2/3 for 13-23wks available on all relevant wards and locations) MUST accompany the sample. If the form is not provided or is erroneous the specimen will be delayed in the laboratory while a resolution is sought. The statement of pre-viability must be signed by a doctor or midwife in order to allow the remaining material to be cremated.
Please note that pregnancy loss prior to 24 weeks gestation **does not** require a 'notification of death' to be completed. The only exception to this is if the infant was born prematurely and lived, the birth will then be registered and a notification of death would be required. Contact Patient Affairs or the mortuary if further clarification is required.

See also section 'Mortuary Services' below.

Rapid frozen sections

This service offers an immediate diagnosis on specimens from patients who are under anaesthetic.

Frozen sections are booked as far in advance as is reasonably practicable by calling the appropriate histopathology contact (SMH - x21573, CXH - x30554/17143, HH - x32289). At this time the reason for the frozen section must be given along with the patient's name, an approximate time of when the laboratory should expect the specimen to arrive, the surgeon and a contact telephone number.

All frozen sections must be arranged 24 hours in advance to ensure both laboratory and Pathologist staff are available.

When the specimen is taken it must be sent immediately in a dry container with a secure lid. Ensure to send the specimen with a properly completed request form with sufficient clinical details.Do not put any fixative (i.e. formalin) on the tissue. Results are telephoned to the contact number provided at the time of booking.

If the patient is in a high risk group this must be stated when booking the frozen section as frozen sections are not undertaken on certain high risk cases, e.g. TB and hep C. A frozen section will only be performed on HIV positive patients if their viral load is below 40 copies/ml. This result must have been on at least two consecutive occasions with the latest being within 1 month of the date of the frozen section. Proof of these results must be submitted in writing before the frozen section is to be undertaken. If you have any queries, contact the relevant histopathology laboratory to discuss well in advance of the planned procedure (SMH - x21573, CXH - x30560, HH - x32289).

If, at any time during surgery, it is decided that a frozen section is not after all required, please inform the laboratory immediately.

A result should be available within 30 minutes of receipt into the laboratory, this will depend on case complexity.

Immunofluorescence (IMF)

Skin biopsies from bullous lesions for immunofluorescence should be sent to the laboratory in special transport medium obtainable from the laboratory (CXH - x30554/30560).

For renal biopsies at Hammersmith, Nunc tubes filled with Transport Fixative are obtained from Histopathology (x32284) and must be used.

In all cases, IMF specimens must not be placed in any other fixative than that provided by the laboratory. The request form should be clearly marked for immunofluorescence/IMF.

Immunofluorescence is not undertaken on high risk specimens.

For high risk, refer to frozen section advice above.

Electron Microscopy (CXH site)

Samples for EM should be taken as small pieces into pre-dispensed Glutaraldehyde fixative. Please contact the laboratory on x30571 – 6th Floor lab block at Charing Cross to discuss obtaining fixatives or for any other questions.
Time limits for requesting further tests- There is no time limit for requesting further tests in EM, but additional requests must be discussed with the EM department.

Turnaround time- 95% are to be reported within 7 working days.

Muscle Biopsies (CXH site)

Currently these samples are not being reported at by NWL Pathology; please contact the CXH laboratory to discuss arrangements PRIOR to undertaking any procedure on a patient (x30560/x17131). *Courier arrangements are the responsibility of the referring establishment.*

A piece of saline-soaked gauze (NOT WET) should be jammed part way down a sterile disposable universal tube and the piece(s) of muscle (0.5-1cm maximum dimension) placed on the inside of the tube where it will stick. The muscle should not come into contact with the damp gauze or any drops of liquid on the side of the tube. The muscle biopsy MUST NOT be placed in formalin or any other solution. It should be sent as quickly as possible so that it arrives before 4pm on the same day. The histopathology department at Charing Cross should be informed both a day in advance and also on the day sent, to give the time the courier will arrive.

Bone Marrow Trephine (BMT) (HH site)

A correctly labelled sample needs to be placed into a universal container filled with Aceto-Zinc Formalin (AZF). This is available from Histopathology, call x32284.

Nerve Biopsies (CXH site)

A correctly labelled piece of nerve tissue, 1-2cm in maximum length should be sent fresh with a suture marking one end. This should be marked for the urgent attention of the Histopathology department, Charing Cross (x30560/x17131).

Renal Biopsies (HH site)

Renal biopsies are accepted into the lab in 10% Neutral Buffered Formalin, with additional pieces sent in transport medium for Immunofluorescence, and in Glutaraldehyde fixative for EM. (See above sections for Immunofluorescence and Electron Microscopy).

Research

All the above services are available to provide cellular pathology support for research projects. This service is chargeable and should be arranged with the relevant site laboratory (SMH - x27850, CXH - x17131, HH – x38147).

Mortuary Services

Transportation

The portering staff are responsible for the transportation of the deceased to the mortuary based on their site. Please refer to CEL-PP-005-M, CEL-PP013-X, CEL-PP-023-H or CEL-PP-78-C depending on site. The mortuary staff manage the training of portering staff and hold the training records in the mortuary office on each site. Training is undertaken according to CEL-PP-071-IMP, please call the appropriate mortuary to confirm when the next training session is scheduled.

Notifications of Death

Please note that all deceased adults require a fully completed Notification of Death even if there is no post mortem to be undertaken.

Fetus/infants will also require a fully completed Notification of Death even if there is no post mortem to be undertaken if:
A – The fetus is over 24 weeks in gestation (irrespective if live born or not)
B – The fetus is under 24 weeks in gestation and was live born

Please remember to list all particulars that accompany the deceased Notification of Death. Be mindful that even items of seemingly little value in monetary terms can be of enormous sentimental value to the deceased and their family and also need to be listed.

The pages are colour coded for their destination location for ease of use. The white copy is given to the porters upon collection of the deceased form the ward, the pink is placed in the slot on the body bag or taped lightly to the wrappings and the yellow copy goes into the patient notes. There is one final copy that needs to remain in the booklet.

If addressograph labels must be used on the forms, please remember to attach a label to each coloured copy. Additionally, pages are self-carbonated to assist accurate and speedy completion, remember to place the supportive card in the right place to allow the writing to be transposed onto all copies.

Where the Notification of Death has not been satisfactorily completed, mortuary staff will make contact with the sending ward and request a member of staff to attend the mortuary and undertake any corrective actions deemed necessary by the mortuary staff. It is the responsibility of the ward staff to ensure that if alterations are made to one copy of the Notification of Death all other colour copies are also updated, or if a new form is completed ensure all locations receive the new copy with instruction to destroy the old form.

Identification of the Deceased

The deceased must be fully and correctly identified by means of wrist or ankle tags. These tags must have the patients full name, date of birth and hospital number as a minimum.

Fetus/infants can be too small to have wrist/ankle tags. On these occasions it is permissible to tag carefully them around the abdomen.

In order for mortuary staff to be fully satisfied of the identity of the deceased tags must be attached and not placed loose within body bags or wrappings.

If there is any doubt regarding the identity of the deceased or if any inaccuracies, inconsistencies or omissions have been made either on the Notification of Death or the ID tags the mortuary staff will contact the ward the deceased came from. A member of the nursing team who was familiar with the deceased in life will be asked to attend the mortuary to make a positive identification and perform an appropriate corrective action as guided by mortuary staff.

Death certificates and advice

All issues concerning deaths in the Trust are dealt with by the Patient Affairs Offices on the relevant site (SMH - x21232, CXH – x11098, HH – x33075, C&W - x58650).Refer to them for any information relating to death certificates, cremation papers, Coroner's cases, and paperwork for post-mortem examinations, and body release.

Viewing arrangements

All sites have a facility within which the relatives of the deceased can conduct a viewing. To arrange this in hours contact the Patient Affairs Offices on the relevant site (SMH - x21232, CXH – x11098, HH – x33075, C&W - x58650). Out of hours contact the site operations managers on the appropriate site (HH Bleep – 9335, CXH Bleep – 1438,C&W Bleep – 0111, SMH Bleep - 1065).

Religious Watchers

During working hours it is possible for a watcher to sit with the deceased in the viewing room until their release into the case of their undertaker, which is likely to be quite prompt. Out of hours it is not possible to leave a non-member of mortuary staff in the mortuary complex, on these occasions arrangements should be discussed with the ward and site operations managers.

Forms Required for Sensitive Disposal of 'pre-viable' remains

Please refer to the following policies on the Imperial Trust intranet for full details:

- Sensitive Disposal of Fetal Tissue
- Paediatric/Perinatal post mortem examination consent and retention of tissues and organs policy
- Adult post mortem examination consent and retention of tissues and organs policy

When submitting Notifications of Death and consent forms it is important to make sure that all relevant sections are fully and accurately completed.

Under 13 weeks gestation:

- Histology required? – YES – Send the following to histopathology:
  - Fully completed original SD1 form
  - Histopathology request form
- Histology required? – NO – Send the following to the mortuary:

- Fully completed original SD1 form

Under 24 weeks gestation:

- Post mortem required – YES – Send the following to the mortuary:
  - Fully completed original SD2/3 form
- Post mortem required – NO – Send the following to the mortuary:
  - Fully completed original SD2/3 form

NOTE – A Notification of Death is not required for this gestational age. The only exception to this is if the infant was born prematurely and lived, the birth will then be registered and a Notification of Death would be required. Contact Patient Affairs or the mortuary if further clarification is required.

Post Mortems

Post mortem examinations may be requested where appropriate. Hospital post mortem's will be only conducted in the Imperial Trust on adults. Child or baby/fetus (over 24 weeks gestation) post mortems are undertaken by St. Thomas' Hospital.

In all cases the Post Mortem Consent MUST be obtained as outlined in Imperial Post Mortem Consent Policies, and at least one person signing the consent form must be a member of the Trust Core Post Mortem Consent team. A full list of team members can be found on the Source: http://source/prdcont/groups/extranet/@cpg/@clinical/documents/doc/id_027011.pdf

If a post mortem is consented the following documentation is required:

- An original completed, signed adult or baby/child consent booklet (available from Patient Affairs Office or via core consent team member)
- An original completed adult or baby/child information sheet (available from Patient Affairs Office or via core consent team member)
- The patient's notes
- A concise summary of the case.

If a consent form is found by the mortuary staff to be incomplete or erroneous they will make contact with the member of staff completing the consent. The post mortem will not be undertaken if there are any unresolved issues with the consent paperwork. Please be advised that this could delay funeral arrangements.

If an infant is stillborn, please ensure that the placenta is sent with the deceased directly to the mortuary.

It is possible to make alterations to post mortem consent or cancel a post mortem and there is a cooling off period that is observed. Refer directly to the post mortem consent policies for details on who to contact, timeframe and responsibilities. If you have any concerns contact the mortuary at St Mary's in the first instance on 020 331 21191.

There is body storage on the Hammersmith and Charing Cross sites only. All adult post mortem activity takes place at the St. Mary's Hospital site, this includes trauma cases. The mortuary at St. Mary's can be contacted on 020 331 21191.

Post mortems will not be carried out on apparent high risk individuals, although arrangements can be made for referral to Queens Square and other institutions as required.

Consent Training

Training is available for taking post mortem consent for adults and infants. Training is given in groups by way of presentation. Please e-mail sarah.horton8@nhs.net if training is required for your department. Cellular Pathology also maintain the consent team list, this is updated following every training session.

Out of Hours Viewing and Release Training

The mortuary staff are able to give training and refresher sessions to staff responsible for out of hours viewings and release of the deceased. Please contact the mortuary directly to arrange a session on x21191.

Coroner's Post Mortem

In certain circumstances deaths must be reported to the Coroner, i.e. patients dying within 24 hours of admission to hospital or dying within 24 hours of a surgical procedure. In these cases the Coroner will decide if a post mortem is required and make appropriate arrangements.

If a death is likely to be referred to the Coroner, it is vital that you leave all invasive devices *in situ*. These devices maybe capped or spigoted as appropriate to avoid leakage, but should cause minimal disturbance to the device. If in doubt, leave it in.

Incidents

The mortuaries are licensed by the Human Tissue Authority (HTA) and all activity undertaken must be lawful and within the bounds of the licence. CCTV is in use and will be reviewed when required. All incidents and concerns must be communicated to a member of management in Cellular Pathology using the contact list on p13.

REFERENCE LABORATORY DETAILS

At times, it may be necessary to refer work to other laboratories or consultants. The following organisations are periodically used:

Reference Laboratory
King's College Hospital, Denmark Hill, London, SE5 9RS (Tests = Alpha and Beta globin sequencing)
Mitochondrial NCG Laboratory, Newcastle University, NE2 4HH (Test = Muscle Histology)
The Doctors Laboratory, 60 Whitfield Street, London, W1T 4EU (Test = Gynae Cytology)
UCL Advanced Diagnostics, University College Hospital, London, WC1E6JJ (Test = Immunocytochemistry & Molecular diagnostics)
Royal Marsden Hospital, Fulham Road, London, SW3 6JJ (Test = Histology second opinions)
Selas Biomins, 17 et 19 Avenue Tony Garnier, BP7322, 69357 Lyon, Cedex 07 (Test = Cytogenetics)
Dubowitz Neuromuscular Centre, Queen Square House, Queens Square WC1N 3BG (Test = Muscle and neuropathology)
NGRL (Wessex), Salisbury District Hospital Salisbury, SP2 8BJ (Test = c-Kit and PDGFR1 mutation analysis)
Backlogs LTD, Silvaco Technology Centre, Compass Point, St Ives, Cambridgeshire, PE27 5JL (Test = Histopathology reporting)

Please refer to the United Kingdom Accreditation Service (UKAS) for details of accreditation. The laboratory periodically reviews the referral centres to ensure they are appropriate and meeting the needs and requirements of the service user.

In addition to the above it is sometimes necessary to seek a second opinion from a Consultant Pathologist external to the Trust for particularly complex cases. In this respect the department follows the cancer network guidelines. The details of the source of the specialist opinion are included in the final report.

Periodically Histopathology reporting of non-complex cases will be outsourced to Backlogs LTD. This company has been reviewed for suitability by the Laboratory Director. Outsourcing of work ensures that turnaround times are maintained during periods of increased workload. Reports which have been issued by Backlogs LTD will be identified as having been reported by Backlogs within the body of the report. All reports are rapid-reviewed by a North West London Pathologist and authorised on the Laboratory Information System in order for the result to be available to service users. In the footer of the report it will state "***Electronically Signed Out By Dr XXX – Consultant*** For Backlogs Pathologist.

If a service user has any queries about any aspect of a report please liaise with the Pathologist attending the MDT, or contact Pathology Queries (ICHC-tr.pathologyqueries@nhs.net) and the query will be forwarded to the relevant staff member.

Any work undertaken in another laboratory within any of the sites comprising North West London Pathology *is not* considered to be a referral.

INCOMING REFERRALS FOR PRIMARY, NETWORK OR SECOND OPINION IN HAEMATOPATHOLOGY

Referrals can be sent in the following forms:

1) Fresh tissue, or tissue in formalin or aceto-zinc formalin (only in the case of bone marrow trephine biopsies). Specimens should be properly identified by appropriate labels. If the specimen is being sent fresh, each case needs to be discussed and notified prior to sending and the sample should be received in our laboratory within 60 minutes of excision. Specimens in fixatives should be sent in appropriate amount of fixative and in a suitable container.
2) A H&E slide from each paraffin block and one representative paraffin block from the specimen
3) A H&E slide from each paraffin block and 15-20 unstained paraffin sections on coated slides (suitable for immunohistochemistry) made from one representative paraffin block of the specimen.

Please note that the referral note should include all relevant clinical information and available results of relevant investigations. Please also mention the contact details of the referring histopathologist, haematologist or physician with phone, fax and e-mail contacts.

Material should be addressed to:
Histopathology Department (for the attention of Professor Kikkeri Naresh)
1st Floor "G" block Pathology Centre
Hammersmith Hospital
Du Cane Road
London
W12 0HS

HAEMATOLOGICAL MALIGNANCIES DIAGNOSTICS SERVICE (Hammersmith Hospital)

Haematological Malignancies Diagnostics Service (HMDS) offers integrated immunophenotyping, cytogenetics and molecular pathology services. An integrated HMDS referral form is available via email to imperial.cytogenetics@nhs.net, imperial.immunophenotyping@nhs.net or imperial.moleculardiagnostics@nhs.net

CYTOGENETICS

We offer cytogenetic analysis for a wide variety of disorders, including:

- Acute myeloid leukaemia (AML)
- Acute lymphoblastic leukaemia (ALL)
- Myeloproliferative Disorders (MPD) including chronic myeloid leukaemia (CML)
- Chronic lymphocytic leukaemia (CLL)
- Myelodysplastic syndromes (MDS)
- CD138 plasma cell selection for plasma cell neoplasms such as multiple myeloma (MM)

We now offer an extensive formalin fixed paraffin embedded (FFPE) fluorescence in-situ hybridisation (FISH) for a variety of disorders including:

- Non-small cell lung cancer
- Oligodendroglioma
- Lymphoma
- Solid tumours

Opening hours:
The normal working hours for the laboratory are:-
Monday to Friday – 09:00 to 17:00
Bank Holidays, Saturday & Sunday – closed

Contact details:
For further information and clinical advice please contact: –

	Telephone	**email**
Main Laboratory (Result requests, clinical queries etc. – Ask to speak with a Clinical Scientist)	020 3313 2169	imperial.cytogenetics@nhs.net

Sending a sample for cytogenetic analysis:
Samples should be marked for the attention of the Cytogenetics Laboratory.

Cytogenetics Laboratory
2nd floor G-Block
Hammersmith Hospital
Du Cane Road
London
W12 0HS

Completion of requests:

Requestors should only refer cases when the clinical condition requires karyotyping or FISH for diagnosis, management and monitoring.

All samples must be sufficiently labelled with at least three patient identifiers, which match those given on the referral form. All samples must be accompanied by a referral form, available on the Pathology Website.

The date and time of the sampling should be mentioned on the sample vial or tube, and on the request form.

A summary of the clinical diagnosis must be mentioned on the request form, this will be used by the laboratory to determine the appropriate culture method and technique, and deliver a clinically useful result. If the patient has had cytogenetic testing previously or has already commenced treatment then details must be provided on the request form.

Occasionally the clinical scientists may wish to discuss the results with the requestor or seek some further information; as such a requestors contact number and email address must be provided on the request form.

Dispatch of samples to the laboratory:
Samples must reach the laboratory as soon as possible after sampling on the same day, especially following a bone marrow aspiration.

Samples may be couriered or posted first class to the address above. Please note, samples must be packaged, transported and labelled in accordance with National guidelines.

Sample requirements:

- Samples would not be rejected on the basis of small volume; however, ~5mls is ideal.
- Bone marrow is the sample of choice, the type of sample must be clearly stated on the request form
- Peripheral blood in lithium heparin may be suitable if there are circulating blasts and/or a high WBC
- Peripheral blood in EDTA is only suitable for samples requiring FISH tests alone and would not be suitable for chromosome analysis (Karyotyping)
- Samples which are non-sterile, clotted or collected in sodium citrate, fixative or saline are not suitable
- FFPE cases sent for FISH must have marked H&E slide, at least three identifiers, tumour content details and block ID, on the request form. Also each FFPE slides must be labelled with at least three identifiers which match the corresponding request report. Requestors must send 5 slides for ERRB2 and AKL, and 6 slides for lymphomas

Delayed transport:

- Samples should arrive in the laboratory as soon as possible after sampling. Samples delayed in transit may yield poor quality results, or be rejected as unsuitable.
- To ensure the laboratory have sufficient time to set up the test, samples need to arrive in the laboratory no later than 15:00 where possible
- Please note that the laboratory is closed Bank Holidays and over the weekend, so if sending a sample on the last day of the working week, please ensure it reaches the laboratory by the late afternoon.

Indications for analysis:
Conventional and/or cytogenetic analysis of certain bone marrow samples is only relevant when there is evidence of infiltration of the bone marrow. Lymphoma samples, for example, are therefore cultured but not usually analysed until we have information regarding the bone marrow infiltration status from morphological analysis of the aspirate or a corresponding bone marrow trephine biopsy.

Results:
The results of internal samples that are electronically requested on Cerner OCS for examination will be available on Cerner OCS for viewing as explained from page 6 onwards.

External results will be sent electronically to an NHS.net e-mail address or a fax number if requested. This will be followed up with a printed report that will be sent via the post.

Reporting times:
The department is committed to meeting the reporting time guidelines recommended by the Association for Clinical Cytogenetics:

- Urgent referrals (acute leukaemia and CML):
    - 95% should be reported within 14 calendar days
- Rapid test by FISH:
    - 95% should be reported within 3 working days
- Routine referrals:
    - 95% should be reported within 21 calendar days

Other tests:
Fanconi Anaemia
Please note: this laboratory no longer performs chromosome breakage testing for Fanconi anaemia (FA). Samples for chromosome breakage testing, including FA, ataxia telangiectasia (AT), Nijmegen breakage syndrome (NBS), Roberts syndrome (RS) and Bloom syndrome (BS) should be sent to:

Mr. Ian Kesterton
Cytogenetics
5th floor Tower Wing
Guy's Hospital
Great Maze Pond
London
SE1 9RT
T: 020 7188 1701
F: 020 7188 1697
E: ian.kesterton@gsts.com

Please note: this laboratory performs G-banded chromosome and FISH analysis for acquired cytogenetic abnormalities (leukaemia, lymphoma and solid tumours). Samples referred with a suspicion of a constitutional chromosome abnormality (including recurrent miscarriage couples, patients with developmental delay and prenatal referrals) should be sent directly to the North West Thames Regional Genetics Service at Northwick Park Hospital, Level 8V, Harrow, HA1 3UJ.

IMMUNOPHENOTYPING (FLOW CYTOMETRY) LABORATORY

Performs flow cytometric analysis for a wide variety of disorders, including:

Acute myeloid leukaemia (AML)
Acute lymphoblastic leukaemia (ALL)
Myeloproliferative Disorders (MPD)
Chronic lymphocytic leukaemia (CLL)
Myelodysplastic syndromes (MDS)
Aplastic anaemia and other pancytopenias
Plasma cell disorders
Lymphocytosis
Investigation of CSF samples or effusions
Investigation Paroxysmal Nocturnal Haemoglobinuria (PNH)

Opening hours:
The normal working hours for the laboratory are:-
Monday to Friday – 09:00 to 17:00
Bank Holidays, Saturday & Sunday – closed

Contact details:
Main Laboratory (Urgent Sample Intimation and Results)
Tel: 020 331 31504
Email: imperial.immunophenotyping@nhs.net

Sending a sample for flow cytometry analysis:
Immunophenotyping
2nd Floor G-Block
Hammersmith Hospital
Du Cane Road
London
W12 0HS

Completion of requests:
Clinical details are essential to enable the laboratory to decide which panels or groups of specific antigens testing to perform. Patient history is crucial to diagnosis; a completed HMDS request form detailing infection risk, sample date and time, clinical details, test requirements and the correct three patient identifiers should accompany all specimens.

All samples should be accompanied by a request form: Copies available via email to imperial.immunophenotyping@nhs.net

Dispatch of samples to the laboratory:
Internal samples, taken in the haematology outpatient's department (HOPD) or on wards, should be placed in the cytogenetics tray in the nurses office in the HOPD. Outside of hours, if this tray is inaccessible, samples may be left with Pathology Specimen Reception in G-block. Samples should reach the laboratory as soon as possible after sampling. Internal samples are collected daily from the Haematology Out Patients Department.
External samples may be couriered or posted first class to the address above. Please note, samples must be packaged, transported and labelled in accordance with National guidelines.

It is the responsibility of the requesting doctor to ensure that the specimen reached the laboratory. For urgent specimens, please notify the specimen reception staff and technical team of the urgent status of the specimen in advance.

Specimens should arrive in the laboratory as soon as possible after sampling. Ideally, samples should arrive in the laboratory no later than 15:00.

Blood and bone marrow samples delayed in transit for more than 3 days may yield poor quality results. Cerebrospinal fluid, plural effusion, ascetic fluid and tissue biopsy in transit for more than 1 day may yield no result; for these samples, please transport to the laboratory on the day of collection for arrival before 15:00 or add **TransFix®** (cellular antigen stabilising reagent), refrigerate overnight and transport the samples on the following day.

PNH samples, taken within 48 hours of testing, must arrive at the laboratory before 15:00 on Fridays.

Internal samples taken at Hammersmith Hospital
Please bring specimens to Room G303, 2nd floor G Block North in the first instance. If this is not possible, please call the technical team on x31504/x31501/x31505 for assistance. The reception team collects specimens from the blue tray labelled 'SIHMDS' in the nurse's office in the Catherine Lewis Centre at 11:00 and 14:00 only.

Internal samples taken at Charing Cross, St. Mary's and Chelsea and Westminster Hospitals
For urgent samples, please arrange a courier to deliver the package to Immunophenotyping, 2nd Floor G Block, Hammersmith Hospital, Du Cane Road, London, W12 0HS. For routine samples, there are scheduled collections at Pathology Specimen Receptions at each site.

External samples including Hillingdon Hospitals and West Middlesex University Hospital
Please arrange a courier to deliver the package to Immunophenotyping, 2nd Floor G Block, Hammersmith Hospital, Du Cane Road, London, W12 0HS.

Out of hours
For internal samples that were taken at Hammersmith Hospital, please bring specimens to Room G303, 2nd floor G Block North. Time stamp the request form and place the specimen in the Room G303 fridge in the green tray labelled 'Overnight samples'. Please note that cerebrospinal fluid, plural effusion, ascetic fluid, and tissue biopsy in transit for more than 1 day may yield no result; for these samples please add **TransFix®** (cellular antigen stabilising reagent) and refrigerate overnight.

Alternatively, ahead of the procedure, visit the Immunophenotyping team on 2nd Floor G Block and pick up a sterile universal container that has **TransFix®** added and use this pre-prepared container for the sample collection.

For external samples, please timestamp your parcel and hand in the package at Ground Floor, G Block Specimen Reception. Please notify the specimen reception staff and technical team the priority

status and temperature storage requirements of the specimen. On the next day, please contact the Immunophenotyping team (x31504) to ensure the sample has been received.

Sample requirements:
Cell Markers (Immunophenotyping)
For optimal results:

Peripheral blood/bone marrow	1mL – 5mL in EDTA (lavender top)
Cerebrospinal fluid/plural effusion/ascetic fluid/tissue biopsy	1mL – 5mL in saline or **TransFix®** in sterile universal container

Paroxysmal Nocturnal Haemoglobinuria (PNH)
For optimal results:

Peripheral blood	1mL – 5mL in EDTA (lavender top) taken within 48 hours of testing

Samples will not be rejected on the basis of small volume. Specimens should be labelled with at least 3 patient identifiers and the sample taken date and time. A HMDS request form must be sent with the sample.

Delayed transport:
Samples should arrive in the laboratory as soon as possible after sampling, ideally samples need to arrive at the laboratory by 16:30.Samples delayed in transit for more than 3 days may yield poor quality results, or be rejected as unsuitable.

Please note that the laboratory is closed Bank Holidays and over the weekend, so if sending a sample on the last day of the working week, please ensure it reaches the laboratory by the late afternoon.

Results:
Internal results are available via the laboratory internal computer system (LIMS) and are automatically transferred to Cerner or Lastword as appropriate.

External results are sent electronically to the referrer's NHS.net e-mail address.

Reporting times:
Urgent referrals – 95% within 1 calendar day
Semi-Urgent - 95% within 3 calendar days
Routine - 95% within 7 calendar days

MOLECULAR PATHOLOGY LABORATORY

The Molecular Pathology Laboratory aims to provide molecular genetic testing, where relevant, for several disorders and mutational analysis for CRC, NSCLC, melanoma and GIST.

Molecular testing for BCR-ABL1 (Philadelphia chromosome):

This service is offered internationally and we often receive samples from a patient as they attend different centres, to assist with this, printed transport details and request forms are available, please contact the laboratory.

TEST	Sample requirements	Turnaround Time	COMMENT
PCR at diagnosis to determine BCR-ABL1 transcript type.	**Container: EDTA (purple)** 20mls of peripheral blood OR 2.5-5 ml bone marrow **MUST be received within 72 hours from collection** **NB: (the lab is not open at weekends)** The date and time sample was taken must be legible.	**10 working days**	All known transcript types are tested for by multiplex PCR.
Monitoring of BCR-ABL1 by Q-PCR.		**10 working days**	Expressed as a ratio of BCR-ABL1 to ABL1 determined by Q-PCR. Interpretation is dependent on identifying transcript type at diagnosis
Mutation analysis of the ABL1 tyrosine kinase domain		**20 working days**	Sequencing to identify known molecular causes of resistance to BCR-ABL1 tyrosine kinase inhibitor treatment.

BCR-ABL1 Results:
Internal results are available via the “new cytogs” database as soon as they are ready. The database is located on the N:/ drive of the Trust computer network; please contact the laboratory for instructions on how to access this. We have started to transfer our data to Sunquest system for reporting. External results are sent by email as soon as they are ready; if the result is urgent please contact the laboratory.

Other tests offered:
The following tests have a two week turnaround time or 10 working days. Exceptions to this are Beta globin gene analysis and G6PD deficiency. The target turnaround times for these tests are stated below.

AML MRD
qPCR for *NPM1* MutA, t(8;21), inv(16) and t(15;17).

Alpha thalassaemia
Identification of the common alpha thalassaemia deletions (-3.7 and -4.2, SEA, Med, Fil,Thai and -20.5) detected by GAP-PCR.

Triplicated alpha globin analysis
Identification of the anti-3.7 triplication of the alpha globin gene. This is performed by PCR.

Beta globin gene analysis
Identification of mutations in the beta globin gene. This is performed by Sanger sequencing. NOTE This has a turnaround time of 4 weeks/20 working days.

Xmn I polymorphism
Identification of a polymorphism in the gamma globin gene which is linked to the prognosis of Sickle cell disease. This is detected by PCR and restriction enzyme digestion.

Factor V Leiden and Prothrombin gene mutations
We genotype relevant samples for these polymorphic thombophilia risk factors.

Gene rearrangement studies
Abnormally large lymphocyte clones can be detected by the presence of their rearranged immunoglobulin or T cell receptor genes. Clonality analysis is performed by Genescan analysis in peripheral blood/bone marrow and FFPE samples.

Chimerism studies
The proportion of donor DNA in post-transplant samples is detected by a semiquantitative amplification of informative microsatellites in whole blood and T cell selected samples using PCR and Genescan. NOTE – Repeat chimerism tests should not be requested until 20 days between tests has elapsed to ensure the result is useful and meaningful in confirming relapse. Early testing will result in misleading results.

G6PD deficiency
The common polymorphic variants (Med, A-202 and A-928) causing G6PD deficiency are detected by PCR and restriction enzyme digestion. If these are not identified, further analysis of the G6PD gene will be performed by Sanger sequencing. This has a turnaround time of 4 weeks/20 working days.

Diamond–Blackfan anaemia (DBA)
It is an inherited pure red cell aplasia and as inherited erythroblastopenia is a congenital erythroidaplasia that usually presents in infancy. DBA causes low red blood cell counts (anaemia), without substantially affecting the other blood components (the platelets and the white blood cells), which are usually normal. We analyse nearly 80 genes for various mutations using home-developed DBA panel performed using ion torrent.

MPN
Identification of the V617F polymorphism in patients with MPN. *Jak2* Exon 14 mutation studies analysed by NGS which allows for quantification. Targeted NGS is performed for 13 genes implicated in myloproliferative neoplasms. The panel covers sequencing of *Jak2* Exon 12 and 14; MPL Exon 10; and CALR1 Exon 9 type 1 mutations and hotspots in another 10 genes important for the diagnosis and treatment of MPN patients.

Myeloid panel
Targeted NGS is performed for hotspots in 54 genes implicated in myeloid malignancies.

NPM-1/FLT3
Mutations are used in the diagnosis and prognostic classification of MDS/AML patients. Mutation analysis is performed by PCR and genescanning.

UGT1A1
The Detection of UGT1A1 Promoter Mutation in patients with Gilberts syndrome using PCR and Genescan.

Solid tumour panel genes
The Ion Torrent Cancer Hotspot Panel (v2) is used for prognostic and predictive testing of solid tumour samples. Included in this 50-gene panel are well-documented *KRAS, BRAF, NRAS, EGFR,*

KIT and PDGFRα variants that are implicated in a range of solid tumours, including melanoma, GIST, lung and colon cancer.

Calreticulin mutation screening
This assay is designed to identify frames shift mutations (deletions, insertions, or both) within Exon 9 of the Calreticulin gene in Jak2 V617F negative MPN patients using genescan mutation screening by fluorescent PCR fragment analysis.

Specimen Requirements
(it is recommended samples arrive in the laboratory within 72 hours*)

Alpha and Beta thalasseamia & G6PD deficiency	**>1ml EDTA blood**
Xmn I polymorphism	**>1ml EDTA blood**
Factor V Leiden and Prothrombin gene mutations	**>1ml EDTA blood**
JAK2 V617F	**>1ml EDTA blood or bone marrow**
DBA	**>1ml EDTA blood**
UGT1A1	**>1ml EDTA blood**
Gene rearrangement studies	**3ml blood, >1ml bone marrow <72hrs old, FFPE tissue**
NPM1	**>1ml EDTA blood or bone marrow***
Chimerism studies (including T cell separation)	**>1ml EDTA blood or 5 ml bone marrow**
Solid tumours	**FFPE blocks, sections or cut rolls (cut using contamination avoidance techniques), isolated DNA (20ng/ul)**

Note: if the blood counts are abnormal (high or low white cell count) the volumes of blood requested should be adjusted accordingly.

***Samples for *BCR-ABL*, chimerism, gene rearrangement and AML MRD must be received within 72 hours from collection.**

Contact Information:
All enquiries and samples should be sent to:

Dr. Jamshid Sorouri-Khorashad (x32179)
c/o Pathology Specimen Reception
G-block Pathology Centre
Hammersmith Hospital
Du Cane Road
London
W12 0HS
Tel: 020 331 32179
Email: imperial.moleculardiagnostics@nhs.net

The normal working hours for the laboratory are:-
Monday to Friday – 09:00 to 17:00
Bank Holidays, Saturday & Sunday – closed

It is recommended that samples sent by post are sent (first class) on Monday to Wednesday only. All samples must arrive no later than 3pm on Fridays. Samples must be accompanied by a completed request form indicating: patient's full name, DOB and hospital number, sample type, the test requested with relevant clinical details, name of referring consultant to whom the results should be sent. Samples must be labelled with at least three patient identifiers (full name, DOB & hospital number).

CLINICAL BIOCHEMISTRY, BLOOD SCIENCES DEPARTMENT

DESCRIPTION OF SERVICE

Clinical Biochemistry is a service within the Blood Sciences Department.
Core Clinical Biochemistry laboratories providing both routine and out of hours services are located on each of the four sites. Specialist services including Metabolic, Specialist Endocrinology, Oncology, Trace Elements, Renin and Aldosterone, and Bone Marker services are provided from Charing Cross Hospital. The Gut Hormone Laboratory and the Andrology diagnostic service are located at the Hammersmith Hospital site.

LOCATIONS

Charing Cross Hospital
The main automated Clinical Biochemistry laboratory and Specimen Reception are located on the first floor of the Laboratory Block.
Specialist services and the Oncology laboratory are located on the 8th and 12th floor of the laboratory block.
The Trace Element services operate from the ground floor of the Oncology block.

Hammersmith Hospital
The Clinical Biochemistry Laboratories and Specimen Reception are located in the Pathology Centre, Area G, Hammersmith Hospital.
The Gut Hormone Lab is located on the 6th floor of the Commonwealth Building.
The Andrology Laboratory is located in Area C on the ground floor of the hospital.

Chelsea & Westminster
Clinical Biochemistry and Specimen Reception are located on the 2nd floor (Lift Bank D).

St Mary's Hospital
Clinical Biochemistry and Specimen Reception are located on the 2nd floor of the Mint Wing.

KEY PERSONNEL/CONTACT NUMBERS

Blood Sciences Department		
Divisional Manager	**Charlotte Mustoe**	**35908**
Central Administration Office		**35906/07**

Clinical Biochemistry Contacts	**Bleep**	**Extension**
Charing Cross Laboratory	8161	
Hammersmith Laboratory	9022	
Chelsea and Westminster Laboratory	0143	
St Mary's laboratory	1022	
Clinical advice (09:00-17:30, Mon-Fri)		**30348**
Call Centre Results (09:00-17:00, Mon-Fri)		**35353**

Consultants		Contact details
Prof Tricia Tan (Clinical Biochemistry Clinical lead)	38038	tricia.tan@nhs.net
Mrs Sophie Barnes (Consultant Clinical Scientist)	15183	sophiebarnes@nhs.net
Dr Emma Walker (Endocrinology)	35921	emma.walker15@nhs.net
Nicholas Martin (Trace Elements)	33644	nicholas.martin1@nhs.net
Dr Richard Harvey (Oncology)	11400	richard.harvey2@nhs.net
Dr Jaimini Cegla Dr Shivani Misra	26832	j.cegla@nhs.net s.misra@nhs.net

Key information for each site

Charing Cross Routine Service- Ground/1st floors, Lab Block

	Name	Extension	Bleep
Site Manager	Mike Lyall	17128	
Clinical Biochemistry Lead	Carmel Wood	17062	
Laboratory		17004	8161

Hammersmith- G Block, North Corridor

	Name	Extension	Bleep
Site Manager	Andy Osei-Bimpong	31946	
Clinical Biochemistry Lead	Ela Biegun-Laroy	32109	
Laboratory		32113	9022
AndrologyLaboratory Manager	Lia Joannou	33598	
Gut Hormone Enquiries		33949	

Chelsea and Westminster- Level 2, Pathology

	Name	Extension	Bleep
Site Manager	Linda Wildridge	58094	
Clinical Biochemistry Lead	Dunstan Vincent	58092	
Laboratory		55133	0143

St Mary's-2nd floor Mint Wing

	Name	Extension	Bleep
Site Manager	Lorry Phelan	21687	
Clinical Biochemistry Lead	Amy Thomas	21343	
Laboratory		21309	1022

Charing Cross Specialist Service-8th/12th floors, Lab Block

	Name	Extension	Bleep
Site Manager	Vijay Ramanaidoo	33696	

Information on repertoire, reference ranges and turnaround times is listed on the Pathology website:
www.NWLPathology.nhs.uk

CLINICAL INTERPRETATION

Advice and interpretation is available during working hours from the Duty Biochemists (0203 313 0348). Senior clinical and scientific staff are available in the laboratories at all times by bleep, telephone (see key contacts above) or direct contact.
Requests for clinical advice emailed to Pathology Queries ICHC-tr.pathologyqueries@nhs.net or through the Pathology Queries form on the website, are monitored during working hours and forwarded to clinical specialists for assistance.

LABORATORY HOURS

Routine Service 09:00 - 17:30 Monday to Friday

In and out patient samples requesting common tests are resulted the same day. Samples from GPs are resulted within 24 hours of receipt. Requests for specialised tests may take longer.

Out-of-hours Service

17:30 - 09:00 Monday - Friday
Saturday, Sunday and Bank Holidays
Note: A restricted range of tests is available out of hours. Additional tests may be performed after discussion with the on-call consultant.

Poisoning:

Paracetamol and Salicylate. Samples for paracetamol must be drawn at least 4 hours after ingestion.

If you are a healthcare professional and need emergency advice, please access TOXBASE® or contact the National Poisons Information Service using the telephone number listed on TOXBASE®.

Urgent Service

Charing Cross, Hammersmith Hospitals and St Mary's Hospitals
09:00 - 17:30 Monday – Friday
Urgent requests must be clearly identified as urgent and should be limited to those required for immediate patient management. It is not necessary to inform the laboratory of urgent work sent between 9am and midnight however if there is something particular you wish to convey to the lab about an urgent sample then telephone the laboratory.
Please note a sample with an OCS 'UI' label will not be treated as urgent unless a call regarding the sample is received.

Chelsea & Westminster Hospital
09:00 - 17:30 Monday – Friday
Apart from A&E, all urgent requests must:
1. Be notified to the laboratory by telephone (55133)
2. Be requested as STAT on EPR
3. Have a bleep number on the request form.
4. Be put into the specimen bag so that the STAT message is visible.

URGENT AND OUT-OF-HOURS INVESTIGATION

This service is provided only for situations where investigations are urgently required to aid the immediate management of the patient. This will apply to acute admissions and forward patients whose condition has deteriorated. The investigations available for this service are listed below. Any other request may be referred to the Special Registrar (SpR)/Consultant on duty with whom you can discuss the investigation of your patient. Additional non-urgent requests can be provided later on the same sample submitted for urgent investigations if this requirement is indicated at the time of the initial request.

Alanine Transaminase (ALT)
Albumin
Alkaline Phosphatase
Ammonia
Amylase
Aspartate Transaminase (AST)
Bicarbonate (TCO2)
Bile acids (total)
Bilirubin
Blood gases
B-Natriuretic Peptide (BNP)
C-reactive protein (CRP)
Calcium
Chloride
Cholesterol
Cortisol
Creatine Kinase (CK)
Creatinine
Digoxin
Ferritin
Gamma glutamyl transferase (GGT)
Globulin
Glucose
HCG (pregnancy)
HDL Cholesterol
Immunoglobulins G,A,M
Iron
Lactate
Lactate dehydrogenase (LDH)
LDL Cholesterol
Magnesium
Oestradiol
Paracetamol
Phenobarbital
Phenytoin
Phosphate
Potassium
Protein (Total)
Salicylate
Sodium
Theophylline
Thyroid function tests
Transferrin saturation
Triglyceride
Troponin
Urate
Urea

Urgent Osmolalities:

The Laboratory must be notified by bleep to arrange for serum or urine osmolalities to be run as urgent samples.

Additional tests may be added to requests by arrangement with the lab depending on analyte stability and sample availability. Routine samples are normally discarded after 72 hours.

NOTES ON SPECIFIC INVESTIGATIONS

For information on specialised assays please contact the Duty Biochemist on 30348 or visit the North West London Pathology website here.

- **CSF Analysis** Specimens heavily contaminated with blood will not be analysed.
- **CSF spectrophotometry** is available out of hours on Saturday, Sunday and Public Holidays between 09:00 and 14:00. The SpR/Consultant on call should be contacted to arrange analysis outside these times.
  Please note: these samples should be delivered to the lab by hand as transport by pod (PTS) may cause degradation and affect the result.
- **CSF Glucose** For evaluation of CSF glucose, plasma glucose analysis should be requested on a specimen collected at about the same time.
- **CSF Oligoclonal Proteins** To enable interpretation it is imperative that serum levels should be assayed concurrently. It is then possible to distinguish increased IgG production within the nervous system from increases due to leak from the circulation. CSF samples without corresponding serum samples will not be sent for immunoglobulin analysis.

- **Pleural Fluids** The samples should all be treated as high-risk samples. Requests for glucose and protein levels should be sent in a fluoride and heparin sample respectively. pH will not be analysed in the laboratory but samples will be centrifuged for collection and analysis on a Blood Gas Analyser.

Monitoring therapeutic drugs

1. **ANTICONVULSANTS AND THEOPHYLLINE**
   (Carbamazepine, Phenobarbitone, Phenytoin).
   - Routine monitoring of Valproate therapy is not appropriate.
   - All assays use serum (yellow top tube)
   - Samples are best taken just before an oral dose
   - Please give details of:
     THERAPY: Drugs, Dose, Frequency, Date & Time of last dose; Time of sample taken
     CLINICAL: Patient's weight (Kg); Type of fit & frequency; Toxic side effects, etc

   Following a change in therapy it is essential to allow time for re equilibration at the new dose - for Phenytoin this is about 3 weeks.
2. **DIGOXIN** - collect specimen at least 6 hrs after last dose.
3. **LITHIUM** - collect specimen 12 hrs post dose

Investigation of drug abuse

Whenever a patient is admitted suspected of suffering from the effect of a drug, the appropriate specimens should be collected for medico-legal purposes in addition to those required for patient management and sent to the laboratory for storage for 2 weeks. **LABEL CLEARLY 'CORONERS SAVE'.**

These specimens are:

1. 50 mLs of first urine obtained.
2. First gastric washings (if available)
3. 10 ml of heparinised blood

The Clinical Biochemistry laboratory screening test for drugs of abuse is not suitable for medico-legal purposes. The Laboratory does not provide chain of custody.

Coroner and Police requests for samples

If you are contacted by the coroner's office (or police) about saving patient specimens or think that specimens may be required for this purpose, please obtain the name(s), date(s) of birth and hospital number(s) used by this patient during this hospital visit.

Please contact all laboratories to which samples have been sent. Provide them with the above details making it clear that samples are to be saved for the Coroner.

The laboratory must be contacted within 72 h of receipt of routine samples for guaranteed sample retrieval and storage. Any samples identified will be saved at 2-8°C for one month. If there is no further contact from the requesting authority within this time, the sample will be destroyed.

Specialised paediatric/metabolic investigations

Clinical staff should consult the Duty Biochemist before embarking on these (30348). A variety of blood specimens may be required. White cell enzymes require 5-10 mL heparinised blood and due to preparation necessary prior to analysis, samples cannot be accepted by the Laboratory after 1pm on a Friday. Lactate/pyruvate ratio and CSF dopamine metabolites require the presence of laboratory staff

at the bedside. This must be arranged in advance by bleeping the Point-of Care team on 9611 or 9606 (Hammersmith Hospital) or 5942 (Charing Cross Hospital).

Analyses performed on Urine

24 hour collection containers, plain and acidified are available from the laboratories.

Analyses performed on other Fluids

Many of the tests listed above are also performed on other fluids, please contact the Laboratory to confirm turn-around times and reference ranges.

Pre-analytical Factors that may affect Clinical Biochemistry results

Pre-analytical Factor		Analytes affected
Haemolysed sample		Potassium, urate, magnesium, LDH, total protein, ammonia (Please note; the level of the haemolysis may affect individual analytes to different extents.) Xanthochromia (CSF)
Delay in separation/ receipt in laboratory	4 hrs	PTH, renin
	6 hrs	BNP
	8hrs	Potassium, phosphate, bicarbonate
	24hrs	Sodium, chloride, magnesium, creatinine AST, LDH, iron
	48hrs	Urea
	72hrs	Bone profile (total protein, calcium, albumin, alkaline phosphatase) Liver function (ALT, albumin, alkaline phosphatase, bilirubin, total protein) GGT, amylase Lipid profile (LDL-cholesterol, triglyceride) Uric acid Iron, transferrin CK
Particular collection requirements	Protect from light	Porphyrins (plasma and urine) Vitamin A, Vitamin E Xanthochromia (CSF)
	Avoid transport by Pod (PTS)	Xanthochromia (CSF)
	On ice, rush to lab	Ammonia, calcitonin, gut hormones, insulin, C-peptide, ACTH, PTHrP
	Special sample tube	Aluminium, zinc
	Acidified (pH<3.0) urine collection	Catecholamines, metadrenalines, calcium, oxalate, phosphate, 5-HIAA
	Keep warm (37 C)	Cryoglobulins
Dietary requirements	Fasting	Gastrin
	Various influences	5-HIAA (urine) please contact Duty Biochemist for full details
Diurnal variation		Cortisol, ACTH, bone markers, testosterone
Sampling time post event	>4 hrs	Paracetomol (post ingestion). See CHM 2012 Guidelines for use of acetylcysteine
	> 6 hrs	Digoxin (post dose)
	>12hrs	Troponin I (post onset of chest pain) Lithium (post dose)

WHO (1999) guidelines for the diagnosis of diabetes mellitus: (venous plasma samples)

Random Glucose: <6.1 – DM excluded. >11.0, with symptoms - DM confirmed.
Fasting Glucose: <6.1 – DM excluded. >6.9 - DM confirmed. 6.1-6.9 – impaired fasting glucose.
OGTT 2hr sample:<7.8 – no IGT. >11.0 – DM confirmed. 7.8 - 11.0: Impaired Glucose Tolerance (IGT)

Type 1 DM: NICE CG15. Target HbA1c 59 mmol/mol without frequent disabling hypoglycaemia, consider ≤ 48 mmol/mol where there is high arterial risk.
Type 2 DM: Diagnosis WHO: ≥ 48 mmol/mol with second indicator (either symptomatic or laboratory).
Type 2 DM: Treatment NICE CG66: Target 48-59 mmol/mol

Reference Laboratory Details:

At times, it may be necessary to refer work to other laboratories or consultants. The department routinely sends work to the following organisations:

Birmingham Women's Hospital	Birmingham, West Midlands B15 2TG
City Hospital Birmingham	Birmingham B18 7QH
Ealing Hospital NHS Trust	Uxbridge Road, London, UB1 3HW
Glasgow Royal Infirmary	Glasgow,G4 0SF
Great Ormond Street Hospital	London WC1N 3JH
Guy's Hospital	London SE1 9RT
Health and Safety Laboratory	Harpur Hill Buxton, SK17 9JN
Sheffield Northern General Hospital	Sheffield S5 7YT
Institute of Child Health	London WC1N 1EH
Kennedy Galton Centre, Northwick Park Hospital	Harrow Middlesex HA1 3UJ
King's College Hospital	London SE5 9RS
Bristol Genetics Laboratory, Southmead Hospital	Bristol BS10 5NB
Royal Liverpool University Hospital	Liverpool L7 8XP
Norfolk and Norwich University Hospital	Norwich NR4 7UY
Nottingham University Hospital NHS Trust	Nottingham NG7 2UH
Queen Elizabeth Hospital Birmingham	Birmingham B15 2WB
Institute of Neurology	London WC1N 3BG
Rotherham NHS Foundation Trust	Rotherham S60 2UD
Royal Brompton Hospital	London SW3 6NP
Royal Devon & Exeter NHS Foundation Trust	Exeter EX2 5DW
Royal Free and University Medical School	London NW3 2PF
Royal Surrey County Hospital	Guildford, Surrey GU2 7XX
Royal Sussex County Hospital	Brighton BN2 5BE
Royal Victoria Infirmary	Newcastle upon Tyne, Tyne and Wear NE1 4LP
St Helier's Hospital	Surrey, SM51AA
Sheffield Children's NHS Foundation Trust	Sheffield S10 2TH
St. George's University of London	London SW17 0NH
St Thomas' Hospital	London SE1 7EH
University College London Hospital	London W1T 4EU
Freeman Hospital	Newcastle Upon Tyne, NE7 7DN
Leicester Royal Infirmary	Leicester, LE1 5WW
University College London Hospital	London W1T 4EU
St Thomas' Hospital	London SE1 7EH
Llandough Hospital	Penarth, CF64 2XX
Bart's Health NHS Trust	London, E1 2ES
North Middlesex University Hospital	London, N18 1QX

Blood Gas Analysis:

This service is not available from the laboratory at St Mary's. There are a number of blood gas analysers across the Trust. Following training and issue of a password, users must take the sample using the specialist heparinised blood gas sampling devices.

The Standard Operating Procedure (SOP) for the safe use of the blood gas analyser POCT-LP-014-IMP is available on the "Point of Care Testing" page of the Trust Intranet and can be accessed via this link http://source/prdcont/groups/intranet/@clinical/@poct/documents/doc/id_023603.pdf

Hard copies of the SOP are also available in the Red POCT folder by the Nursing stations in designated clinical areas (locations below):

Blood Gas Analyser locations

	Trust Site	Ward/Department
1	St Marys	ITU North
2	St Marys	ITU South
3	St Marys	Manvers
4	St Marys	Major Trauma ward
5	St Marys	PICU
6	St Marys	Theatres
7	St Marys	A&E
8	St Marys	A&E Spare
9	St Marys	Lindo Maternity
10	St Marys	Winnicott Baby Unit
11	St Marys	Labour ward
12	St Marys	Chest and Allergy
13	Western Eye	Theatres
14	Hammersmith	Acute Dialysis Unit
15	Hammersmith	Specialist Medical Assessment Unit (SMAC)
16	Hammersmith	High Dependency, NNU
17	Hammersmith	Low Dependency, NNU
18	Hammersmith	GICU 1 & 2
19	Hammersmith	Lung Function
20	Hammersmith	Maternity 1 & 2
21	Hammersmith	De Wardener
22	Hammersmith	Theatre
23	Hammersmith	CICU 1 & 2
24	Hammersmith	Catheter Lab
25	Hammersmith	Edith Dare
26	Hammersmith	Chemistry Lab
27	Charing Cross	A&E
28	Charing Cross	Coronary Care Unit (CCU)
29	Charing Cross	ITU1
30	Charing Cross	ITU2
31	Charing Cross	HDU1 (11W)
32	Charing Cross	Theatre
33	Charing Cross	Riverside Theatre
34	Charing Cross	Main Laboratory
40	Charing Cross	Spare (in Biochemistry lab)

The Diagnostic Andrology (seminology) Service

Opening hours
The service is a walk in service from 09:00 – 13:00 each week-day (Excluding bank and NHS holidays).

Other services
The Andrology laboratory provides a sperm freezing service for patients undergoing treatments that may impair fertility particularly due to chemotherapy, radiotherapy and some surgery. Appropriate hospital consultants usually arrange these services, however occasionally general practitioners may be involved.

Contact Telephone
Lab. 020 3313 4680
Fax. 020 3313 3591
Sec. 020 3313 1039

Results are sent out by post or fax however it must be realised that any advice / interpretation is dependent on the clinical information provided. Please see reference values. The most important additional information for most interpretations is the length of time couples have been trying to conceive and the age of the female partner.

Advice for producing samples
As samples for fertility investigation should be analysed within 1 hour of collection it is recommended that patients attend the Laboratory to use the facilities provided.
Samples must only be collected into toxicity tested sample pots issued by the Laboratory. Samples collected into any other container will be rejected. Toxicity tested containers can be collected from the Laboratory. GPs can order the containers by contacting the Laboratory directly. GPs receiving supplies from ICHNT can order the containers using the GP supply order form.
If the sample is collected at home it must be brought to the laboratory as soon as possible. The date and time of collection must be clearly written on the sample pot & the test request completed.
If samples are not analysed within 60 minutes some tests will be invalid and will not be reported.

NB: The sample should not be exposed to extremes of temperature since both cold and heat can seriously damage sperm. Room to body temperature (25-37^{o}C) is best.

Post-vasectomy samples

The Andrology service follows the guidelines published in 2016 by the Association of Biomedical Andrologists, British Andrology Society & British Association of Urological Surgeons which state that: "Post vasectomy semen analysis should take place a minimum of 12 weeks after surgery and after a minimum of 20 ejaculations. Samples should also be assessed within 4 hours of production and if non-motile sperm are observed, further samples must be examined within 1 h of production. Assessment of a single sample is acceptable to confirm vasectomy success if all recommendations and laboratory methodology are met and no sperm are observed. Clearance can then be given."

As a consequence the Laboratory does not accept any Post vasectomy sample collected off site.

Semen diagnostic reference values are available on the Pathology website .

HAEMATOLOGY& BLOOD TRANSFUSION,
BLOOD SCIENCES DEPARTMENT

LOCATIONS

At St Mary's Hospital, the Haematology and Blood Transfusion laboratories are located on the 2nd floor of the Mint Wing at St Mary's Hospital.

At Charing Cross Hospital, the Haematology and Blood Transfusion laboratories are located on the 1st floor of the Laboratory Block.

At Hammersmith Hospital, the Haematology and Blood Transfusion laboratories are located on the ground floor of G Block.

At Chelsea and Westminster Hospital, the Haematology and Blood Transfusion laboratories are located on the 2nd floor by lift block D.

DESCRIPTION OF SERVICE

A full routine diagnostic service and out-of-hours emergency service is provided from the Haematology laboratory at all 4 hospitals, including full blood count, clotting factors and blood transfusion.

KEY PERSONNEL/CONTACT NUMBERS

North West London Pathology Haematology Clinical Leads - Dr Abdul Shlebak & Prof. Mike Laffan

	TEL.NO.	BLEEP
St Mary's Hospital		
ENQUIRIES	26540	
RESULTS ENQUIRIES	35353 (9am –5pm)	
URGENT REQUESTS	26540	
MAIN LAB	21130	
COAGULATION	26132	
BLOOD TRANSFUSION	21157	
MICROSCOPY	21059	
SPECIAL HAEMATOLOGY	21084	
Charing Cross Hospital		
ENQUIRIES	30520	
RESULTS ENQUIRIES	35353 (9am –5pm)	
URGENT REQUESTS	17158	
MAIN LAB	30520	
COAGULATION	17158	
BLOOD TRANSFUSION	17112	
MICROSCOPY	30547	
Hammersmith Hospital	**TEL.NO.**	**BLEEP**
RESULTS ENQUIRIES	35353 (9am – 5pm)	
URGENT REQUESTS	32454	
MAIN LAB	32454	
COAGULATION	32449	
BLOOD TRANSFUSION	34772	
SPECIAL HAEMATOLOGY	32448	

Clinical advice and Interpretation (CXH, HH and SMH)
During routine hours (09.00-17.00h, Monday to Friday) call hospital switchboard and ask the operator to bleep the Haematology Registrar as outlined dependent on the query (See below)

Speciality	**Bleep**
Coagulation	9072
General Haematology	9071
Blood Transfusion	9070
Haematological Malignancy	9077/9068

A consultant or specialist registrar is always available to give advice. The medical staff can be contacted by bleep if not in the laboratory. Out of hours the medical staff can be contacted via the SPR mobile phone and the Consultant mobile phone (number available through switchboard).

Chelsea and Westminster Hospital	**TEL.NO.**
RESULTS ENQUIRIES	35353 (9am – 5pm)
URGENT REQUESTS	55206
MAIN LAB	55206
COAGULATION	55206
BLOOD TRANSFUSION	58207

Clinical advice and interpretation (CWH)
In the first instance external callers should bleep the Haematology SPR via switchboard and ask them to bleep number **0902**. Failing that contact the Haematology Secretary on 020 331 58211 who will take a message.
Outside routine hours (17.30 – 09.00h, weekends and Bank Holidays) callers should call switchboard on 020 331 26666 (or dial "0" if calling internally) and ask the operator to page the Haematology Registrar on call for Chelsea & Westminster Hospital.

CONSULTANTS	**TEL.NO.**	**BLEEP**
Dr Laffan	32178/31320	5134
Dr Matthey (Chelsea and Westminster)	58211	
Dr Shlebak	21179	Air call: 4622083
Dr Marks	27908	1692
Dr Layton	22391/32173/31320	4080
Prof Apperley	33237/34017	
Dr Cooper	35182	
Dr Chowdhury	22391	
Dr Dazzi	32134/31709/34017	5094
Dr Kanfer	31407/35030	5981
Dr Karadimitris	38438/38117	
Dr MacDonald	35100/38117	
Dr Marin	31627/35038	
Dr Millar	32153/31320	
Dr Milojkovic	35101/34017	
Dr Pavlu (Locum Consultant)	38172	
Dr Rahemtulla	33236/34017	
Dr Regan (Blood Transfusion)	33234/31320	07659593374
Dr Rezvani	32175/34017	07958772262
Dr Salooja	35151	
Medical Secretary (St Mary's)	26806	

		TEL.NO.	BLEEP
Divisional Manager, Blood Sciences			
Ms Charlotte Mustoe		35909	
C.Mustoe@nhs.net			
QUALITY & GOVERNANCE MANAGER–			
Superna Sohal		15174	
LABORATORY MANAGEMENT			
St Mary's			
Ms Lorry Phelan	Site Manager	21687	
Mr Dan Pelling	Haematology & Coagulation	21084	
Mr David Johnson	Blood Transfusion	22203	
Anticoagulant nurses		26033	Bleep 1239
Hammersmith			
Mr Andrew Osei-Bimpong	Site Manager	33293	
Ms Lynn Robertson	Special & Routine Haematology	32448	
Mr Kurtis Lee	Special & Routine Coagulation	32449	
Ms Linda Chapple	Blood Transfusion	34774	
Charing Cross			
Mr Mike Lyall	Site Manager	17128	
Ms Jennie Davies	Haematology & Coagulation	17116	
Mr Lloyd Noble	Blood Transfusion	17116	
Chelsea and Westminster			
Ms Linda Wildridge	Site Manager	58094	
Mr Richard McLean	Haematology & Coagulation	58213	
Ms Louise Meaney	Blood Transfusion	55155	

Imperial Transfusion Practitioners	**Bleep**
Ms Denise McKeown	5626/2033/9237
Ms Sapna Sharma	5626/2033/9237

Chelsea & Westminster Transfusion Practitioner	
Ms Jan Gordon	0193
Ms Eve Wilson	0193

Site	**Bleep**
Chelsea and Westminster Out of hours BMS	0360
Hammersmith Out of hours BMS	Haem 9079/ BT 9122
Charing Cross Out of hours BMS	8160
St Mary's Out of hours BMS	1611

LABORATORY HOURS

Monday to Friday - Routine service (9.00-17.30h)
Specimens must be received by 11.00h for a report to be issued the same day.
Saturday & Sunday – 9.00am – 1300h(SMH) core tests only. Specimens must be received by 11am.
Saturday& Sunday –9.00-17.30h (HH, CW and CXH) restricted routine service.
Out of hours - Urgent work only

USE OF LABORATORY

When OCS is not available, follow the downtime procedures.

Always use the Order Communications System to order tests when available. Always fill in **all** areas of request. Clinical details are essential and requests for malaria **must** have full details on areas of travel and any prophylaxis taken. Patients on anticoagulation must have the type of anticoagulation entered in the clinical details section of the request form.

Please generate a separate OCS request for each of the following 3 groups of tests:
FBC, ESR, EPS, IMST, RETICS, MALARIA PARASITE, FILM, B12 + Folate - any combination of these tests can be included in one order.
NB:Please not that when ordering haematology tests via Cerner at CX, HH and SMH no request form is generated. At C&W Lastword forms are produced automatically when requests are made. Blood Transfusion requests always generate a request form regardless of what site or OCS is used.

SPECIAL COAGULATION TESTS -

- All ADULT special coagulation tests (except APAS and Anti-Xa) must be approved by the Haematology Registrar.
- All PAEDIATRIC special coagulation must be approved by the Paediatric Haematology registrar. Note at CWH there is no Paediatric Haematology registrar to provide approval so contact the Haematology Registrar for approval.
- All urgent requests must be discussed with the coagulation laboratory.
- Requests for Thrombophilia Screen, Antiphospholipid antibody Screen should be delivered to the laboratory as quickly as is possible as ideally they should be spun and frozen for storage before testing within an hour of being taken.
- Samples for platelet function assays should be taken to the laboratory as quickly as is possible due to the extremely short life of these samples.
- All the above tests/screens should not be transported to the laboratory in the pneumatic tube system

URGENT AND OUT OF HOURS REQUESTS -

Where a result is required urgently during routine hours, telephone the laboratory when sending the specimen. Remember it is your responsibility to ensure the specimen arrives in the laboratory. Requests for Factor Assays and monitoring of Low Molecular Weight Heparin (LMWH) must be approved by the out of hours Haematology registrar who will inform the laboratory of the request if approved.

Out of hours requests must be preceded by bleeping the duty BMS (numbers for different sites above) to arrange the test. These tests are expensive and must be restricted to those important for immediate management of the patient. The duty BMS is likely to be very busy and must not be slowed down by unnecessary requests and calls. If the need for a test is unclear the duty consultant will be contacted. Results will be available on the computer.

TESTS AVAILABLE OUT OF HOURS -

The following emergency investigations from Accident and Emergency and ITU before midnight do not have to be bleeped. All other departments must bleep to explain reason for urgency:

- Full blood counts.
- Clotting Screens.
- INRs, APTTR (For anti-coagulation monitoring)

Results will be available within an hour.
Note:This turnaround time cannot be guaranteed, as it is dependent on what emergency work is being performed in transfusion.

The following tests must be bleeped from all departments at all times (incl. A&E, RAU and ITU):

- D-Dimer (for PE & DVT) not available for inpatients– inpatients only available for DIC (clinical details must state query PE/DVT). Note: At CWH D-Dimer requests are accepted from all areas.
- Malaria screens.
- All transfusion requests.
- Sickle Screens (only done if patient is going to theatre)
- HbS % will be done if urgent and by prior arrangement.

Note: results will not be telephoned they will be available on the OCS.
At CWH 'Lastword' the OCS system can be used for viewing results.

LABELLING OF SPECIMENS

The laboratory will not perform tests on inadequately identified samples.
(See Blood Transfusion section for their labelling policy).

Please see below for the departmental test repertoire.

REPERTOIRE, REFERENCE RANGES AND TURNAROUND TIMES

TEST	CONTAINER	VOLUME	Turnaround Time	COMMENT	Add on time limit
Full Blood Count	**EDTA (purple)**	**4ml**	**Routine 4 hours ========= Urgent 1 hour**	**4ml FBC includes an automated differential. A manual film will only be done if requested or indicated.**	**<24 hrs.**
Sickle screen	**EDTA (purple)**	**4ml**	**Routine 24 hours ========= Urgent 1 hour**	**Can be performed on the same sample as FBC. URGENT pre-op only.**	**5 days**
Monospot	**EDTA (purple)**	**4ml**	**Routine 24 hours ========= Urgent N/A**	**Can be performed on the same sample as FBC.**	**2 days (whole blood)**
Reticulocytes	**EDTA (purple)**	**4ml**	**Routine 4 hours ========= Urgent 1 hour**	**Can be performed on the same sample as FBC.**	**<24 hrs.**
Malaria parasites	**EDTA (purple)**	**4ml**	**3 hours**	**Can be performed on the same sample as FBC. Full clinical details, prophylaxis and area of travel are essential.**	**8 hrs. for films. 3 days for RDT**
Hb electrophoresis	**EDTA (purple)**	**4ml**	**Routine 24 hours (1 working day) ========= CWH & CXH Routine 2- 3 days ========= Urgent same day (lab must be informed of sample)**	**Can be performed on the same sample as FBC.Ethnic origin essential.**	**5 days**
HPLC Abnormal ANC patient's interim report	**-**	**-**	**3 working days**	**Ante-natal patients' guidelines**	**N/A**
Ham's Test	**NA. Contact department**				
ESR	**EDTA (purple)**	**4ml**	**Routine 4 hours**	**If sending for bothe FBC & ESR**	**Only CW & CX – 8hrs**

TEST	CONTAINER	VOLUME	Turnaround Time	COMMENT	Add on time limit
			========= Urgent 2 hours	ensure tube is filled correctly	
G6PD	EDTA (purple)	4ml	Routine <5 days ========= Urgent 4 hr.	Urgent requests for patients starting on rasburicase must be approved by Haematology Registrar out of hours	5 days
Haptoglobin	Plain tube (red)	5ml	Routine 7 days ========= Urgent N/A	N/A	24 hrs. (sample must be separated on receipt)
Urinary haemosiderin	Universal container	10ml	Routine 5 days ========= Urgent N/A	Early morning urine	N/A
Prothrombin time	Citrate (blue)	2.7or 4.5ml	Routine 4 hours ========= Urgent 1 hour	Underfilled/Overfilled bottles cannot be accepted as results are inaccurate.	4 hrs
INR (warfarin control)	Citrate (blue)	2.7 or 4.5ml	Routine 4 hours ========= Urgent 1 hour	Underfilled/Overfilled bottles cannot be accepted as results are inaccurate.	Can be added at any time as long as PT has been performed
APTT APTTR	Citrate (blue)	2.7 or 4.5ml	Routine 4 hours ========= Urgent 1 hour	Underfilled/Overfilled bottles cannot be accepted, as results are inaccurate.	4 hrs. for APTT (for APTTR see INR above)
Thrombin time	Citrate (blue)	2.7 or 4.5ml	Routine 4 hours ========= Urgent 1 hour	Underfilled/Overfilled bottles cannot be accepted, as results are inaccurate.	4 hrs
Coagulation screen: (PT, APTT, Fibrinogen)	Citrate (blue)	2.7 or 4.5ml	Routine 4 hours ========= Urgent 1 hour	Underfilled/Overfilled bottles cannot be accepted, as results are inaccurate.	4 hrs.
D-Dimer	Citrate (blue)	2.7 or 4.5ml	Routine 4 hours	Underfilled/Overfilled bottles cannot	4 hrs.

TEST	CONTAINER	VOLUME	Turnaround Time	COMMENT	Add on time limit
			========= Urgent 1 hour	be accepted as results are inaccurate.	
Antiphospholipid antibodies screen	These investigations require special collection procedures, contact laboratory for details NB at CWH 3 x 4.5 ml Citrate (blue) required				4 hrs. post draw (1 month if frozen)
DRVVT (DRVVT is part of lupus screen)	Citrate	See comment	14 days	Refer to laboratory for sample bottle & volume	4 hrs. post draw (1 month if frozen)
Thrombophilia	These investigations require special collection procedures, contact laboratory for details NB at CWH 4 x 4.5 ml Citrate (blue) and 1 x 4.0 ml EDTA required				4 hrs. post draw (1 month if frozen)
Activated Protein C	Citrate	4.5 ml	14 days	Must be approved by Haematology Registrar	4 hrs. post draw (1 month if frozen)
Antithrombin	Citrate	4.5 ml	14 days	Must be approved by Haematology Registrar	4 hrs. post draw (1 month if frozen)
Protein C Activity	Citrate	4.5 ml	14 days	Must be approved by Haematology Registrar	4 hrs. post draw (1 month if frozen)
Protein S Free	Citrate	4.5 ml	14 days	Must be approved by Haematology Registrar	4 hrs. post draw (1 month if frozen)
Prothrombin gene mutation	EDTA	4 ml	28 days	Must be approved by Haematology Registrar	Indefinitely but routine samples may only be stored for 5days
Factor V Leiden	EDTA	4 ml	28 days	Must be approved by Haematology Registrar	Indefinitely but routine samples may only be stored for 5days
Bleeding disorders These investigations require special collection procedures, contact laboratory for details					
Single Assay Factor	Citrate	4.5 ml	14 days	Must be approved by Haematology Registrar	4 hrs. post draw (1 month if frozen)

TEST	CONTAINER	VOLUME	Turnaround Time	COMMENT	Add on time limit
vWF AG	Citrate	4.5 ml	14 days	Must be approved by Haematology Registrar	4 hrs. post draw (1 month if frozen)
Collagen Binding Assay	Citrate	4.5ml	14 days	Must be approved by Haematology Registrar	4 hrs. post draw (1 month if frozen)
Platelet Function Assay	Citrate	2.7ml or 4.5ml	4 hours	Must be approved by Haematology Registrar	N/A
Platelet Aggregation	Citrate	4.5ml or 2.7ml (6-8 samples)	4 hours	Must be approved by Haematology Registrar	N/A
Inhibitor Screen	Citrate	4.5 ml	14 days	Must be approved by Haematology Registrar	4 hrs. post draw (1 month if frozen)
Heparin induced thrombocytopenia	Citrate	4.5ml	Routine 4 hours	Must be approved by Haematology Registrar	2 hrs.
Heparin dose monitoring	Citrate	2.7ml or 4.5 ml	4 hours		4 hrs.
Test referred to external laboratories					
vWFMultimers	Contact laboratory for more information				
Platelet nuclotides	Contact laboratory for more information				
PAI & TPA	Contact laboratory for more information				
Factor 8 binding	Contact laboratory for more information				

Note: Malaria Rapid Diagnostic Tests used in the Haematology Departments are able to distinguish Plasmodium falciparum infections from non-falciparum infections. The test method is not intended to distinguish non-falciparum species from one another. Species identification is determined from blood film examination. Both of these analysis techniques have limits of sensitivity and as such where the sample is reported as negative, if the index of clinical suspicion of malaria remains high, it may be necessary to consider urgent re-testing especially if the patient has visited Southeast Asia and Plasmodium knowlesi infection is possible.

PLEASE REFER TO BLOOD TRANSFUSION SECTION					
TEST	**CONTAINER**	**VOLUME**	**Turnaround Time**	**COMMENT**	**Add on time limit**
Group & antibody screen	**EDTA (pink)**	**6ml 4ml for paediatric patients 1ml for > 4 months old**	**Routine 4 hours ========= Urgent 45mins**	**This is a different bottle to the FBC on no account willit be shared.**	**N/A**
Cross match	**EDTA (pink)**	**6ml 4ml for paediatric patients 1ml for > 4 months old**	**N/A – dependent on circumstances contact laboratory**	**A minimum of 24hrs preferably 48 hours is required for non-urgent transfusion. Must have 2 valid Group and Save samples for electronic issue.**	**Up to 72 hours from sample time provided no recent transfusion Contact the lab for clarity.**
Kleihauer	**EDTA (purple)**	**3 or 4ml**	**Routine 48 hours**		**Up to 7 days from sample time**
DAT	**EDTA (pink)**	**6 ml**	**Routine 24 hours**		**Up to 7 days from sample time**
Cold Agglutinins	**Special bottles**	**Please contact Individual laboratory for further advice**			

Note: If additional tests are required after the specimen has been sent, the laboratory must be contacted to ascertain if specimen is still viable.

REFERENCE RANGES FOR HAEMATOLOGY AUTOMATED FBC

Adults	MALES(n=100)	FEMALES(n=100)
WBC ($x10^9$/L)	4.2-10.6	4.2-11.2
RBC ($x10^{12}$/L)	4.23- 5.46	3.73-4.96
HB(g/L)	130-168	114-150
PCV (Ratio)	0.390-0.500	0.350-0.450
MCV (fl)	83.5-99.5	83.5-99.5
MCH (pg)	27.5-33.1	27.5-33.1
MCHC (g/L)	315-350	315-350
RDW	10.0-16.0	10.0-15.9
PLATELETS x(10^9/L)	130-370	135-400
NEUTS ($x10^9$/L)	2.0-7.1	2.0-7.1
LYMPHS ($x10^9$/L)	1.1-3.6	1.1-3.6
MONOs ($x10^9$/L)	0.3-0.9	0.3-0.9
EOSINs ($x10^9$/L)	0.0-0.5	0.0-0.5
BASOs ($x10^9$/L)	0.0-0.2	0.0-0.2
RETIC#	20.0-92.0	12.0-96.0

REFERENCE RANGES FOR HAEMATOLOGICAL VARIABLES IN CHILDREN

Red cell variables (all ethnic groups)

Age	RBC x 10^{12}/L	Hb g/L	HCT (Ratio)	MCV fl	MCH pg
0-1 day	4.00-5.50	130-200	0.420-0.600	97.0-115.0	31.0-39.0
1-7 days	3.90-5.40	130-190	0.360-0.600	95.0-112.0	31.0-37.0
7 days - 1 month	3.40-6.30	100-215	0.300-0.660	85.0-110.0	29.0-36.0
1 month -3 months	3.00-5.30	90-183	0.270-0.550	82.0-97.0	25.0-32.0
3 months – 6 months	3.30-5.00	95-135	0.270-0.400	70.0-88.0	23.0-30.0
6 months- 1 year	3.90-5.30	N/A	0.310-0.410	70.0-85.0	25.0-35.0
6 months- 6 years	N/A	105-135	N/A	N/A	N/A
1 – 2 years	4.10-5.30	N/A	0.330-0.410	71.0-84.0	23.0-31.0
2-6 years	4.2-5.00	N/A	0.340-0.400	73.0-86.0	24.0-30.0
2-12 years	N/A	N/A	N/A	N/A	N/A
6-12 years	3.1-5.1	111-147	0.320-0.430	75.0-89.5	25.6-30.9

White cells (babies, infants and children)

Age	WBC x 10^9/L	Neutrophils x 10^9/L	Lymphocytes x 10^9/L	Monocytes x 10^9/L	Eosinophils x 10^9/L	Basophils x 10^9/L
0-1 day	9.0-30.0	2.0-23.5	2.0-10.0	0.2-2.0	0.0-0.8	0.0-0.1
1-7 days	6.0-16.0	2.0-9.0	2.0-8.0	0.2-2.2	0.0-0.8	0.0-0.1
7 days - 1 month	6.0-18.4	1.2-9.0	2.0-9.0	0.2-2.0	0.0-0.8	0.0-0.1
1 month -3 months	6.0-19.5	1.2-9.0	2.0-9.0	0.2-2.0	0.0-0.6	0.0-0.1
3 months - 6months	6.0-16.0	0.7-4.7	1.5-10.5	0.2-2.0	0.0-0.4	0.0-0.1
6 months- 1 year	5.9-16.6	1.1-5.6	3.2-11.3	0.2-1.0	0.1-1.0	0.0-0.1
1-2 years	6.0-17.5	1.5-8.0	4.0-10.0	0.2-1.0	0.1-1.0	0.0-0.1
2-6 years	5.0-14.0	1.5-8.0	1.5-7.0	0.2-1.0	0.1-0.4	0.0-0.1
6-12 years	4.0-13.5	1.5-7.0	1.5-4.0	0.2-1.0	0.1-0.4	0.0-0.1

Platelets(babies, infants and children)

Age	Count x 10^9/L
0-1 day	150-350
1-7 days	150-450
7 days-1 month	150-500
1 - 3 month	150-550
3 months – 2 years	200-450
2-12 years	200-450

Note: Adult FBC reference ranges: established from Healthy donor blood A. Osei-Bimpong *et al*, Hammersmith Hospital (2008 - updated June 2013)
Paediatric FBC reference ranges: variable published data sources, ratified for Imperial College Healthcare NHS Trust by Professor Irene Roberts (Technidata project 2012).

Reference ranges for other Harmonised Haematology Tests

TEST	RANGE
G6PD (U/gHb)	6.3 – 11.2
Hb A_2 (%)	2.3-3.4
HbF (%)	0.2 – 1.2
ESR (mm/hr)	0-17 (male)
	1-23(female)

Note: G6PD reference ranges locally derived by evaluation of normal population across sites, L. Robertson et al, 2017
HbA_2 and HbF reference ranges: established from– BCSH Guidelines 2010 Blackwell Publishing Ltd, British Journal of Haematology, 149, 35–49 and confirmed using the Sickle cell and Thalassemia handbook for laboratories October 2012
ESR reference range locally derived by evaluation of normal population , L Robertson et al 2017

Harmonised Reference Ranges for Paediatric Coagulation for Ages up to 6 months		
Test	**Reference Range**	**Reportable Unit**
Prothrombin Time (PT)	10.0 - 12.7	Seconds
Activated Partial Thromboplastin Time (APTT)	21.0 - 33.0	Seconds
Fibrinogen	1.3 - 3.3	g/L
Thrombin Time	16.2 - 24.9	Seconds
Reptilase Time	19.7 - 25.0	Seconds
Factor 2 (II) Assay	0.60 - 1.09	IU/mL
Factor 5 (V) Assay	0.56 - 1.48	IU/mL
Factor 7 (VII) Assay	0.38 - 1.29	IU/mL
Factor 8 (VIII) Assay	0.67 - 1.41	IU/mL
Factor 9 (IX) Assay	0.44 - 0.78	IU/mL
Factor 10 (X) Assay	0.55 - 1.20	IU/mL
Factor 11 (XI) Assay	0.57 - 1.05	IU/mL
Factor 12 (XII) Assay	0.28 - 1.16	IU/mL
von Willebrand Factor Antigen Assay	0.63 - 2.23	IU/mL
Antithrombin Activity Assay	0.78 - 1.29	IU/mL
Protein C Activty Assay	0.43 - 1.02	IU/mL

Note: Due to the complexity of collecting blood samples for analysis on normal neonates and paediatric patients, the reference ranges for use on patients up to 6 months of age have been taken from published data, from a research study using comparable methodology and equipment as that currently employed in our organisation

Harmonised Reference Ranges for Coagulation for use in Patients Greater than 6 Months Age		
Test	**Reference Range**	**Reportable Unit**
Prothrombin Time (PT)	9.0 – 12.0	Seconds
International Normalized Ratio (INR)	Use Therapeutic Ranges	
Activated Partial Thromboplastin Time (APTT)	23.0 – 31.0	Seconds
Activated Partial Thromboplastin Time Ratio (APTR)	Use Therapeutic Ranges	
Fibrinogen	1.8 – 4.0	g/L
Thrombin Time	13.0 – 19.0	Seconds
D-Dimer	<560	Fibrin Equivelent Units (FEU)
Factor 2 (II) Assay	0.50 – 1.50	IU/mL
Factor 5 (V) Assay	0.50 – 1.50	IU/mL
Factor 7 (VII) Assay	0.50 – 1.50	IU/mL
Factor 8 (VIII) Assay	0.45 – 1.50	IU/mL
Factor 9 (IX) Assay	0.50 – 1.50	IU/mL
Factor 10 (X) Assay	0.70 – 1.50	IU/mL
Factor 11 (XI) Assay	0.70 – 1.50	IU/mL
Factor 12 (XII) Assay	0.50 – 1.50	IU/mL
Factor 13 (XIII) Assay	0.68 – 1.34	IU/mL
Heparin Assay (Anti Xa)	Use Therapeutic/Prophylactic Ranges	
Antithrombin Activity Assay	0.80 – 1.20	IU/mL
Antithrombin Antigen Assay	0.79 – 1.11	IU/mL
Protein C Activity Assay	0.70 – 1.40	IU/mL
Protein C Antigen Assay	0.70 – 1.40	IU/mL
Protein S Free Antigen Assay (Males)	0.70 – 1.20	IU/mL
Protein S Free Antigen Assay (Females)	0.50 – 1.10	IU/mL
von Willebrand Factor Antigen Assay	0.45 – 1.50	IU/mL
von Willebrand Factor Activity Assay (RICOF)	0.45 – 1.50	IU/mL
Collagen Binding Assay	0.45 – 1.50	IU/mL
Platelet Function Test - Collagen/Epinephrine	75 – 165	Seconds
Platelet Function Test - Collagen/ADP	60 – 120	Seconds
Plasminogen Assay	0.75 – 1.35	IU/mL
Alpha 2 Antiplasmin Assay	0.80 – 1.20	IU/mL
PAI Antigen Assay	11.0 – 69.0	ng/mL
tPA Antigen Assay	1.0 – 12.0	ng/mL
Fibrinogen Clot Weight	1.8 – 4.0	g/L

Note: The reference ranges for use on patients over the age of 6 months, including adults, has been locally derived through evaluation on representative normal individuals across the sites to reflect our patient population

REFERENCE RANGES FOR OTHER SMH HAEMATOLOGY TESTS

TEST	RANGE
KC4 – PT (secs)	10.5 – 165
KC4-APTT (secs)	27.3 – 46.7
KC4-TT (secs)	14.6 – 19.8
Acquired Inhibitors:	
DRVVT Ratio	0.96 – 1.20

Note: reference ranges locally derived by evaluation, K D Marriott *et al*, 2008.

REFERENCE LABORATORY DETAILS:

At times, it may be necessary to refer work to other laboratories or consultants. The department routinely sends work to the following organisations:

Reference Laboratory
Haemophilia Reference Centre St Thomas' Hospital, Lambeth Palace Rd, London, SE1 7EH
Haemophilia Reference Centre Royal Free Hospital, Pond Street, London, NW3 2QG
Red Cell Reference NHSBT Colindale, Charcot Road, Colindale, London NW9 5BG
H&I NHSBT Colindale, Charcot Road, London NW9 5BG
IBGRL NHSBT Bristol, 500 North Bristol Park, Northway, Filton, Bristol, BS34 7QH
Red Cell Reference NHSBT Bristol, 500 North Bristol Park, Northway, Filton, Bristol, BS34 7QH
H&I NHSBT Bristol, 500 North Bristol Park, Northway, Filton, Bristol, BS34 7QH
Haematology Great Ormond Street Hospital, Great Ormond St, London WC1N 3JH
Haematology, St Thomas' Hospital, Lambeth Palace Rd, London, SE1 7EH
National Haemoglobinopathy Reference Laboratory Molecular Haematology Level 4, John Radcliffe Hospital, Oxford 0X3 9DU.
Haematology- Central Middlesex Hospital Acton Lane, Park Royal NW10 7NS
Special Haematology- Kings College Hospital Denmark Hill, London SE5 9RS
The Royal Marsden Hospital, Section of Haemato-Oncology, Brookes Lawley Building Cotswold Road, Sutton Surrey SM2 5NG
N.W. Thames Regional Genetics Centre Northwick Park Hospital, Watford Road, Harrow, Middlesex, HA1 3UJ
The Bone Marrow Laboratory CameliaBotnar Laboratories Great Ormond Street Hospital, Great Ormond St, London WC1N 3JH
London School of Hygiene and Tropical Medicine Keppel Street,WC1E 7HT
Haematology Department, Special Section, 3rd Floor Accident and Emergency Building, University College Hospital, Grafton Way, London, WC1E 6DB (Globin Chain Biosynthesis)
Membrane Biochemistry, International Blood Group Reference Laboratory, NHS Blood and transplant North Bristol Park, Northway, Filton, Bristol, BS34 7QH (Red Cell Membrane Protein Analysis)
Purine Research Laboratories, Guy's Hospital, 5th Floor, Thomas Guy House, London Bridge, London, SE1 9RT.(Red Cell Nucleotide Profile (& P-5'-N)

Reference Laboratory
Department of Medicine, University College London, Rayne Building, University Street, London, WC1E 6JF (Intracellular Cation (& Flux) Studies)
Wessex Regional Genetics Laboratory – Salisbury District Hospital Odstock Road, Wiltshire, SP2 8BJ.

Please refer to UKAS website for details of accreditation

BLOOD TRANSFUSION

Requests for Blood Transfusion and Collection of Blood Samples for Pre-Transfusion Testing

Doctors should complete the transfusion request forms generated from OCS. If this task has been delegated then the person completing the form must put their identity on the form so that they can be contacted to discuss any issues if required.

The request form must contain full patient identification details i.e. surname, first name, date of birth and the hospital identification number. The request form must also give:

- The location of the patient at the time of request.
- Information about past obstetric and transfusion history including details of known red cell antibodies or previous transfusion reactions if applicable.
- The patient's diagnosis.
- The reason for the request.
- The name and contact bleep or phone number of the doctor making the request.

If a transfusion is requested the number and type of blood or blood components, including any special requirements and the time and date required must be included on the request form.
Note: Non – OCS request forms will be refused unless OCS is down

Emergency Transfusions

All emergency requests for blood and blood components must be discussed with the scientific staff in the Blood Transfusion Laboratory and, if necessary, the Haematology Specialist Registrar (see telephone requests section).

Bleeding patients should be managed by the patient's clinical team following assessment of patient. The Major Haemorrhage Protocol should be activated if required (algorithms on display in clinical areas and available in the blood transfusion guidelines).

Collection of Blood Samples

Staff that collect samples for pre-transfusion testing must have undergone appropriate training. The Blood Transfusion Laboratory is able to supply blood at short notice (approximately 10 minutes) by electronic crossmatch provided there are no clinically significant antibodies present. In order for the electronic crossmatch to be carried out it is mandatory that the Blood Transfusion Laboratory should have a minimum of two independently taken blood samples, which are grouped and screened for alloantibodies. It is desirable that the latter sample be submitted between 24 and 48 hours prior to the surgery. However, provided that the first sample has shown no alloantibodies, it would be permissible for the second sample to be submitted at the time of admission for the surgery.

Patient Identification

Positive identification of the patient is essential based on:

- Questioning the patient by asking their surname, first name and date of birth, in the case of patients who are judged capable of giving an accurate, reliable response. The information given should be checked to ensure it matches exactly that on the request form.
- On the ward, checking that the details on the patient's identification wristband match those on the request form and the answers to the questions above.

NB. If the wristband is removed, for example to insert a cannula, it is the responsibility of the person removing the wristband to replace it.

All patients receiving a blood transfusion MUST wear an identification wristband.

Sample Labelling

The sample tube must be labelled immediately after the blood has been added, by the person taking the sample:

- Sample tubes *must not* be pre-labelled.
- Addressograph labels *must not* be used for sample labelling.

For Blood transfusion all samples sent to NWL Pathology laboratories must have four identifiers- forename or unique alternative, surname or unique identifier, Date of Birth and Hospital number. In addition to the identifiers the sample must also be labelled with the sample collection date and initials or signature of collector if it is to be accepted by the laboratory.

In the situation of an unconscious patient, the patient should be registered as unknown male/female, DOB NK, and a request made via OCS.

Note: At St. Mary's trauma centre the patient will have an alias instead of "Unknown Female/male" comprised of a place name and phonetic alphabet character. DOB for unknown adult patients is 01.01.1900. DOB for unknown paediatric patients is today's date. Please refer to specific Trauma centre naming protocol.

Telephone Requests

Telephone requests for crossmatches *should* be made by the doctor involved. If in an emergency situation this is not possible this task can be delegated. The identity of the person making the request and the doctor who authorised them to do so will be recorded by the laboratory. The person to whom the task has been delegated must be able to provide the following required information.

1. Patient identification number, patient's surname and first name

2. Location

3. The number and type of blood and / or blood components required, including any special requirements

4. The reason for the request

5. The time and date the blood and / or blood components are required

Notice Required for Provision of Blood

Samples for elective surgery must be delivered to the Blood Transfusion Laboratory no later than 17.30pm on the day prior to surgery or 11.00on a Sunday for Monday morning lists. Between 17.30 and 9.00 on weekdays and on Saturday, Sunday and Bank Holiday afternoons, ONLY emergency work will be accepted.

If requesting blood at short notice, please contact the Blood Transfusion Laboratory directly on the extensions listed above or, if out of hours, bleep out of hours staff (numbers listed above).

PROTOCOL FOR COLLECTION OF BLOOD AND / OR BLOOD PRODUCTS FROM THE BLOOD ISSUE FRIDGE

The person collecting the blood and / or blood products (usually a porter, a nurse or a doctor) must be trained and familiar with this procedure. This is particularly important out of hours when the laboratory staff may not be available to help.

ADMINISTRATION OF BLOOD AND BLOOD COMPONENTS

Prescription of Blood and Components

The prescription of blood and blood components is the responsibility of *the doctor.* The prescription should be written on the "continuous or intermittent intravenous therapy" section of the drug chart and it is essential that this sheet should contain the patient identification details.

The prescription must specify:

- The blood or blood component to be administered, including any special requirements e.g. irradiated, CMV seronegative, Hep E negative.
- The quantity to be given, for paediatrics the rate and the volume in mls must be written
- The duration of the transfusion (usually 3 hours for red cell concentrate and 30 minutes for an adult pool of platelets or a unit of FFP)
- Any special instructions including any medication required before or during the transfusion e.g. diuretic cover.

NB. Blood transfusions must be treated like any other prescription. Patients (or relatives) should be informed of the indication for the transfusion, its risks and benefits. Signed consent is not required. An information leaflet is available from Blood Transfusion. It is strongly recommended that the indication for the transfusion is stated in the hospital notes. For patients undergoing invasive procedures the blood transfusion statement on the consent form must be highlighted.

THE CARE AND MONITORING OF TRANSFUSED PATIENTS

Patients receiving blood transfusions should be monitored for signs of the potential complications of transfusion and any suspected problems dealt with swiftly and efficiently.

Severe reactions are most likely to occur during the first 15 minutes of the start of each unit and patients should be most closely observed during the period.

- Only staff appropriately trained should be responsible for the care and monitoring of transfused patients
- Patients should be instructed to report any adverse effects such as shivering, rashes, flushing, shortness of breath and pain in the extremities or in the loins
- Transfusions should only be given in clinical areas where patients can be readily observed by members of the clinical staff and where resuscitation facilities are available
- The start and finish times of the infusion of each unit should be clearly indicated on the observation charts
- The guidelines for the Management of Transfusion Reactions can be found on the hospital Intranet.

ANTICOAGULANT CLINIC

Referrals to the anticoagulant clinic: (St Mary's Hospital ONLY)

An appointment will be made according to the degree of urgency when the referral form is received. Please ensure that it includes all the essential information. All patients will first be seen in St Mary's then depending upon their post code, they will be followed up in either St Mary's Hospital (Mon am or Thurs pm), St Charles Hospital (Tuesday all day), or Queens Park Clinic (Wed pm).

If the patient is to be referred to the Anticoagulant clinic, please take the following steps:

Complete the appropriate referral form for the anticoagulant clinic, completing all the required information (to avoid delay in allocating anticoagulant clinic appointment) and fax it to 23386, for the attention of the anticoagulant nurse specialist.

1. Make sure that an anticoagulant clinic appointment has been obtained prior to discharge (phone X 26033). If an appointment is not available, **it is your team's responsibility** to continue monitoring the INR until such an appointment is secured.
2. Before discharge, ensure the patient knows what the warfarin tablets are, and the dose he/she is taking.
3. Issue a yellow anticoagulant booklet in which you have written the last INR result, date and the Warfarin dose on discharge.
4. The Ward Pharmacist, as part of the normal daily ward Pharmacy visit, will check that the yellow anticoagulant booklet is completed and counsel the patient on points to remember when taking Warfarin.
5. Instruct the patient to bring the yellow anticoagulant booklet to the clinic.

THE MANAGEMENT OF PATIENTS NEWLY STARTED ON WARFARIN

Note: This procedure is not applicable to patients at Chelsea & Westminster Hospital. Separate guidelines for starting anticoagulation with warfarin are available on the Chelsea & Westminster intranet.

If the patient is on Heparin (UFH or LMWH) allow at least 3 days overlap and do not stop the heparin until warfarinisation is adequate.

1. **Day 1 of warfarin**: Prescribe 5mg

   Day 2 of warfarin: Prescribe 5mg

   Day 3 of warfarin: Request INR on a blood sample taken at 10am (together with APTT for UFH control). Prescribe the third dose of 5mg warfarin for 6pm

   Day 4 of warfarin: Request INR on a blood sample taken at 10am.
   Prescribe maintenance dose according to the following schedule:

INR	WARFARIN DOSE
<1.4	10.0mg
1.4	8.0mg
1.5	7.5mg
1.6 1.7	7.0mg
1.8	6.5mg
1.9	6.0mg
2.0 – 2.1	5.5mg
2.2 – 2.3	5.0mg
2.4 – 2.6	4.5mg
2.7 – 3.0	4.0mg
3.1 – 3.5	3.5mg
3.6 – 4.0	3.0mg
4.1 – 4.5	Miss out one dose then give 2mg
<4.5	Miss out 2 doses then give 1mg

Warn the patient not to take *aspirin* or *Ibuprofen*

PATHOLOGY POINT OF CARE TESTING SERVICE

DESCRIPTION OF SERVICE

Pathology Point of Care Testing (POCT) Specialty provides support for POCT services across Imperial College Healthcare NHS Trust and at Partnership Trusts (e.g. Chelsea and Westminster NHS Foundation Trust).

Pathology is mainly involved in the management and support for POCT services. The scope of Pathology POCT service provision includes (though not exclusively) advice on appropriateness of POCT, POCT device procurement, POCT device evaluation/verification, clinical advice, quality assurance, staff training, production of POCT policies and procedures in line with relevant standards, auditing and overall implementation of the POCT quality management system.

The Pathology POCT team works with clinical staff to ensure the POCT quality management system is implemented and embedded across all clinical areas. The POCT team provides regular reports to the relevant Trust's POCT Committee which is the POCT management group with overall responsibility for POCT.

KEY PERSONNEL/CONTACT NUMBERS

The POCT Specialty is consultant-led and the POCT Manager are responsible for the day-to-day management and ensuring safe delivery of the service. The POCT Manager is supported by five POCT Site/Department Leads.

Position	Name& Email	Tel No	Bleep
POCT Specialty Lead	Prof. Tricia Tan tricia.tan@nhs.net	02083838038/ 33380	-
POCT Manager	Mrs Olubunmi Martindale-Sheldon olubunmi.martindale-sheldon@nhs.net	020331(17081)	-
POCT Lead, St. Mary's (Blood Sciences)	Mr Gareth John gareth.john4@nhs.net	020331(21320)	1022
POCT Lead, Charing Cross (Blood Sciences)	Ms Kate Agunabor kate.agunabor@nhs.net	020331(17077)	5942
POCT Lead, Hammersmith (Blood Sciences)	Mr Wilbert Gwangwadza wilbert.gwangwadza@nhs.net	020331(32446)	9606
POCT Lead, Chelsea and Westminster (Blood Sciences)	Mr George Yartey gyartey@nhs.net	020331(55135)	0143
POCT Lead, Infection and Immunity	Mr Hitesh Mistry hitesh.mistry@imperial.nhs.uk	020331(10173)	-

ROUTINE SUPPORT

Routine hours – 09:00-17:30 Monday to Friday

Routine support for POCT services is coordinated by a team of POCT site Leads and a POCT Manager (See Key Contacts above).

OUT OF HOURS SUPPORT

Out of hours:
17:30 – 09:00 Monday-Friday
Saturday, Sunday and Bank Holidays

Limited support (via telephone) is provided out of hours via the Duty BMS in Biochemistry Laboratories across all sites. Contact details tabulated below:

Site	Tel No
St. Mary's Hospital	Duty BMS – 020331 (23752) or bleep 1022
Charing Cross Hospital	Duty BMS – 020331 (17004) or bleep 8161
Hammersmith Hospital	Duty BMS – 020331 (32113) or bleep 9022
Chelsea and Westminster Hospital	Duty BMS – 020331 (55133) or bleep 0143

GENERAL ENQUIRIES

All general enquiries regarding POCT should be directed to the relevant POCT site Leads (See Key Contacts above). Alternatively, please contact the POCT Manager.

CLINICAL ADVICE

Clinical advice for POCT is available from Prof. Tricia Tan, POCT Specialty Lead and Consultant in Metabolic Medicine and Endocrinology.

Clinical advice for Virology-related POCT devices is available from Dr David Muir, Consultant Virologist (ext. 10134).

ADDITIONAL INFORMATION

More information on POCT is available on the "Point of Care Testing" page of the Trust Intranet and in POCT equipment standard operating procedures (SOPs). Important information regarding procurement, training, operation, health and safety and quality assurance aspects of POCT devices including the key responsibilities of Pathology staff and Clinical users are detailed in the Trust POCT Policy which is also available on the intranet.

INFECTION & IMMUNITY SCIENCES – Immunology, Virology and Microbiology

LOCATION & DESCRIPTION OF SERVICES

Infection & Immunity Sciences at North West London Pathology consists of two Departments – Microbiology and Infection & Immunity, the latter consisting of the specialities of Clinical Immunology, Virology/Microbiology Serology and Histocompatibility & Immunogenetics (H&I).

Infection & Immunity Laboratory

The Department of Infection & Immunity is mainly based on the 9th floor Laboratory Block, Charing Cross Hospital where the Clinical Immunology, Virology and Microbiology Serology services are provided. The Histocompatibility and Immunogenetics (H&I) is located on the 1st and 2nd Floor of the G Block Laboratories at Hammersmith Hospital.

The Department provides a comprehensive, consultant led service for both Clinical Immunology and Virology. The Immunology service assists in the investigation, diagnosis and monitoring of patients with allergies, immunodeficiency and autoimmune diseases; the monitoring of patients about to and receiving immunosuppressive therapies. It also provides a wide range of Virology and Microbiology Serology diagnostic services including serological investigation and virus detection including molecular and antigen detection methods.
A comprehensive service for HLA typing, HLA crossmatching and HLA antibody screening is provided for renal and stem cell transplant patients and donors, as well as HLA disease association at the Hammersmith Laboratory.

Microbiology Laboratory

The Microbiology Service is provided from laboratories based on the 4th Floor Laboratory Block, Charing Cross Hospital while the Microbiology Serology service, while co-managed by Microbiology, is provided from the Department of Infection & Immunity as stated above.

The department provides a full range of diagnostic services including bacterial culture, parasite identification, mycological services and TB microbiology.

Clinical and Specialty Leads

The Clinical Lead for Infection and Immunity Sciences is Dr. Peter Kelleher who is also the specialty lead for Immunology. Dr. Hugo Donaldson is the specialty lead for Microbiology while Dr. David Muir is the specialty lead for Virology.

Additional Information

See the following individual specialty sections for additional information including contact details of key personnel within each department, the repertoire of tests and requirements and expected turnaround times.

INFECTION & IMMUNITY LABORATORIES: IMMUNOLOGY, VIROLOGY& MICROBIOLOGY SEROLOGY

LOCATION

The Infection & Immunity laboratory is mainly based on the 9th floor Laboratory Block, Charing Cross Hospital where the Clinical Immunology, Virology and Microbiology Serology services are provided. The Histocompatibility and Immunogenetics laboratory (H&I) is located on the 1st and 2nd Floor of the G Block Laboratories at Hammersmith Hospital.

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A comprehensive service for HLA typing, HLA crossmatching and HLA antibody screening is provided for renal and stem cell transplant patients and donors, as well as HLA disease association at the Hammersmith Laboratory

Clinical advice for Immunology is available from Dr Peter Kelleher, Clinical Senior Lecturer and Honorary Consultant Immunologist and from Dr David Muir for Virology. H&I Consultant advice is available from Dr Paul Brookes, Consultant Clinical Scientist.

For clinical advice on Microbiology Serology tests, please contact the site specific Microbiology consultants (See the Microbiology key personnel/contact numbers section.)

The main work streams of the department are: -
1. Histocompatibility and Immunogenetic (H&I) testing.
2. Autoimmunity and immunochemistry
3. Immunodeficiency and immune monitoring.
4. Viral Serology.
5. Microbiology Serology
6. Molecular Virology testing.

The Laboratory Service is accredited through the CPA and currently in transition to UKAS accreditation. The H&I laboratory is also accredited through the EFI. The laboratory participates in NEQAS and other external quality assurance schemes and it has a comprehensive internal quality assurance and control procedures.

The routine service laboratory is backed by active research programmes into allergy, HIV infection, immune deficiency, vaccine responses, immune function, cytokine regulation, and transplantation. HISS and the Immunology Requests display the range of common tests requested. Reports will quote age- and sex-related reference ranges where appropriate. Please note that it is necessary to pre-arrange certain highly specialised tests.

KEY PERSONNEL / CONTACT NUMBERS

NWL Pathology Clinical lead & Clinical Immunology Specialist lead is Dr Peter Kelleher. Virology Specialist Lead is Dr. David Muir. H&I Laboratory Director is Dr Paul Brookes, Consultant Clinical Scientist

Site	Contact	Name	Tel No.	Other
Cross Site	Operations Manager	Angela Jean-François (nee Hall)	17262 / 10133	via Switchboard
	Lead Clinician Infection & Immunity / Consultant Immunologist	Dr Peter Kelleher	10131 / 10149	
Charing Cross *(Clinical Immunology & Virology)*	**General Laboratory Enquiries**		**10130**	
	Consultant/ Virology Speciality Lead	Dr. David Muir	10134	via Switchboard
	Consultant Virologist	Dr. Paul Randell	10135	
	Specialist Scientist	Dr. Alison Cox	10141	
	Specialist Scientist	Jeremy Merritt	10163	
	Specialist Scientist	Graham Pickard (Acting)	10147	
	DepartmentalLead Scientist	Dr Panos Pantelidis	10136	
	Infection and Immunity Sciences Governance & Quality Manager	Emer Fahy	15175	
	Departmental Fax		10169	
Hammersmith *(H&I)*	H&I Consultant Clinical Scientist, Lab Director	Dr Paul Brookes	32146	
	H&I Principal Clinical Scientist	Ruhena Sergeant	38211	
	Specialist Scientist	Eva Santos	33226	

LABORATORY HOURS

Monday to Friday 9am to 5.30pm. There is no Saturday or emergency (on-call) service for Clinical Immunology at Charing Cross. See below for out of hour's service for Virology. The Hammersmith H&I laboratory provides a 24 hour on call service for the renal transplant programme and can be contacted through switchboard. The consultant for each speciality is available for advice on further investigation, interpretation of results and management. If not in the department the consultant can be contacted through switchboard.

TEST REQUESTING

Requests must be made using electronic ordering where available. The name and bleep number of the requesting doctor must also be completed. Ward Order Entry should ensure that these requirements are met. The inclusion of brief clinical details greatly assists with interpretation of results. Also, knowing if the Immunology tests are being used for diagnosis or monitoring of the patient helps.

Label the specimens carefully and completely – Unlabelled specimens will NOT be tested.

ADDITIONAL/ADD-ON TESTS

If additional Virology tests are required after the specimen has been sent, a Medical Virologist must be contacted on extensions 10138, 10139, 10134, 10135 or via switchboard. Samples are stored according to Royal College of Pathology guidelines and local policy and additional tests can only be added within these standard retention times. These are currently 6 weeks for plasma and serum (two years for antenatal booking blood and needle stick sera), 6 weeks for body fluids and aspirates and one month for swabs.
If additional Immunology tests are required, please note that all serum samples are retained for approximately one month. Further tests may be requested by contacting the laboratory.

If a sample has been sent as a serum save request, this will be retained for one year unless the laboratory is contacted by the requestor and informed otherwise.

TRANSPORT AND STORAGE

If samples cannot be transported to the laboratory the same day, they should be stored at +4°C to avoid deterioration EXCEPT for TB ELISPOT, quantiferon, lymphocyte subsets (LSS) and T cell subsets (TSS) T cell activation (TMARK) and primary immunodeficiency panel (TMEM and BMEM) and Neutrophil/Lymphocyte Function Tests, and complement genetics (CGENA) which should be send immediately to the laboratory and should not be stored at **+4°C.** Please see comments under specific Immunology test heading below and in the table of Virology tests repertoire for any additional requirements

URGENT REQUESTS AND RESULTS

Please contact Dr. Alison Cox (10130) at the centralised immunology laboratory to discuss requirements for urgent Immunology samples or for the H&I Hammersmith laboratory, Ruhena Sergeant (38211), Paul Brookes (33226), or Eva Santos-Nunez (33226).

If there is a clinical indication for urgent Virology testing, then it can be arranged via a medical virologist. Simply ring the medical virologist **AT THE TIME OF REQUESTING with a valid clinical indication for urgent testing,** so that an accurate availability and further arrangements can be discussed.

All urgent results will be telephoned to the wards. When requesting results by telephone please give your name and position, have the patient's unit number and date of birth available and indicate when the sample was taken. The requesting MO should clearly write their name and extension/bleep/pager number so they can be contacted easily when results are available, or if further information is required to select the most appropriate tests. When required, results can be faxed to a Safe Haven fax number.

ON-CALL / OUT OF HOURS SERVICE FOR VIROLOGY

Out of hours service for Virology is by special arrangement with the Consultant Virologist and is performed off site. Following agreement with the duty Consultant Virologist, certain on-call virology tests will be provided by the King's College Hospital Virology Department,

1. Discuss case with duty Consultant Virologist who will provide a contact number for the King's Virology Service.
2. Arrange for a courier to transport the sample to:

   South London Specialist Virology Centre
   Health Protection Agency London Regional Laboratory
   King's College Hospital NHS Foundation Trust
   2nd floor, Cheyne Wing
   Bessemer Road
   Denmark Hill, London SE5 9RS
   Tel: ++44 203 299 6155
   Fax: ++44 203 299 6477

The request should contain, relevant clinical information and ***a contact telephone and/or bleep number for the result***

CLINICAL ADVICE

Clinical advice for Immunology is available from Dr Peter Kelleher, Clinical Senior Lecturer and Honorary Consultant Immunologist. H&I Consultant advice is available from Dr Paul Brookes, Consultant Clinical Scientist and from Dr David Muir for Virology.

Get clinical help early by contacting a Medical Virologist, or by contacting the Infectious Diseases team. Advice is available on differential diagnosis, specimens required, and treatment and control of infection measures.

IMMUNOLOGY TEST INFORMATION

For specimen requirements see the pages below. Most serological tests can be performed on 5-10ml of clotted blood with gel separator, *which should be taken separately from samples for chemistry and protein tests*. Please call the laboratory for instructions on taking samples for lymphocyte and T cell subset analysis (usually taken into EDTA tubes), lymphocyte and neutrophil function tests (usually taken into heparin), and functional complement tests (need to avoid rapid decay of complement). *Some tests are only performed after consultation, may require special instructions and may need to be pre-booked into the laboratory to ensure personnel and reagents are available.* ***If in doubt – please ask***. Senior staff screen requests and lack of clinical information may result in delays or test requests being rejected.

St Mary's Site Specialist Immunology tests

All samples should be delivered to Clinical Biochemistry. The following labile tests will be forwarded on for processing to the Immunology section of the Department of Infection & Immunity, Charing Cross.

(1) Flow cytometry : T cells, T cell activation T/B/NK cells. PID panels
(2) Lymphocyte proliferation
(3) Neutrophil function tests
(4) C1 inhibitor tests
(5) CH50 and AP50.
(6) T-Spot-T (IGRA) assay
(7) Quantiferon (IGRA) assay

Arrangements for the delivery of Immunology specimens to the laboratory are as follows:

Lymphocyte subset analysis

- Samples must be sent to Specimen Reception at Clinical Chemistry for onward transport to Charing Cross.
- Samples cannot be processed if received after 13.00 on Fridays to be transported to the processing lab.
- Samples should be sent immediately to the laboratory and be kept at room temperature until transportation.
-

TB ELISPOT

- Tests are run Monday to Friday but those taken on **Fridays *must*** be received in Specimen Reception at Clinical Chemistry on non-Charing Cross sites before 12:15 to ensure transportation to the Immunology lab at Charing Cross by 14.00. This is a two day assay that needs to be performed on freshly taken blood samples; hence Friday samples cannot be processed if received after 14.00 in Immunology.
- Samples should be sent immediately to the laboratory and be kept at room temperature until transportation.
- Samples must be received in Immunology at Charing Cross within 24 hrs. of venesection.

Quantiferon

- For Quantiferon test, please take 2 x lithium heparin samples.
- Samples must be received in the Infection & Immunity lab at Charing Cross by 16.30 on Monday to Friday.
- Ensure enough time for transportation, see local transport times.
- Samples should be sent immediately to the laboratory and be kept at room temperature until transportation.

Cellular function assays

- These must be agreed with consultant immunologist
- They need to be pre-booked into the laboratory so that personnel and reagents are available to process
- Samples must be received in the lab by 13.30 on days agreed with the laboratory.
- Please telephone extension 10130to arrange these tests

Routine immunology samples

- All other samples for immunology should be sent to clinical chemistry at SMH where they will be couriered to the centralised immunology laboratory

Other Imperial Sites (Hammersmith, Charing Cross)

Samples should be delivered to the shared Specimen Reception areas(Client Service Units)

Lymphocyte subset analysis

- Samples cannot be processed if received in Client Service Units after 13.00 on Fridays
- Samples must be received in Immunology on day of venesection
- Samples should be sent immediately to the laboratory and be kept at room temperature until transportation.

TB ELISPOT

- Tests are run Monday to Friday but those taken on **Fridays *must*** be received in Specimen Reception at Clinical Chemistry on non-Charing Cross sites before 12:15 to ensure transportation to the Immunology lab at Charing Cross by 14.00. This is a two day assay that needs to be performed on freshly taken blood samples; hence Friday samples cannot be processed if received after 14.00 in Immunology.
- Please ensure enough time for samples to be couriered to the centralised Immunology laboratory.
- Samples must be received in Immunology at Charing Cross within 24 hrs. of venesection.
- Samples should be sent immediately to the laboratory and be kept at room temperature until transportation.
- Contact Immunology on extension 10130if blood tubes are required

Quantiferon

- Samples must be received in Infection & Immunity laboratory at Charing Cross by 16:30 on Monday to Friday.
- Please ensure enough time for samples to be couriered to the centralised Infection & Immunity laboratory.

- Samples should be sent immediately to the laboratory and be kept at room temperature until transportation.
- Samples must be received in Infection & Immunity on day of venesection.

Cellular function assays

- These must be agreed with consultant immunologist
- They need to be pre-booked into the laboratory so that personnel and reagents are available to process
- Samples must be received in Immunology on days agreed with the laboratory.
- Please telephone extension 10130to arrange these tests

Routine immunology samples

- All other samples for immunology should be sent to the client service units on each site where they will be couriered to the centralised immunology laboratory

INTERPRETATION OF RESULTS

The consultants and senior laboratory staff are available to answer queries and assist in the interpretation of results. If you are unsure of the most suitable tests to be performed, please discuss BEFORE taking the sample.

Immunodeficiency

Diagnosis of immunodeficiency requires a low clinical threshold and specialist investigations. Basic first line tests include FBC (neutrophil and total lymphocyte counts) and serum immunoglobulins (IgG, IgA and IgM). In an adult with recurrent infections and low immunoglobulins, perform a serum electrophoresis to rule out secondary causes for hypogammaglobulinaemia such as myeloma.

In patients with recurrent infections, the nature of the organism can hold clues about the nature of the underlying defect. In cases where opportunistic infections such as pneumocystis, non-tuberculous mycobacteria or disseminated viral or fungal infections are present, a cellular immunodeficiency should be suspected. Secondary causes such as HIV and medications should always be ruled out before considering a primary immunodeficiency. Monitoring T cell subsets in HIV positive patients is performed in immunology. In cases where the patient is HIV negative, please discuss with the immunology lab and perform T, B and NK subsets (not T cell subsets).

A child under 2 years of age with a low T cell count should be considered to have a severe combined immunodeficiency until proven otherwise. For these cases only CMV negative irradiated blood products should be given and all live vaccines should be avoided. Further specialist tests on these cases should be discussed with the immunology consultant Dr Peter Kelleher 58246.
In cases where there are encapsulated organisms such as Haemophilusinfluenzae (HIB), Neisseria meningitides or Streptococcus pneumoniae causing infection, both serum immunoglobulins, functional antibodies (to tetanus and HIB) and CH50/AP50 (classical and alternative complement pathways) should be tested. In addition, patients who do not respond appropriately to anti-microbial agents may need further investigation. Other presentations such as hepatic abscesses or deep-seated staphylococcal or fungal infection should be tested for neutrophil function after discussion with the immunology consultant Dr. Peter Kelleher x58246

Functional antibodies (such as anti-Hib and anti-tetanus) antibodies give information about the response to immunisation. If low the patient should be immunised and the post-immunisation levels checked after a minimum of four weeks.

Angioedema

Some patients develop angioedema without urticaria. In these cases where medications have been excluded as a cause, another possible underlying cause is C1 inhibitor deficiency, which may be inherited (called hereditary angioedema or HAE) or acquired (usually secondary to lymphoproliferative conditions or autoimmunity). A good screening test is to check the C4 level, which will be low. In cases where the C4 is low, C1 inhibitor deficiency should be ruled out. For this, please telephone the laboratory (X58243) to arrange C1 inhibitor testing.

SUGGESTED PROFILESFOR IMMUNOLOGY - Immune Deficiency

HIV Infection Monitoring	**T cellsubsets (CD3 / CD4 / CD8)** *
Antibody Deficiency	**IgG, IgA and IgM [Chemical Pathology Test]** Serum protein electrophoresis [Chemical Pathology Test] Vaccine-specific antibodies (Tetanus, Hib, Pneumococcal)
Hereditary Angioedema (C1 inhibitor deficiency)	C3 and C4 **C1 inhibitor (antigenic and functional)** ** [only, if C4 low]
Other Complement Deficiencies (e.g. C1q, C2, C5-C9)	C3 and C4 **CH50** *** and **AP50** *** Individual complement proteins (e.g. C1q, C2, C5-9) can be measured if the CH50 and/or AP50 results are abnormal
Other Immunodeficiencies Direct Request	Investigations for possible defects of: : B cell memory/T cell memory, Antibodies, T cells, Phagocytes, Complement, IL12-IFN gamma pathway etc - Discuss with the Consultant Immunologist for the appropriate test selection for individual patients

***Samples can only be processed within 24 hours of collection.**

** Samples can only be processed within 8 **hours** of collection. If the C4 level is normal C1 inhibitor levels will not be tested unless discussed with consultant immunologist

*** **Samples can only be processed within 1 hour of collection.**

For the **tests in bold** font**, please ensure prompt delivery directly to the Immunology Laboratory.**

Connective tissue diseases

The immunology laboratory has a useful part to play in the diagnosis (and in some cases monitoring) of patients with connective tissue diseases. ANA (anti-nuclear antibodies) are classically positive in SLE, but can also be seen in other connective tissue diseases such as scleroderma, Sjogren's and mixed connective tissue diseases. The significance of the results of these tests however depends on the pre-test probability of a connective tissue disease being present and it is important to remember that a positive ANA alone does not give a diagnosis. In a healthy population up to 5% of adults have a positive ANA, and the incidence of such non-specific ANAs rises with age. ANA can be positive in infections, autoimmune liver disease and can become positive as a result of medications (e.g. anti-TNF therapy). If the patient has features of a connective tissue disease and has a positive ANA then further testing should be done. These include antibodies to ENAs (extractable nuclear antigens) and dsDNA (double-stranded DNA). High levels of dsDNA are seen in SLE (often accompanied by Lupus Anticoagulant and anti-cardiolipin antibodies).

Disease associations with the common ENAs are shown below

Ro (SS-A) and La (SS-B)	SLE, Sjogren's syndrome, congenital heart block or neonatal lupus
Sm	SLE
RNP	Mixed connective tissue diseases
Scl-70	Systemic sclerosis and pulmonary fibrosis
Jo-1	Polymyositis/dermatomyositis

Once a patient develops antibodies to ENAs, these are unlikely to change unless the patient has a major change in clinical features.

Organ-specific autoimmune hepatitis

For patients with suspected autoimmune hepatitis an LKS screening test should be performed. Positive sera will be reflex tested to classify the disease. For patient with B12 deficiency the GPC (gastric parietal cell) antibodies will be present in the majority, although GPC antibodies can be found in other autoimmune conditions. The more specific test is anti-IFA (Intrinsic Factor antibody), which can be found in 60% of patients with pernicious anaemia.
Anti-mitochondrial antibodies are seen in Primary Biliary Cirrhosis, and other liver antibodies such as smooth muscle and anti-LKM (liver kidney microsome) are seen in autoimmune hepatitis.

Rapidly progressive renal failure and vasculitis

In acute renal failure that may be secondary to vacuities, tests that should be performed are ANCA (anti-neutrophil cytoplasmic antibody) and anti-GBM (anti-glomerular basement membrane antibody). Other tests that should be considered include rheumatoid factor, C3, C4, ANA and cryoglobulins.

- Anti-GBM antibodies are positive in almost all cases of Goodpastures syndrome and anti-GBM disease.
- ANCA positive vasculitis can be either cANCA (with anti-PR3 antibodies) or pANCA (with antibodies to MPO). These positive results are associated with Wegener's granulomatosis (cANCA and PR3 positive) or small vessel vasculitis (pANCA and MPO).

It is important to contact the laboratory in cases where an underlying vasculitis is suspected, as this will enable the laboratory to prioritise these samples, thereby guaranteeing rapid results. Please note a negative ANCA cannot exclude an underlying vasculitis.
As with ANAs the usefulness of an ANCA result depends on a high pre-test probability of a vasculitis being present. ANCAs can be seen in infection and are very common in inflammatory bowel disease. In these non-vasculitic settings, the ANCA can be either apANCA (most commonly), pANCA or an atypical ANCA, and can be MPO or PR3 positive.

Coeliac Disease

Anti-tTG (anti-tissue transglutaminase) and anti-endomysial antibodies are the serological tests for coeliac disease and dermatititisherpetiformis. These antibodies are of the IgA isotype and therefore false negatives can occur in IgA deficiency (IgA <0.07 g/L). In IgA deficiency (1/700 of the population), a negative anti-tTG result is unhelpful and biopsy is recommended.

Thyroid Disease

Autoantibody testing in thyroid disease is used to predict those patients who will go on to develop overt thyroid disease. The detection of such antibodies in asymptomatic patients should therefore lead to a high index of suspicion for thyroid disease, and a low threshold for requesting thyroid function tests when the patient presents with symptoms. It may be worth screening the thyroid annually.

Autoimmune thyroid disease is strongly associated with pernicious anaemia and vice versa. More rarely, thyroid disease may be associated with Addison's disease in addition to pernicious anaemia.

SUGGESTED PROFILESIMMUNOLOGY - Autoimmune / Connective tissue Disorders

Rheumatoid Arthritis	Rheumatoid Factor CCP
Connective Tissue Diseases (SLE, Sjogrens, MCTD etc)	C3 and C4 Rheumatoid Factor Anti nuclear antibodies ds DNA antibodies ENA antibodies
Vasculitis	C3 and C4 Rheumatoid Factor Anti nuclear antibodies Anti neutrophil cytoplasmic antibodies
Liver Autoimmunity	Anti nuclear antibodies Mitochondrial antibodies Smooth muscle antibodies Liver-Kidney-Microsomal Antibodies
Renal Autoimmunity	C3 and C4 [Chemical Pathology test] Anti nuclear antibodies Anti neutrophil cytoplasmic antibodies Glomerular Basement Membrane antibodies C3 Nephritic factor where indicated
Coeliac disease	Tissuetransglutaminase (IgA) Total IgA
Thyroid disease	Thyroid peroxidase antibodies Thyroid hormone stimulating antibodies

Allergy tests

These tests should be used as an adjunct to skin prick tests. For IgE-mediated allergy a detailed history should be taken to guide the clinician as to which tests to request. In the case of peanut, egg white and cow's milk, specific IgE tests are useful, but for some allergens such as wheat, soya, fruits and drugs (e.g. penicillin), specific IgE tests are not very useful. Requests for multiple allergens and "rare" allergens are discouraged, as the tests are expensive and the results can be very difficult to interpret. False positive specific IgE results can occur in patients with very high total IgE levels (such as eczema patients with IgE>5000KUA/L). Therefore low positive specific IgE results in such patients should be interpreted with caution.

The most useful of these are:

Aeroallergens	House dust mite Grass Pollen (Timothy Grass) Mixed Trees (Box-elder, Silver Birch, Hazel, Oak, London Plane) Cat dander Dog dander Aspergillusfumigatus
Common foods	Peanuts (ground nuts) Fish (cod) Milk Egg Wheat
Insect Venom	Bee Wasp
Drugs	Penicillin G & V
Occupational	Latex

Anaphylactic/Anaphylactoid Reactions (including Anaesthetic Reactions)

Contact the Immunology Laboratory immediately. If outside laboratory hours, collect 5-10ml of Clotted blood with gel separator (gold topped tube) for serum tryptase level, the first within one hour of the reaction, and further samples at 3 and 24 hours after the reaction. Label each tube clearly with the *time taken***.** In addition, EDTA samples taken at the same time should be sent for routine haematology. Send full details of the agents used and relevant previous drug history, type of operation, symptoms and signs, management and outcome.

Interferon-Gamma Release Assays (IGRA).

These assays can be used to help determine if a person has a latent infection with Mycobacterium tuberculosis. Two assays are currently available, the Quantiferon test and T-Spot (TB Elispot) assay. Both of these assays have special sample requirements; please ring the laboratory to discuss prior to bleeding the patient.

H&I TEST INFORMATION

Tests performed at the Hammersmith Laboratory include:
HLA CLASS I TYPE (HLA1)
HLA CLASS II TYPE (HLA2)
HIGH RESOLUTION HLA CLASS I & II TYPING (as required)
HLA Antibody Identification (CABS/HLA ABS/lymphocytotoxic antibodies)
HLA B27 (HLAB27)
HLA B*57:01 (HLAB57)
HLA Crossmatching (HLAXM)
Urgent samples by prior arrangement with the lab.

HLA CLASS I TYPING

HLA1
20ml blood in EDTA (purple top).
HLA typing is carried out at low to medium resolution for HLA -A, -B and -C to antigen level, for renal and bone marrow patients and their respective donors, in addition to looking at disease association.

HLA CLASS II TYPING

HLA 2
20ml blood in EDTA (purple top)
HLA typing is carried out at low to medium resolution for HLA -DR, -DQ to antigen level, for renal and bone marrow patients and their respective donors, in addition to looking at disease association.

HIGH RESOLUTION HLA CLASS I and / or CLASS II TYPING

20ml blood in EDTA (purple top).

In unrelated donor bone marrow transplantation, HLA matching must be to the highest level possible. High Resolution typing for HLA -A, -B and -C (Class I) or HLA -DR, -DQ (and -DP) (for Class II) resolves specificities to the allelic level. In certain situations it may be appropriate to type for the presence or absence of one or more specific HLA alleles. In particular, the possession of certain alleles is known to predispose individuals to various conditions and autoimmune diseases. In these cases, where HLA typing is used prognostically, or as a tool to aid diagnosis, it is essential that the request includes information on the suspected condition(s). High resolution typing is normally performed after basic or low-resolution HLA typing, and the cost is therefore additional to the cost of basic typing. There is no test request code for high resolution typing; the test is performed based on clinical relevance or specific request as discussed with the laboratory.

LYMPHOCYTOTOXIC ANTIBODY (HLA antibodies)

CABS/HLA Abs/DSAbs
10ml clotted blood (red top)
Please provide HIV and hepatitis B status.

Used for the detection and characterisation of lymphocytotoxic antibodies in patients awaiting renal or pancreas transplant, or those who have received a transplant. Also used in the investigation of transfusion reactions. For renal/pancreas recipients, patient antibody profiles are maintained by the laboratory. Results are held with the patient history, and are not routinely reported for individual samples. The laboratory employs a number of alternative

assay systems with varying sensitivity and clinical significance. In most cases, routine screening will be performed using one, or a combination, of complement dependent cytotoxicity, ELISA, flow cytometry or Luminex technology. Post transplant monitoring is usually performed using Luminex Single Antigen (SA) analysis. a powerful technique used to detect the presence of donor-specific antibodies (DSA). It is important to record the sample date when requesting these tests.

HLA B*27
HLAB27
5-10ml blood into EDTA (Purple top).

Although HLA B27 is present in approximately 10% of the normal population, it if found in 88-96% of patients with ankylosing spondylitis (AS). It is also associated with other rheumatological disorders, including Reiter's syndrome and is a strong diagnostic indicator for AS. A positive result indicates the presence of this antigen.

HLA B*57:01
HLAB57
5-10ml blood in EDTA (Purple top).

HLA-B*57:01 Screening for Abacavir Hypersensitivity
Most patients can safely take abacavir; however, a small number of patients experience a severe side effect known as abacavir hypersensitivity. The most common symptoms are skin rash, fever, nausea, vomiting and diarrhea. About 5% of patients who take abacavir experience abacavir hypersensitivity. This reaction can sometimes be very serious and in some cases can cause death. Patients who are HLA-B*57:01 are much more likely to have this reaction than patients who do not. Therefore, patients with the HLA-B*57:01 gene should not take abacavir. Approximately 5-8% of Europeans, 1-2% of Asians, and 2% of Africans have this gene.

HLA CROSSMATCH
HLAXM
20ml EDTA blood (purple top) from donor
10ml clotted blood (red top) from recipient
BOTH samples must be <24 hrs old.

HLA Crossmatching tests recipients' serum for the presence of anti-donor antibodies which may represent a risk or contraindication to transplantation, particularly in solid organ grafts. Preformed IgG, or occasionally IgM antibodies, in the recipient, directed against donor HLA antigens, are a cause of hyperacute or accelerated allograft rejection. This is a two-part test, performed by complement de**pendent cytotoxicity (CDC) and flow cytometry.**

CDC detects IgG and IgM complement fixing antibodies that are likely to cause antibody-mediated rejection. FCXM does not rely on complement dependent cytotoxicity and can therefore detect non-complement fixing IgG1 and IgG3 antibodies as well. It is significantly more sensitive than the CDC crossmatch and is of particular benefit prior to transplantation of sensitised recipients or recipients of second or subsequent allografts. It is important in these tests to provide very clear clinical details, including the relationship of the potential donor to the recipient.

TEST REPERTOIRE, REFERENCE RANGES & TURNAROUND TIMES (Immunology, Virology, Microbiology Serology)

General Notes on Infection & Immunity tests requirements

1. For additional information on test background and clinical indications, please also refer to the test repertoire on the Pathology website on http://nwlpathology.nhs.uk/
2. For all written and printed requests, sample& form labelling must match for surname, forename, hospital/NHS number and date of birth where applicable. Forms must carry legible requesting doctor, consultant and location details.
3. Please supply relevant clinical details.
4. Please use the tube type specified below. Serology tests, unless specified otherwise, require a 5 ml Gel SST **Rust Top** tube. See the Pathology tube guide for further guidance.
5. If samples for Serology tests cannot be transported to the laboratory the same day, they should be stored at +4^{o}C to avoid deterioration. See specific tests for other test specific storage and transport requirements.
6. Turnaround times are given in working days and exclude weekends and bank holidays
7. Reference ranges do not normally apply to Virology and Microbiology serology tests on serum. Most are qualitative. Thus they are normally negative unless there has been previous infection or vaccination. Where they are quantitative, reference ranges will be given.
8. Findings for virus detection tests should be discussed with the Consultant Virologist or other Medical personnel.
9. Both swabs and viral transport media (VTM) used for virus detection MUST be in date; please check before use. Out of date samples may be rejected.
10. Please use and separate containers for samples requiring both Virology tests and Microbiology culture tests e.g. CSFs and Bronchoalveolar Lavage (BAL).
11. Please make sure ensure bags are sealed correctly to prevent either samples or forms from falling out and that tops of universal containers are tightened securely to prevent leakage.
12. All referred Microbiology serology requests are vetted by the Microbiologist and may not be referred if relevant clinical details are not supplied. Some requests may only be referred after discussion with the Microbiologist.
13. Virology and Immunology samples to be performed urgently must be discussed with the I&I laboratory (in the case of Virological investigations, with a Medical Virologist on ext. 10138 or 10139) and if eligibility for same day testing is agreed, these must be in the laboratory at Charing Cross by 12:00 for respiratory virus PCR testing and by 14:00 for viral serology tests and immunology tests such as LSS, ANCAS and TB Elispot.

Immunology Service Test Repertoire (see also General Notes on Infection & Immunity tests requirements in previous section)

Test	Sample type	Container	Ref Ranges	Turnaround time	Additional requirements and other comments
Acetylcholine receptor (ACR) antibodies	1 mL Serum	5ml GEL SST (Rust Top)	0-5 x 10^{-10}mol	28 days	Not currently performed in house; this test is referred to the Department of Immunology at the Churchill Hospital in Oxford.
Adrenal cortex antibodies	1 mL Serum	5ml GEL SST (Rust Top)	Negative	14 days	
Allergen Specific IgE (PhadiaImmunocap) (See also Total IgE)	Minimum 5ml.	5ml GEL SST (Rust/Yellow top)	Negative 0 - 0.34 kUA/L	14 days	• Please note additional tubes are required if more than 10 allergens are requested. • For component resolved diagnostics testing 1 mL per allergen is required. • Also referred to Sheffield Protein Reference Unit or Biomnis if the specific IgE request is not in our repertoire
Antinuclear antibody screen	1 mL Serum	5ml GEL SST (Rust Top)	Negative	4 days	
Anti - Neutrophil cytoplasmic antibodies (ANCA)	1 mL Serum	5ml GEL SST (Rust Top)	Negative	5 days	See Neutrophil cytoplasmic antibodies
Aquaporin Antibody	1 mL Serum (Can also be performed on CSF)	5ml GEL SST (Rust Top) (Sterile Universal if CSF)	Negative	28 days	Not currently performed in house; this test is referred to the Department of Immunology at the Churchill Hospital in Oxford.
Basal ganglia antibodies (ABGA)	1 mL Serum (Can also be performed on CSF)	5ml GEL SST (Rust Top) (Sterile Universal if CSF)	Negative	28 days	Not currently performed in house; this test is referred to the Institute of Neurology, Queens Square, London
Beta 2-glycoprotein 1 antibodies	1 mL Serum	5ml GEL SST (Rust Top)	Negative	7 days	Screening now includes IgG,IgM,IgA *Currently awaiting accreditation for this test*
Cardiac muscle antibodies	1 mL Serum	5ml GEL SST (Rust Top)	Negative	28 days	Not currently performed in house; this test is referred to the Protein Reference Unit, Sheffield

Test	Sample type	Container	Ref Ranges	Turnaround time	Additional requirements and other comments
Cardiolipin antibodies	1 mL Serum	5ml GEL SST (Rust Top)	Negative	7 days	
Centromere antibodies	1 mL Serum	5ml GEL SST (Rust Top)	Negative	4 days	
Coeliacantibodyscreen					See under Tissue transglutaminase antibodies
Complement C1 esterase inhibitor – antigenic	1 mL Serum	5ml GEL SST (Rust Top)	0.22-0.38g/L	21 days	Separate and freeze immediately Transport frozen
Complement C1 esterase inhibitor – functional	1 mL Serum	5ml GEL SST (Rust Top)	0.7-1.3 g/L	21 days	Separate and freeze immediately Transport frozen
C1Q antibodies	1 mL Serum	5ml GEL SST (Rust Top)	0-10 U/ml	21 days	Not routinely available. Please discuss with lab prior to taking sample.
Complement C3 and C4 components	1 mL Serum	5 mL SST **(Gold top)**	C3 : 0.7-1.7 g/L C4 : 0.16-0.54 g/L	4 days	
Complement C3 nephritic factor	1 mL Serum	5ml GEL SST (Rust Top)	Negative	28 days	**Separate and freeze immediately Transport frozen**
Complement genetics	Whole blood (Clearly labelled with surname, forename, hospital / NHS number and date of birth)	1 x 10 mL (or 2 x 6 mL) EDTA (lavender top)		90 days	Record the date the sample was taken on the request form. The sample should be sent in a secure container (at ambient temperature) by first class post (within UK) or by courier (outside UK). Due to the specific nature of these tests, they must be pre-arranged with a senior scientist (Dr P Pantelidis, Dr A Cox) from the Immunology laboratory, who will also supply you with a special request form. The request form can also be downloaded

					from this link. If there is uncertainty regarding the gene target(s), we recommend that you contact Prof. Matthew Pickering (Professor of Rheumatology, Centre for Complement & Inflammation Research (CCIR)) before placing a request. Sequencing previously performed externally now done in-house
Test	**Sample type**	**Container**	**Ref Ranges**	**Turnaround time**	**Additional requirements and other comments**
Complement, total alternative pathway	1 mL Serum	5ml GEL SST (Rust Top)	50-125 % of normal	21 days	**Separate and freeze immediately Transport frozen**
Complement, total classical pathway (THC)	1 mL Serum	5ml GEL SST (Rust Top)	50-125 % of normal	21 days	**Separate and freeze immediately Transport frozen**
Cyclic citrullinated peptide (CCP) antibodies	1 mL Serum	5 mL SST **(Gold top)**	<5 AU/mL	14 days	
DNA double stranded antibodies, quantitative	1 mL Serum	5ml GEL SST (Rust Top)	<30 iu/ml	10 days	
Endomysial IgA antibodies	1 mL Serum	5ml GEL SST (Rust Top)	Negative	14 days	
Enterocyte antibodies	1 mL Serum	5ml GEL SST (Rust Top)	Negative	28 days	Not currently performed in house; this test is referred to the Protein Reference Unit, Sheffield
Extractable nuclear (ENA) antibodies	1 mL Serum	5ml GEL SST (Rust Top)	Negative, Positive range : 0-40 AU/mL	10 days screen (14 days specificities)	Due to a change in equipment, this test is awaiting accreditation
Factor H and factor I	1 mL Serum	5ml GEL SST (Rust Top)	Antigenically present	28 days	

Test	Sample type	Container	Ref Ranges	Turnaround time	Additional requirements and other comments
GAD (glutamic acid decarboxylase) antibodies	1 mL Serum	5ml GEL SST (Rust Top) (Sterile Universal if CSF)	<5.0 AU/mL	21 days	
Gangliosideantibodies [includesGM1, GM2, GM3, GD1a, GD1b, GT1b, GQ1b]	1 mL Serum(Can also be performed on CSF)	5ml GEL SST (Rust Top) (Sterile Universal if CSF)	<500 = negative	28 days	Not currently performed in house; this test is referred to the Neuroimmunology Laboratory, Southern General Hospital, Glasgow
Gastric parietal cell antibodies	1 mL Serum	5ml GEL SST (Rust Top)	Negative	7 days	
Glomerular basement membrane (GBM) antibodies	1 mL Serum	5ml GEL SST (Rust Top)	<7 U/mL = Negative 7 – 10 U/mL = Equivocal >10 U/mL = Positive	5 days	
Haemophilus antibodies	1 mL Serum	5ml GEL SST (Rust Top)	0.15 mg/L (minimum protective level) 1 mg/L (optimum protective level)	28 days	Not currently performed in house; this test is referred to the Department of Immunology, Dudley Road Hospital, Birmingham. Not normally tested for patients >4yrs of age
Histone antibodies	1 mL Serum	5ml GEL SST (Rust Top)	Negative	28 days	Not currently performed in house; this test is referred to the Protein Reference Unit, Sheffield

Test	Sample type	Container	Ref Ranges	Turnaround time	Additional requirements and other comments
Immunoglobulin-g subclasses (IgG1-4)	1 mL Serum	5ml GEL SST (Rust Top)	Age related. See additional comments field.	14 days	Reference Range Adults IgG 1 : 3.2-10.2 g/L IgG 2 : 1.2-6.6 g/L IgG 3 : 0.2-1.9 g/L IgG 4 : 0-1.3 g/L Please note, values for children vary according to age .
Insulin antibodies	1 mL Serum	5ml GEL SST (Rust Top)	Negative	28 days	Not currently performed in house; this test is referred to the Protein Reference Unit in Sheffield.
Intrinsic factor antibodies	1 mL Serum	5ml GEL SST (Rust Top)	Negative	14 days	
Islet cell antibodies	1 mL Serum	5ml GEL SST (Rust Top)	Negative	14 days	
Jo-1 antibodies (Included in ENA screen)	1 mL Serum	5ml GEL SST (Rust Top)	Negative	14 days	
Liver autoantibodies immunoblot	1 mL Serum	5ml GEL SST (Rust Top)	Negative	14 days	[includes M2, PML, GP210, LKM1, LC1, SLA and SP100] Due to a change in equipment, this test is awaiting accreditation
Liver kidney stomach set	1 mL Serum	5ml GEL SST (Rust Top)	Negative	7 days screen (14 days confirmation)	
Liver kidney microsomal antibodies	1 mL Serum	5ml GEL SST (Rust Top)	Negative	7 days screen (14 days confirmation)	

Test	Sample type	Container	Ref Ranges	Turnaround time	Additional requirements and other comments
Lymphocyte functions	Whole blood	Adults 10-20 mL Lithium Heparin (green top) Children 5-10 mL Lithium Heparin (green top)	See report	10 days	samples should be accompanied by blood from a healthy control
Lymphocyte subsets	Whole Blood	4 ml EDTA (lavender top) Note: Other volumes can be accommodated including smaller volumes for Paediatric samples	See additional comments section for Adult ranges (>18 years) **NB:** values for children vary according to age	3 days	Lymphocyte subpopulations Adults CD3+ T lymphocytes % 55-83 CD3+ T lymphocytes Absolute 700-2100 CD3+/CD4+ T lymphocyte % 28-57 CD3+/CD4+ T lymphocyte Absolute 300-1400 CD3+/CD8+ T lymphocyte % 10-39 CD3+/CD8+ T lymphocyte Absolute 200-900 CD19+ B lymphocyte % 6-19 CD19+ B lymphocyte Absolute 100-500 CD3-/CD16-CD56+ NK cells % 7-31 CD3-/CD16-CD56+ NK cells Absolute 90-600 Absolute Lymphocytes 1000-2800
Mannose-binding lectin	1 mL Serum	5ml GEL SST (Rust Top)	See report	28 days	Not currently performed in house; this test is referred to the CameliaBotnar Laboratories at Great Ormond Street Hospital, London.
Mitochondrial antibodies	1 mL Serum	5ml GEL SST (Rust Top)	Negative	7 days screen (14 days confirmation)	
MuSK antibodies	1 mL Serum	5ml GEL SST (Rust Top)	Negative	28 days	Not currently performed in house; this test is referred to the Department of Immunology at the Churchill Hospital in Oxford.

Test	Sample type	Container	Ref Ranges	Turnaround time	Additional requirements and other comments
Myelin sheath antibodies	1 mL Serum(Can also be performed on CSF)	5ml GEL SST (Rust Top) (Sterile Universal if CSF)	Negative	28 days	Not currently performed in house; this test is referred to the Department of Immunology at the Churchill Hospital in Oxford.
Myeloperoxidase antibodies	1 mL Serum	5ml GEL SST (Rust Top)	See addition al comment field	5 days	Reference Range: <3.5 IU/mL = Neg 3.5 – 5 IU/mL= Equivocal >3.5 IU/mL = Pos
Myositis antibodies	1 mL Serum	5ml GEL SST (Rust Top)	Negative	28 days	[includes Mi2, PMScl, Ku, PL7,PL12, SRP, OJ and EJ] Due to a change in equipment, this test is awaiting accreditation
Neuronal antibodies	1 mL Serum(Can also be performed on CSF)	5ml GEL SST (Rust Top) (Sterile Universal if CSF)	Negative	14 days	[includes Hu, Yo, Ri, Ma2, CV2, Amphiphysin and GAD67] Due to a change in equipment, this test is awaiting accreditation
Neutrophil antibodies (granulocyte antibodies)	1 mL Serum	5ml GEL SST (Rust Top)	Negative	28 days	Not currently performed in house; this test is referred to the International Blood Group Reference Laboratory, Filton, Bristol
Neutrophil cytoplasmic antibodies	1 mL Serum	5ml GEL SST (Rust Top)	Negative	5 days	See also ANCA
Neutrophil function	Adults:10-20 mL whole blood. Children:5-10 mL whole blood	Adults: 10-20 mL Lithium heparin (green top) Children: 5-10 mL heparin (green top)	See report	7 days	**Do not separate or refrigerate** **Test within 24 hours**
NMDA-R ANTIBODY	1 mL Serum(Can also be performed on CSF)	5ml GEL SST (Rust Top) (Sterile Universal if CSF)	Negative	28 days	Not currently performed in house; this test is referred to the Department of Immunology at the Churchill Hospital in Oxford.

Test	Sample type	Container	Ref Ranges	Turnaround time	Additional requirements and other comments
Ovarian antibodies	1 mL Serum	5ml GEL SST (Rust Top)	Negative	14 days	
Parathyroid antibodies	1 mL Serum	5ml GEL SST (Rust Top)	Negative	28 days	Not currently performed in house; this test is referred to the Protein Reference Unit, Sheffield
Pneumococcal antibodies	1 mL Serum	5ml GEL SST (Rust Top)	See additional comments	14 days	**Adult reference value** Good level >39 U/ml **Paediatric reference value** *0-1 year Good level >14 U/ml 1-<2 years Good level >14 U/ml 2-<3 years Good level >19 U/ml 3-<4 years Good level >29 U/ml 4-<10 years Good level >44 U/ml 10-<18 years Good level >39 U/ml
PLA2R antibodies (M-type-phospholipase A2 receptor)	1 mL Serum	5ml GEL SST (Rust Top)	See additional comments	14 DAYS	Negative (normal) Range: <14 RU/ml Weak Positive Range: ≥14 to <20 RU/ml Positive Range: ≥20 RU/ml It is acceptable for serum samples to be sent by post as autoantibodies are stable for 2-3 days at room temperature .
Pneumococcal serotype	1 mL Serum	5ml GEL SST (Rust Top)	See report	28 days	**Not available to order on Cerner. Must be consultant request** Not currently performed in house; this test is referred to the Immunology Department in Cambridge
PR3 antibodies	1 mL Serum	5ml GEL SST (Rust Top)	See additional information field	5 days	<2 IU/mL = Neg 2 – 3 IU/mL = Equivocal >3 IU/mL = Pos

Test	Sample type	Container	Ref Ranges	Turnaround time	Additional requirements and other comments
Primary Immune Deficiency (PID) panel.	Whole blood	4 ml EDTA (purple top)	See report	14 days	
QuantiFERON®-TB Gold	Whole blood	2 x 6 mL Lithium heparin (green top)	Non-reactive	7 days	Samples must be received in the laboratory (Charing Cross) by 16:30 Monday to Friday for the test to be performed. Samples must be < 24 hours old on receipt in the lab
Rheumatoid factor (RF)	1 mL Serum	5 mL SST **(Gold top)**	<20 IU/ml	3 days	
Salivary gland antibodies	1 mL Serum	5ml GEL SST (Rust Top)	Negative	28 days	Not currently performed in house; this test is referred to the Protein Reference Unit, Sheffield.
Scl-70 antibodies (included in the ENA screen)	1 mL Serum	5ml GEL SST (Rust Top)	Negative	5 days	
Skin antibodies – pemphigus and bullous pemphigoid	1 mL Serum	5ml GEL SST (Rust Top)	Negative	28 days	Not currently performed in house; this test is referred to the Protein Reference Unit, Sheffield.
Smooth muscle antibodies	1 mL Serum	5ml GEL SST (Rust Top)	Negative	7 days screen (14 days confirmation)	
Specific IgE					See under Allergen Specific IgE
Striated muscle antibodies	1 mL Serum	5ml GEL SST (Rust Top)	Negative	28 days	Not currently performed in house; this test is referred to the Protein Reference Unit, Sheffield.

Test	Sample type	Container	Ref Ranges	Turnaround time	Additional requirements and other comments
Total IgE	Minimum 5ml.	5ml GEL SST (Rust/Yellow top)	Age dependent	14 Days	• Please note additional tubes are required if more than 10 allergens are requested. • For component resolved diagnostics testing 1 mL per allergen is required. • See also Allergen Specific IgE
T-cell activation markers	Whole Blood	4 ml EDTA (purple top)	See report	3 days	**Do not separate or refrigerate** **Test within 10 hours**
TB ELISPOT	Whole blood	6 mL Lithium heparin (green top)	Non-reactive	4 days	Samples must be received in the laboratory (Charing Cross) by 2pm Monday to Friday for the test to be performed
Tetanus antibodies	1 mL Serum	5ml GEL SST (Rust Top)	Minimum protective level >0.15IU/mL	14 days	
Thyroid peroxidase (TPO) antibodies	1 mL Serum	5ml GEL SST (Rust Top)	<75 AU/mL	7 days	
Thyroid stimulating hormone receptor (TSHR) antibodies	1 mL Serum	5ml GEL SST (Rust Top)	<0.4 AU/mL	21 days	
Tissue transglutaminase antibodies	1 mL Serum	5ml GEL SST (Rust Top)	<10 AU/mL	7 days	Additional Confirmatory tests: turnaround time 14 days
Anti-TNF drug levels Anti- TNF drug neutralising antibodies	5 ml Serum	5ml GEL SST (Rust Top)	N/A	Drug levels = 2 weeks Neutralising antibodies = 4 weeks	(Infliximab IFX, Adalimumab ADA, Etanercept ETA) Perform venesection BEFORE next drug infusion

Test	Sample type	Container	Ref Ranges	Turnaround time	Additional requirements and other comments
Serum Tryptase	Minimum 5ml.	5ml GEL SST (Rust/Yellow top)	2 – 14µg/L	14 days	See here
Vaccine-specific ab					See individual Haemophilus, pneumococcus and Tetanus test information
Vedolizumab Trough level	1 mL Serum	5ml GEL SST (Rust Top)	Results are reported between 0.8µg/ml and 96.0µg/ml.	4 weeks	Samples should be taken just before the next infusion of drug (trough) Transportation at room temperature/ first class post is adequate. Storage at 4 degrees or -20 for long term In the induction phase of the Entyvio© clinical trials week 6 trough levels were higher in responders than non-responders and higher trough levels were associated with increased mucosal healing in UC patients *Currently awaiting accreditation for this test*
Voltage gated calcium	1 mL Serum	5ml GEL SST (Rust Top)	0-45 pM	28 days	Not currently performed in house; this test is referred to the Department of Immunology at the Churchill Hospital in Oxford.
Voltage gated potassium channel antibodies	1 mL Serum	5ml GEL SST (Rust Top)	Normal 0 - 69 Equiv: 70 – 130 Positive: >130 (pM/L)	28 days	Not currently performed in house; this test is referred to the Department of Immunology at the Churchill Hospital in Oxford.

H&I Hammersmith Test Repertoire (see also General Notes on Infection & Immunity tests requirements in previous section)

Test	Sample Type & Volume	Container	Ref Ranges	Turnaround time	Additional requirements and other comments
HLA antibody testing	10 ml Serum	Red top preferred, SST (gold top) acceptable	N/A	Please consult the laboratory	• Samples must be sent via first class post or courier. • It is important to record the sample date when requesting these tests. • Please provide HIV and hepatitis B status. • Results are held with the patient history, and are not routinely reported for individual samples
HLA antibody identification	10 ml Serum	Red top preferred, SST (gold top) acceptable	N/A	Please consult the laboratory	• Samples must be sent via first class post or courier. • It is important to record the sample date when requesting these tests. • Please provide HIV and hepatitis B status. • Results are held with the patient history, and are not routinely reported for individual samples
HLA crossmatch	20 mL Whole Blood (**Donor**) 10 mL serum (**Recipient**)	EDTA (4ml purple / 6 ml pink top) **(Donor)** Serum (red top) preferred, SST (gold top) accepted (**Recipient**)	Interpretive report provided	Please consult the laboratory	BOTH samples must be <24 hours old
HLA high resolution typing	20 mL Whole Blood	EDTA (4ml purple / 6 ml pink top)	Interpretive report provided	30 days	Samples must be sent via first class post or courier. In cases where HLA typing is used prognostically, or as a tool to aid diagnosis, it is essential that the request includes information on the suspected condition(s). High resolution typing is normally performed after basic or low resolution HLA typing, and the cost is therefore additional to the cost of basic typing. There is no test request code for high resolution typing; the test is performed based on clinical relevance or on request as discussed with the laboratory.
HLA typing	20 mL Whole Blood	EDTA (4ml purple / 6 ml pink top)	Interpretive report provided	30 days	Samples must be sent via first class post or courier
HLA-B*27 Typing	5-10 mL Whole Blood	EDTA (4ml purple / 6 ml pink top)	Negative	14 days	Samples must be sent via first class post or courier
HLA-B*57:01	5-10 mL Whole Blood	EDTA (4ml purple / 6 ml pink top)	Negative	14 days	

Virology Test Repertoire (see also General Notes on Infection & Immunity tests requirements in previous section)

Test	Sample type	Container	Ref Ranges	Turnaround time	Additional requirements and other comments
Atypical pneumonia screen	Serum	5 ml GEL SST (Rust Top)	See comment	7 days	Significant antibody titres will be > 16 or 32, depending on infective agent
CMV IgG antibodies by EIA	Serum	5 ml GEL SST (Rust Top)	Negative	3 days	*Due to a recent change in analytical platform, this test is not currently UKAS accredited.*
CMV IgM antibodies by EIA	Serum	5 ml GEL SST (Rust Top)	Negative	5 days	Please give detailed clinical information, including date of onset/contact with the suspected infection. *Due to a recent change in analytical platform, this test is not currently UKAS accredited.*
CMV Quantitative PCR	Whole blood	6 ml EDTA (Pink Top)	N/A	3 days	10 ml EDTA tubes also accepted
Rotavirus/adenovirus /norovirus antigen	**Performed by Microbiology laboratory. See Microbiology repertoire**				
EBV DNA quantitative PCR	Whole Blood	EDTA Blood (pink top)	N/A	4 days	10 ml EDTA tubes also accepted
Epstein-Barr virus (EBV) VCA IgG antibodies by EIA	Serum	5 ml GEL SST (Rust Top)	See report	7 days	Past or recovery phase of infectious mononucleosis
Epstein-Barr virus (EBV) VCA IgM antibodies by EIA	Serum	5 ml GEL SST (Rust Top)	Negative	7 days	Suspected Acute Infectious mononucleosis infection
Epstein Barr virus (EBV) EBNA IgG	Serum	5 ml GEL SST (Rust Top)	N/A	7 days	
Hepatitis A IgM antibodies, hepatitis A serology	Serum	5 ml GEL SST (Rust Top)	Negative	3 days	Acute infection – jaundice with ALT >300 µ/L and/or raised bilirubin. Please give detailed clinical information, including date of onset/contact with the suspected infection

Test	Sample type	Container	Ref Ranges	Turnaround time	Additional requirements and other comments
Hepatitis B core total antibodies (IgG/IgM)	Serum	5 ml GEL SST (Rust Top)	Negative	3 days (Confirmation: non-negatives up to 10 days)	Indicates past infection - requested alongside hepatitis B surface antigen to rule out current or previous infection in non-responders to hepatitis B vaccine
Hepatitis B antibodies, hepatitis B surface antibodies	Serum	5 ml GEL SST (Rust Top)	Negative	3 days	Post vaccination check for seroconversion
Hepatitis B surface antigen, hepatitis B serology, HBV testing	Serum	5 ml GEL SST (Rust Top)	Negative	3 days (Confirmation: non-negatives up to 10 days)	Acute/Chronic Hepatitis B Infection.
Hepatitis B Quantitative DNA(Hepatitis B viral load)	Whole Blood	6 ml EDTA (Pink Top)	Negative	5 days	10 ml EDTA tubes also accepted
Hepatitis C virus (HCV) antibodies by EIA	Serum	5 ml GEL SST (Rust Top)	Negative	7 days	Screening test for antibodies to hepatitis C virus
Hepatitis C virus (HCV) Antigen by EIA	Serum	5 ml GEL SST (Rust Top)	Negative	5 days	*Currently awaiting accreditation for this test*
Hepatitis C Quantitative RNA (Hepatitis C viral load)	Whole Blood	6 ml EDTA (Pink Top)	N/A	7 days	10 ml EDTA tubes also accepted
HCV Genotyping	EDTA whole blood	6 ml EDTA (Pink Top)	N/A	7 days	10 ml EDTA tubes also accepted
Hepatitis D virus	Serum	5 ml GEL SST (Rust Top)	Negative	14 days	Not currently performed in house; this test is referred to Virology at University College Hospital
Hepatitis E virus	Serum	5 ml GEL SST (Rust Top)	Negative	14 days	Serology for IgM and IgG, Current or Past Infection. *Currently awaiting accreditation for this test*
Herpes simplex virus IgG	Serum	5 ml GEL SST (Rust Top)	Negative	7 days	
HIV 1/2 antibodies EIA	Serum/Saliva	5 ml GEL SST (Rust Top) /	Negative	3 days (Confirmation:	Screening test for HIV antibodies : Please give detailed clinical information, including the date of

		250ul Saliva Sponge		non-negatives up to 10 days)	onset/contact with the suspected infection
Test	Sample type	Container	Ref Ranges	Turnaround time	Additional requirements and other comments
HIV-1 Resistance (Integrase)	10 ml Whole blood	6 ml EDTA (Pink Top)	Contact Laboratory	14 days	Must have quantifiable HIV-1 viral load. 10 ml EDTA tubes also accepted. Sequencing previously performed externally now done in-house
HIV-1 Resistance (Protease & reverse transcriptase)	1 ml Plasma or Serum	6 ml EDTA (Pink Top) OR 5 ml GEL SST (Rust Top)	Contact Laboratory	14 days	Must have quantifiable HIV-1 viral load. 10 ml EDTA tubes also accepted
HIV-1 Tropism testing	10 ml Whole blood	6 ml EDTA (Pink Top)	Contact Laboratory	14 days	Must have quantifiable HIV-1 viral load. 10 ml EDTA tubes also accepted Sequencing previously performed externally now done in-house
HIV-1 VIRAL LOAD	Whole Blood	6 ml EDTA (Pink Top)	N/A	5 days	Specimens for HIV viral load must be received in the laboratory within 4 hours of collection or if taken out of hours, refrigerated overnight at and transported the next day. 10 ml EDTA tubes also accepted
HSV PCR	Virology swabs	Universal transport medium	N/A	5 days	
HTLV 1 and 2 antibodies by EIA	Serum	5 ml GEL SST (Rust Top)	Negative	3 days (Confirmation: non-negatives up to 10 days)	
Measles virus IgG antibodies	Serum	RST (Rust top) 5 mL	See report	5 days	Detection of IgG antibodies to measles virus to determine immunity status. This test is not routinely available for confirmation of immunity/vaccine uptake. If there is no history of vaccination or past infection, MMR should be offered in preference.
Measles virus IgM antibodies	Serum	RST (Rust top) 5 mL	See report		Suspected measles. Please give detailed clinical information, including date of

				5 days	onset/contact with the suspected infection.
Test	**Sample type**	**Container**	**Ref Ranges**	**Turnaround time**	**Additional requirements and other comments**
Mumps virus IgG antibodies	Serum	5ml GEL SST Rust Top	See report	5 days	Past infection or vaccination
Mumps virus IgM antibodies	Serum	5ml GEL SST Rust Top	Negative	5 days	Please give detailed clinical information, including date of onset/contact with the suspected infection
Mycoplasma pneumoniae EIA	Serum	5ml GEL SST (Rust Top)	Negative	7 days	Requests for Mycoplasma pneumoniae, Chlamydia psittaci and Coxiellaburnetii are to the Biomnis laboratories. Testing will be performed by a combination of enzyme immunoassay and immunofluorescence assays,
ParvoIgG&IgM	Serum	5ml GEL SST (Rust Top)	See report	10 days	Recent/past infection
Respiratory PCR	Nose and throat swabs NPA, BAL, ETA	Universal transport medium Sterile Universal	N/A	1 days (See note)	Turnaround time is 3 days for CMV PCR and PCP. *The Enterovirus and Parechovirus tests on the overall panel are newly implemented and awaiting assessment for accreditation. Influenza B is currently additionally tested using a newly implemented test and awaiting assessment for accreditation.*
Rubella virus IgG antibodies by EIA /Rubella immunity screen	Serum	5ml GEL SST (Rust Top)	>10 IU/mL	3 days	Antibody levels below 10 IU/mL may be insufficient to provide protection from clinical illness upon exposure to rubella virus
Rubella virus IgM antibodies by EIA	Serum	5ml GEL SST (Rust Top)	See comment	7 days	Please state gestation period, date and nature and ?pregnant The presence of antibody levels of at least 10 IU/mL of sample is indicative of past exposure to rubella virus
Varicella zoster IgG antibodies	Serum	5ml GEL SST (Rust Top)	See report	3 days	Past Infection. *Due to a recent change in analytical platform, this test is not currently UKAS accredited*
Viral Detection (PCR)	CSF, Plasma		Negative	5 days	Includes HHV6, HHV8, JCV Virus, Parvovirus, Parechovirus, Enterovirus, HSV EBV (CSF) and CMV (CSF). Not currently performed in house; this test is referred to Micropathology, Coventry
Varicella zoster PCR	CSF / Swab Plasma	VTM if swab sent	Negative	5 days	Not currently performed in house; this test is referred to Micropathology, Coventry

Microbiology Serology Test Repertoire (see also General Notes on Infection & Immunity tests requirements in previous section)

Test	Sample Type	Container	Ref Ranges	Turnaround time	Additional requirements and other comments
5-flucytosine levels	5-flucytosine levels and other antifungal assays Voriconazole, Posaconazole, Itraconazole and Hydroxy-Itraconazole are no longer managed by NWL Pathology. This service is now performed by the Leslie Brent Laboratory at Hammersmith Hospital who should be contacted regarding any enquiries for these tests. Questions or information requests about the service provided should be directed to the Brent lab by email: leslie.brentlab@imperial.nhs.uk or by contacting the laboratory on 020 331 36637.				
Amoebic antibodies	Serum	5 ml GEL SST (Rust Top)	See report	21 days	Not currently performed in house; this test is referred to Quest Diagnostics
Ascaris Antibodies	Serum	5 ml GEL SST (Rust Top)	See report	21 days	Not currently performed in house; this test is referred to Quest Diagnostics
Anti-staphylococcal antibodies	Serum	5 ml GEL SST (Rust Top)	Negative	21 days	Not currently performed in house; this test is referred to Public Health England, Colindale
Aspergillus precipitins	Serum	5 ml GEL SST (Rust Top)	See report	21 days	Not currently performed in house; this test is referred to Bristol Royal Infirmary
Anti-streptolysin-O	Serum	5 ml GEL SST (Rust Top)	See Report	4 days	
Avian precipitins	Serum	5 ml GEL SST (Rust Top)	Negative	21 days	Not currently performed in house; this test is referred to Bristol Royal Infirmary
Bartonella serology	Serum	5 ml GEL SST (Rust Top)	Negative	21 days	Not currently performed in house; this test is referred to Public Health England, Colindale
Bordetella pertussis antibodies	Serum	5 ml GEL SST (Rust Top)	Negative	21 days	Not currently performed in house; this test is referred to Public Health England, Colindale
Botulinum toxin	Serum	5 ml GEL SST (Rust Top)	Negative	21 days	**Contact the laboratory to discuss the appropriateness of the investigation.** Referred to Public Health England, Colindale
Brucella antibodies	Serum	5 ml GEL SST (Rust Top)	Negative	14 days	Not currently performed in house; this test is referred to the *Brucella* Diagnostics Unit, Liverpool.
Coccidioides Abs	Serum	5 ml GEL SST (Rust Top)	See report	2-5 days	Not currently performed in house; this test is referred to the Mycology Reference Lab, Bristol

Test	Sample Type	Container	Ref Ranges	Turnaround time	Additional requirements and other comments
Cystercercosis antibodies	Serum	5 ml GEL SST (Rust Top)	Negative	21 days	Not currently performed in house; this test is referred to The Hospital for Tropical Diseases, London.
Entamoebahistolytica Abs	Serum	5 ml GEL SST (Rust Top)	See report	21 days	See Amoebic antibodies
Fasciola Antibodies	Serum	5 ml GEL SST (Rust Top)	Negative	21 days	Not currently performed in house; this test is referred to The Hospital for Tropical Diseases, London.
Filarial Antibodies	Serum	5 ml GEL SST (Rust Top)	Negative	21 days	Not currently performed in house; this test is referred to Quest Diagnostics
Histoplasma antibodies	Serum	5 ml GEL SST (Rust Top)	Negative	21 days	Not currently performed in house; this test is referred to the Mycology Ref Lab, PHE, Bristol
Hydatid antibodies	Serum	5 ml GEL SST (Rust Top)	Negative	21 days	Not currently performed in house; this test is referred to Quest Diagnostics
Legionella antibodies	Serum	5 ml GEL SST (Rust Top)	Negative	21 days	Preferred test is the *Legionella* antigen test.
Leishmania antibodies	Serum	5 ml GEL SST (Rust Top)	See report	21 days	Not currently performed in house; this test is referred to Quest Diagnostics
Leptospira antibodies	Serum	5 ml GEL SST (Rust Top)	Negative	21 days	Not currently performed in house; this test is referred to the *Leptospira* Reference Unit in Hereford
Lyme IgG or Borrelia antibody screen	Serum	5 ml GEL SST (Rust Top)	Negative	8 days (Non Negative Results 10 - 14 days)	Positive Samples are sent to the Public Health England reference laboratory at Porton Down, Salisbury Please review new guidance on *Borrelia* testing
Lyme IgM or Borrelia antibody screen	Serum	5 ml GEL SST (Rust Top)	Negative	8 days (Non Negatives 10 - 14 days)	Positive Samples are sent to the Public Health England reference laboratory at Porton Down, Salisbury Please review new guidance on *Borrelia* testing
Meningococcal PCR	Serum	6 ml EDTA (Pink Top)	Negative	3 days	Not currently performed in house; this test is referred to Manchester Royal Infirmary.

Test	Sample Type	Container	Ref Ranges	Turnaround time	Additional requirements and other comments
Rickettsial antibodies	Serum	5 ml GEL SST (Rust Top)	Negative	21 days	Not currently performed in house; this test is referred to the Public Health England Reference Laboratory at Porton Down, Salisbury
Schistosomal antibodies	Serum	5 ml GEL SST (Rust Top)	See report	21 days	Not currently performed in house; this test is referred to Quest Diagnostics
Strongyloides antibodies	Serum	5 ml GEL SST (Rust Top)	Negative	21 days	Not currently performed in house; this test is referred to Quest Diagnostics
RPR (Rapid Plasma Reagin)	Serum	5 ml GEL SST (Rust Top)	Negative	7 days	Usually performed as part of Syphilis screening test.
Syphilis screen	Serum	5 ml GEL SST (Rust Top)	Negative	3 days	
Toxocara Antibodies	Serum	5 ml GEL SST (Rust Top)	Negative	21 days	Not currently performed in house; this test is referred to Quest Diagnostics
Toxoplasma screen	Serum	5 ml GEL SST (Rust Top)	Negative (<1:16)	7 days	Samples giving a positive screening test result will be reported as such and sent to a reference laboratory for further tests.
Trichinella antibodies	Serum	5 ml GEL SST (Rust Top)	Negative	21 days	Not currently performed in house; this test is referred to Quest Diagnostics
Trypanosomal Antibodies	Serum	5 ml GEL SST (Rust Top)	Negative	21 days	Not currently performed in house; this test is referred to The Hospital for Tropical Diseases, London.
Weil's disease					(please also see Leptospira antibodies)
Whipples PCR	Whole Blood	6 ml EDTA (Pink Top)	Negative	21 days	Not currently performed in house; this test is referred to Micropathology, Coventry
Yersinia antibodies	Serum	5 ml GEL SST (Rust Top)	Negative	21 days	Referred to Public Health England, Colindale

Reference laboratories

At times, it may be necessary to refer work to other laboratories or consultants. The department routinely sends work to the following organisations:
Please refer to the UKAS website http://www.ukas.com/search-accredited-organisations/ for UKAS accredited laboratories and clinical-pathology-accreditation for those currently transitioning from CPA accreditation.

List of Reference Laboratories

Reference laboratory Name and Address	Test(s) performed	Phone Number
Addenbrookes Hospital Cambridge, Clinical Immunology, Box 109, Level E4, Addennbrooke's Hospital, Hills Road, Cambridge CB2 0QQ	Pneumococcal Serotyping	01223 348145 (x 58145)
	IFN autoantibodies,	
	Il-17, IL-12, Il-6 antibodies	
	GM-CSF autoantibodies	
Antimicrobial Assay Reference Laboratory, Dept Of Medical Microbiology, Lime Walk Building, North Bristol NHS Trust, Southmead Hospital, Westbury on Trym, Bristol BS10 5NB	Teicoplanin,	0117 414 6220 / 6269
	Cycloserine,	
	Colistin	
	Rifampicin	
	Tobramicin	
	Aciclovir,	
	Gancyclovir	
	Streptomycin	
	Rifabutin	
Antimicrobial resistance and healthcare associated infections reference unit (AMRHAI) Public Health England, 61 Colindale Avenue, London, NW9 5EQ	Staphylococcal antibody	020 8327 7887
BIOMNIS, 17/19 Avenue Tony Garnier, 69007 Lyon, France	Ethambutol levels	0117 414 6220 / 6269
	Isoniazid levels	0117 414 6220 / 6269
	Bartonella	+33 4 72 80 10 10
	Amoebic serology	
	Ascaris serology	
	chinococcus, serology/PCR	
	Hydatid	
	Filaria serology	
	Leishmania serology	
	Stronglyoides serology	
	Schistosoma	
	Toxocara	
	T.Brucei	
	T.cruzi	
	T. gambiense	
	HSV 1&2 IgG type specific serology	
	Cysticercosis	
	Fasciola,	
	Trichinella	
	Mycoplasma pneumoniae serology	
	Chlamydai psittaci serology	
	Chlamydia trachomatis /LGV serology	
	Coxiella burnetii serology	
	Streptococcal anti-DNase B	
	Yersinia Ab	

	Allergy components	
	ISAC Allergy components	
	Campylobacter serology	
	Anaplasma serology	
	Brucella Antibodies	
Bone Marrow Laboratory, Level 2, Camelia Botnar Labs, Great Ormond Street Hospital for Children, Great Ormond Street, London WC1N 3JH	T Cell Receptor Excision Circles (TRECS) Analysis.	020 7829 7901
Cardiff Toxicology Laboratories, The Academic Centre, University Hospital Llandough, Penarth, Vale of Glamorgan CF64 2XX	asperIsoniazid	029 2071 6894
Centre For Virology, Royal Free Hospital, Hampstead Site, Rowland Hill Street, London, NW3 2PF	CMV Avidity, Elecron micriscopy	020 344 78994
Clinical Immunology Laboratory, Level 4, Camelia Botnar Labs, Great Ormond Street Hospital for Children, Great Ormond Street, London WC1N 3JH	SAP Protein level	020 7829 8835
	Gamma/Delta T Cells (double negatives)	
	Confirmatory neutrophil function tests	
	Lymphocyte proliferation assays	
Clinical Microbiology and Virology, UCLH NHS Foundation Trust, 60 Whitfield Street, London, W1T 4EU	Hepatits D Serology & PCR, HIV2 Viral Load	0203 447 8964 0207 307 7373 SPRs: 0203 447 8986
Department of Immunology, Churchill Hospital, Headington , Oxford OX3 7LG	Voltage gated potassium	01865 225995
	Voltage gated calcium	
	Acetyl Choline receptor antibody	
	NDMA receptor antibodies	
	anti-MAG antobodies	
	Aquaporin antibodies	
	Muscle kinase Antibodies	
	Haemophilus antobodies	
Dept Of Virology, Public Health Laboratory, Birmingham Heartlands Hospital, Bordesley Green East, Birmingham B9 5SS	Hepatits B viral load	
Dr Abid Karim, Neuroimmunology, The Medical School, University of Birmingham, Edgbaston, Birmingham B15 2TT	Specific paraneoplastic autoantibodies, Confirmatory neuronal antibodies	0121-415-8797
Gastrointestinal bacteria reference unit (GBRU) , 61 Colindale Avenue London NW9 5HT	E.coli VTEC	020 7679 9490
Meningococcal / Pneumococcal Reference Laboratory, PO Box 209, Clinical Science Building, Manchester Royal Infirmary, Oxford Rd, Manchester M13 9WZ	Meningococcal Ab, Meningococcal PCR	0161 276 6757
Microbiology Department St Helier Hospital Wrythe Lane Carshalton SM5 1AA	Entovirus IgM Antibodies	01372 735 994, 020 8641 4011
Micropathology Ltd. University Of Warwick Science Park, Barclays Venture Centre, Sir William Lyons Road, Coventry, West Midlands, CV4 7EZ	Hepatitis B Resistance Genotyping	02476 323222
	Adenovirus PCR	
	HHV6 PCR	
	HHV7 PCR	
	HIV Proviral HIV 1	
	JC PCR	
	BK PCR	

	HSV PCR	
	VZV PCR	
	Parvovirus PCR	
	Respiratory Viral Screen	
	PCR PCR	
	Mycoplasma PCR	
	CMV PCR	
	EBV PCR	
	Enterovirus PCR	
	Parechovirus PCR	
	Human Metapneumovirus PCR	
	Hepatitis C Q80K polymorphism	
	Whipples PCR	
Mycology Reference Laboratory (PHE), Myrtle Rd, Kingsdown, Bristol BS2, 8EL	Aspergillus Antigen	0117 342 5028
	Aspergillus Precipitins	
	Avian Preciptins	
	Candia Precipitins	
	Beta Glucan	
	Histoplasma serology	
	Coccidioides serology	
Neuro immunology and CSF Laboratory Institute of Neurology (NHNN) Box 76 Queen Square London WC1N 3BG	Ganglioside antibodies	0141 354 9010/9023
	Vascular endothelial growth factor	020 33483814
	basal ganglia antibodies	
PAEDIATRIC: Clinical Immunology Laboratory, Level 4, Camelia Botnar Labs, Great Ormond Street Hospital for Children, Great Ormond Street, London WC1N 3JH. **ADULT:** Dr Helen Lachmann, National Amyloidosis Centre, Royal Free and University College London Medical School Dept of Medicine, Royal Free Campus, Rowland Hill Street, London NW3 2PF	Periodic Fever genetic testing (FMF, TRAPS, CINCA/NOMID, MWS, HIDS)	020 7433 2725
Rabies Diagnostic Unit, Veterinary Laboratories Agency, New Haw, Addlestone, Surrey, KT15 3NB.	Rabies	
Rainer Doffinger, Addenbrookes Hospital Cambridge, Clinical Immunology, Box 109, Level E4, Addennbrooke's Hospital, Hills Road, Cambridge CB2 0QQ	Cytokine antibodies	01223 217441 (x3441)
Rare and Imported Pathogens Laboratory, (RIPL), PHE, Manor Farm Road, Porton Down, Wiltshire, SP4 0JG	Lyme confirmation	01980 612100/01980 612348
	Rickettsia serology	
	Leptosira serology	
	Dengue Serology	
	Arbovirus Serology	
	Phlebovirus Serology	
	Hantaan & VHF serology	
Regional Molecular genetics Laboratory, Level 6, York House, Great Ormond Street NHS Trust, 37 Queen's Square, London WC1N 3BH	Sap DNA analysis	020 7405 9200 ext 6888
Respiratory and vaccine preventable bacteria reference unit (RVPBRU), 61 Colindale Avenue London NW9 5HT	Bordetella	0208 200 4400
Sexually transmitted bacteria reference unit (STBRU)), 61 Colindale Avenue London NW9 5HT	Syphilis confirmation, Mycoplasma genitalium PCR	020 7679 9490

Steve Kaye, Molecular Diagnostic Unit -Jefferiss Trust Laboratory, St Mary's Campus, London W2 1PG	Integrase resistance (St Mary's samples)	
	Hepatits C Genotyping	
	Hepatits C resistance	
	HIV Resistance (St Mary's Samples)	
	Tropism (v3 loop) (St Mary's samples)	
Supraregional Protein Reference Unit & Department of Immunology, PO Box 894, Sheffield S5 7YT.	Entrocyte antibodies	0114 271 5552
	Hsitone antibodies	
	Striated muscle abs	
	Cardiac muscle abs	
	Manose binding lectin	
	Insulin antibodies	
	Parathyroid antibodies	
	Salivary Gland antibodies	
	IgD level	
	Parathyroid Ab	
	Salivary Gland antibodies	
	C1 Inhibitor genetic analysis (Serping sequencing)	
Supraregional Protein Reference Unit & Department of Immunology, PO Box 894, Sheffield S5 7YT.* (C&W samples only: Immunodermatology laboratory, St John's Institute of Dermatology, St Thomas' Hospital, Westminster Bridge Road, London SE1 7EH, 020 7188 6408)	Skin basement membrane antibodies	0114 271 5552
The Glasgow Neuroimmunology Laboratory, Level 1B, Laboratory Medicine & Facilities Building, Queen Elizabeth University Hospital, 1345 Govan Road GLASGOW, G51 4TF	Confirmatory Neuronal antibodies	
Toxoplasma Reference Laboratory, Department of Microbiology (PHE) Singleton Hospital, Swansea SA2 8QA	Toxplasma serology & PCR	01792 285058
Viapath, London Specialist Virologist Centre, Health Protection Agency London, , King's College Hospital NHS Foundation Trust, 2nd Floor Cheyne Wing, Bessemer Road, Dulwich, SE5 9RS	Quantitative VZV Ab	020 3299 6155
Virus Reference Division, Centre For Infections, Health Protection Agency, 61 Colindale Avenue, London NW9 5EQ	Syphilis PCR,	02476 323222
	Haemophilus ducreyi PCR	
	HTLV Confirmation	
	Hepatitis A	
	Hepatitis B Confirmation	
	Hepatitis C Confirmation	
	HIV antibody Confirmation	
	Parvovirus Serology & PCR	
	Rabies Antibodies	
	Rubella IgG Avidity	
	Rubella IgM	
	HIV Incidence	

Note: Anti-fungal Assays:

5-flucytosine levels and other antifungal assays Voriconazole, Posaconazole, Itraconazole and Hydroxy-Itraconazole are no longer managed by NWL Pathology. This service is now performed by the Leslie Brent Laboratory at Hammersmith Hospital who should be contacted regarding any enquiries for these tests. Questions or information requests about the service provided should be directed to the Brent lab by email: leslie.brentlab@imperial.nhs.uk or by contacting the laboratory on 020 331 36637.

MICROBIOLOGY LABORATORY- ALL SITES

MICROBIOLOGY LABORATORY LOCATION

The Microbiology Service is provided from laboratories based on the 4th Floor Laboratory Block, Charing Cross Hospital.

The Microbiology Serology service is provided from laboratories based on the 9th Floor Laboratory Block as part of the Department of Infection & Immunity.

For information on Microbiology Serology test repertoire and turnaround times, please see additional information under the Department of Infection and Immunity pages above.

DESCRIPTION OF SERVICE

The department provides a full range of diagnostic services including bacterial culture, parasite identification, mycological services and TB microbiology.

LABORATORY HOURS

Monday to Friday	08.00 – 20.00 (normal service)
Sat/Sun	08.00 – 20.00 (reduced service)

Out-of-hours service covering

Mon – Sun	20.00 – 08.00 (*Emergency specimens only*)

KEY PERSONNEL

The NWL Pathology Infection & Immunity Clinical Lead is Consultant Immunologist Dr Peter Kelleher and the Microbiology specialist Lead is Dr. Hugo Donaldson. Angela Jean-François (nee Hall) is the Divisional Manager for Infection & Immunity Sciences.

See following page for a full list of personnel and contact names. All telephone extension numbers given can be called directly from outside of the Trust by prefixing with **020 331** and then the five digit extension number.

MICROBIOLOGYCONTACT NUMBERS

(5 digit extensions prefixed by 020 331 if calling externally)

Site	Contact	Name	Tel No.	Bleep	Other
Cross Site	**Results/Enquiries**		**35353**		
	Divisional Manager	Angela Jean-François	17262		via Switchboard
	Consultant (Speciality Lead for Microbiology)	Dr Hugo Donaldson* *(See also WMUH site)*	0208 321 5784		via Switchboard
GPs	**GP only clinical advice enquiries**		**07827 904 038**		
Charing Cross *(Laboratory based on this site)*	**Charing Cross Hospital clinical advice enquiries** *(voicemail available)*		**17801 / 17802**	**2068**	
	Laboratory Manager	Manfred Almeida	17262	Mobile 07827 904062	
	Specialist Scientist	Sweenie Goonesekera	17883		
	Specialist Scientist	Monica Rebec	17883		
	Consultant	Dr. Giovanni Satta	17256		via Switchboard
	Consultant	Dr. Trupti Patel	17256		
	I&I Sciences Governance & Quality Manager	Emer Fahy	15175		
	Department secretary		17262 / 17257		
	Departmental Fax		17261		
	On-Call BMS			0248	
St Mary's	**St Mary's hospital clinical advice enquiries**		**21562**		
	Consultant	Dr Dunisha Samarasinghe	21074		via Switchboard
	Consultant	Dr Jim Hatcher	21817		via Switchboard
	Specialist Registrars		21562 / 25345	1010	
Hammersmith	**Hammersmith hospital clinical advice enquiries**		**32075 / 73** *(not manned during ward rounds)*		
	Specialist Registrars		31973/3207 3/75	5008	
	Consultant	Dr Anan Ghazy			
	Consultant	Dr. Frances Davies	31974 / 32073		via Switchboard
	Consultant	Dr. Kathy Bamford	32080		via Switchboard
	Consultant	Ximena Gonzalo	31973		
	Microbiology Specimen Reception at HH		32060		
Chelsea & Westminster	**Specialist Registrars**		**58273 / 57264**	**4318 / 7260**	
	Consultant	Dr. Nabeela Mughal	57259 / 57264		via Switchboard
	Consultant	Dr. Luke Moore	58273 / 57264		
West Middlesex University Hospital	Consultant	Dr. Hugo Donaldson* *(based primarily at WMUH)*	0208 321 5784		
	Consultant	Dr. Farhana Butt	0208 321 6882		
	Consultant	Dr. Nupur Goel	0208 321 6539		

SPECIMEN INFORMATION AND ADDITIONAL TESTS

If samples cannot be sent to the laboratory immediately they should be kept at 4℃ to prevent bacterial growth. The exception is blood cultures where they should be sent immediately to the Microbiology Department for incubation at 37℃.

For information on how to collect blood cultures, refer to the following on the Trust Intranet: "Guidelines for taking Peripheral Blood Cultures from Adults"

http://source/prdcont/groups/extranet/@clinical/@guidelines/documents/ppgs/id_026258.pdf

There is no need to telephone or bleep the BMS when sending blood cultures; they are all dealt with as urgent.

Sputum samples received in the laboratory more than 12 hours after being taken and salivary specimens are not cultured for respiratory pathogens other than TB if requested. Unless in-patient urine specimens are clearly unrepeatable e.g. because treatment is about to be started, they *will not be processed* if received more than 12 hours after being taken.

Requests for additional tests must be made via the Medical Microbiologists who will approve them on a case-by-case basis. Time limits for requesting additional tests vary according to specimen type and should be discussed as above.Culture plates are kept for 48 hoursand sample retention times include 48 hours for Urines for MC&S, 1 week for Swabs while Fluids and tissues are kept for 1 month.

Labelled specimens should be sent immediately in non-leak containers, details of presumptive diagnosis, recent antibiotic treatment, foreign travel, pets, immunisation and suspected contact with infectious diseases. Urgent requests during routine hours must be telephoned to the laboratory via the Pathology call centre. The call centre will transfer callers through to the relevant area.

Collect specimens before starting antibiotic treatment.
Where swabs are used ensure transport medium swabs are used. Prompt delivery of pus or body fluids is essential.

Direct plating of certain material may be advisable and can be arranged with the laboratory.

ENQUIRIES

Always order investigations through the hospital Cerner computer system. All results are on Cerner; please use this facility rather than telephoning the laboratory.
Please see the normal turn round times for reporting of specimens before contacting the laboratory. Where bacteriological findings need urgent action, results will be telephoned. All positive blood cultures are telephoned as a matter of routine. Medical advice is available at all times. If you are uncertain about a particular test or the significance of any result, please contact one of the medical microbiologists.

See site specific contact details above for general enquiries and Microbiology medical staff.

SpRs	Charing Cross	Bleep2068
	St Mary's	Bleep 1010
	Hammersmith	Bleep 5008
Out-of-hours	Via switchboard	

TRANSPORT OF SAMPLES TO THE LABORATORY

For details on how to send samples to the laboratories, including by courier, please refer to appropriate sections below for Routine, Weekend and out of hours requests where details are given per hospitalsite.Note there are specific arrangements in place for each site.

REQUESTS FOR ROUTINE INVESTIGATIONS

St Mary's Hospital (Monday to Friday 0900-1700)

Specimens will be transported from Clinical Biochemistry at St Mary's Hospital to Charing Cross Hospital on a regular basis during the way. Specimens for analysis should be sent to the Clinical Biochemistry laboratory via the specimen porter or via the pneumatic tube system during these hours.

Charing Cross Hospital (Monday to Friday 0800-1700)

Specimens will be collected from ward areas during routine specimen porter ward rounds or should be sent to the Microbiology Laboratory via the pneumatic tube system (station 900).

Chelsea & Westminster Hospital (Monday to Friday 0800-1700)

Specimens will be collected from ward areas during routine specimen porter ward rounds or should be sent to the central specimen reception area via the pneumatic tube system.

Hammersmith Hospital (Monday to Friday 0900-1700)

Specimens should be sent to Pathology Reception Ground Floor G block via the pneumatic tube system or collected from ward areas during the routine specimen porter ward rounds. Samples are transported to Microbiology at Charing Cross Hospital at hourly intervals.

REQUESTS FOR URGENT INVESTIGATIONS UP TO 17.00

St Mary's Hospital

- Specimens will be transported from Clinical Biochemistry at St Mary's Hospital to Charing Cross Hospital on anregular basis. Specimens for analysis should be sent to the Clinical Biochemistry laboratory via the specimen porter or via the pneumatic tube system during these hours.

Charing Cross Hospital

- Telephone the Pathology Specimen portersext: 17083 who will collect the specimen and dispatch it to Microbiology.
- Contact the laboratory on ext: 17835 to inform them of the urgent specimen being sent.

Chelsea & Westminster Hospital

- Bleep the Pathology Specimen porters (bleep 0252 or bleep 0173) who will collect the specimen and dispatch ittoMicrobiology at Charing Cross.
- Contact the laboratory on ext: 17835 to inform them of the urgent specimen being sent.

Hammersmith Hospital

- Specimens are transported from Pathology Reception (Ground Floor G Block) to Microbiology at Charing Cross Hospital
- Contact the laboratory on ext. 17835 to inform them of the urgent sample being sent.

WEEKEND TRANSPORT SERVICE

St Mary's Hospital (Saturday and Sunday)

Routine

- On Saturday and Sunday there will be five collections from the Biochemistry laboratory in the Mint Wing at 0830, 1130,1800 and 2300.

Urgent

- See out of hours service below for urgent specimens.

Charing Cross Hospital (Saturday and Sunday)

Routine

- Send samples to specimen reception, 1st floor laboratory block.

Urgent

- Contact the laboratory on **ext: 17835** OR Bleep the microbiology on call scientist, on **bleep 0248**, to inform them of the urgent sample being sent.
- Use pneumatic tube system to station 900 or take to specimen reception on the 1st floor laboratory block

Chelsea and Westminster Hospital (Saturday and Sunday)

Routine

- There will be scheduled collections at 0900, 1200, 17.00 and 2200 from Pathology C&W to Charing Cross Hospital.

Urgent

- Call the C&W pathology porters on x. 36804 to arrange collection of the sample. State that it is an urgent sample.
- C&W pathology porters will collect the sample and take it to Pathology.
- Pathology Specimen Reception staff will arrange for the urgent courier to transport the sample to Microbiology at Charing Cross
- Contact the laboratory on **ext: 17835** OR Bleep the microbiology on call scientist, on **bleep 0248**, to inform them of the urgent sample being sent.

Hammersmith Hospital (Saturday and Sunday)

Routine

- There will be scheduled collections at 0800, 1100, 1730 and 2230 from Pathology Reception HH to Charing Cross Hospital

Urgent

- Contact the duty porters via **ext: 34559 or Bleep 9257**. They will collect the sample and dispatch it to Microbiology at Charing Cross.
- Contact the laboratory on **ext: 17835** OR Bleep the microbiology on call scientist, on **bleep 0248**, to inform them of the urgent sample being sent.

18.00 – 20.00 AND OUT-OF-HOURS TRANSPORT SERVICE

Requests should be limited to those *necessary for immediate patient management*. The medical officer should discuss the request with the duty BMS who can be contacted via bleep. Samples marked urgent but which have not been telephoned will not be processed. If there is doubt about the need for an urgent test, the BMS is instructed to refer the request to the on call doctor. *The on call BMS will not deal with requests to look up results, please use the Cerner system***.**

Non-urgent, out of hours specimens may be refrigerated overnight, with the exception of blood cultures, which should be sent immediately to the microbiology department for incubation at 37℃.Whenever possible, take pre-operative swabs (e.g. eye swabs before cataract removal) at least 48 hours and preferably 72 hours before results are required.

St Mary's Hospital (Monday to Friday 17.00 to 0900)

Routine

- Specimens will be transported from the porters' lodge (Ground Floor QEQM) at 0830, 1730, 1830 and 2330 to the Charing Cross site.

Urgent

- Ward staff must send urgent samples to Clinical Chemistry Specimen Reception, 2nd Floor, Mint Wing – bleep 1022; by porter or via the pod.
- Ward staff must inform Clinical Chemistry Specimen Reception staff or the porter that sample requires urgent courier.
- Clinical Chemistry Specimen Reception staff will arrange adhoc courier for the sample on the instruction of the ward staff/porter.
- Contact the on call scientist on **bleep 0248**to inform them of the urgent sample being sent.

Charing Cross Hospital (Monday to Friday 1700 to 0800)

Routine

- Send samples to specimen reception, 1st floor laboratory block.

Urgent

- Contact the laboratory on **ext: 17815** OR Bleep the microbiology on call scientist, on **bleep 0248**, to inform them of the urgent sample being sent.
- Use pneumatic tube system to station 900 or take to specimen reception on the 1st floor laboratory block

Chelsea and Westminster Hospital (Monday to Friday 1700 to 0900)

Routine

- There will be two scheduled collections at 1800 and 2200 to transport microbiology specimens from Pathology at C&W to the Charing Cross site.

Urgent

- Call the C&W pathology porters on x. 36804 to arrange collection of the sample. State that it is an urgent sample.
  - C&W pathology porters will collect the sample and take it to Pathology.
  - Pathology Specimen Reception staff will arrange for the urgent courier to transport the sample to Microbiology at Charing Cross. (This was formerly done by ward staff but no longer.)
  - Contact the laboratory on **ext: 17835** OR Bleep the microbiology on call scientist, on **bleep 0248**, to inform them of the urgent sample being sent.

Hammersmith Hospital (Monday to Friday 1700 to 0900)

Routine

- There will be two scheduled collections at 1800 and 2200 to transport microbiology specimens from Pathology Reception at HH to the Charing Cross site.

Urgent

- Bleep the microbiology on call scientist, on **bleep 0248**,
- Contact the porters as normal via **ext: 34559 or bleep 9257**. They will collect the sample and dispatch it to Microbiology at Charing Cross

MICROBIOLOGY REPERTOIRE, SAMPLE REQUIREMENTS AND TURNAROUND TIMES

For Microbiology Serology test information see under Department of Infection & Immunity.

Investigation	Samples tested	Container & Sample volume	Turnaround time	Additional transport requirements and other comments	
For additional information on test background and clinical indications, please also refer to the test repertoire on the Pathology website on http://nwlpathology.nhs.uk/					
Unless otherwise stated, samples should be sent to the laboratory on the day of collection or refrigerated overnight					
Turnaround times are in working days and will be extended if further referral to a reference centre is required. Additional referral laboratory turnaround times may vary from 5 – 15 days according to the isolate and referral work required. Turnaround times may also be extended if additional work is required on complex cultures.					
Acanthamoeba culture	Corneal scrape	Culture medium obtained from laboratory by prearrangement with microbiology.	3 days	Transport pre-inoculated culture medium in a sealed-plastic bag, and the slide prepared by the clinician in a plastic slide container	Positive cultures are sent to the London School of Hygiene and Tropical Medicine for confirmation
Amikacin Assay	Performed by Clinical Biochemistry laboratory. Refer to website here				
Ascitic fluid cell count, microscopy and culture	Ascitic fluid	Cell count: approx. 3 mL fluid in EDTA (lavender top)• Microscopy and culture: sterile universal container (2 mL)	3 days	Transport to the laboratory on the day of collection	Reference Range Cell count : <250 WBCs/µL
Blood culture	Aseptically-collected venous blood samples	Adult set: 5-10 mL/bottle BACTEC® FX (aerobic and anaerobic bottles) -Paediatric set: 2-5 mL in single BACTEC FX paediatric bottle	6 days for routine cultures• 14 days for extended cultures if clinically indicated (eg. ?Brucellosis)	Transport to the laboratory on the day of collection or store overnight at room temperature	Positives phoned. Daily culture updates reported electronically.

Investigation	Samples tested	Container & Sample volume	Turnaround time	Additional transport requirements and other comments
Bone marrow biopsy and/or aspirate	Aseptically collected bone marrow sample	Sterile universal container for specific tests, such as *Leishmania* microscopy, culture and PCR. -Blood culture bottle for routine bacteriological investigations	1-2 weeks	Transport to the laboratory on the day of collection or store overnight at room temperature.
Bordetella culture	Nasopharyngeal swab, Nasopharyngeal aspirate (NPA), Pernasal swab	Amies transport medium containing charcoal for both nasopharyngeal and pernasal samples. --Sterile universal container for NPA samples with a minimum volume of 1 mL	7-10 days	Transport to the laboratory on the day of collection or store overnight at room temperature
Cerebrospinal fluid (CSF) cell count, microscopy and culture	CSF	Preferably three sequentially labelled sterile universal containers ≥1 mL	3 days	Transport to the laboratory as soon as possible, after informing laboratory personnel
Chlamydia trachomatis (CT) NAAT	First-catch urine• Genital swabs (urethral, cervical, vulvo-vaginal and rectal) • Extra-genital swabs (throat or conjunctival)	Urine in sterile universal container-BD ProbTec™ sample collection kit (male/female). Click here for instructions on self collection of vaginal swabs	5 days	Transport to the laboratory on the day of collection or store overnight at room temperature (See also Combined CT / Neisseria gonorrhoeae (GC) NAAT)

Investigation	Samples tested	Container & Sample volume	Turnaround time	Additional transport requirements and other comments
Combined CT / Neisseria gonorrhoeae (GC) NAAT (See also Chlamydia trachomatis (CT) NAAT	First-catch urine• Genital swabs (urethral, cervical, vulvo-vaginal and rectal) • Extra-genital swabs (throat or conjunctival)	Urine in sterile universal container-BD ProbTec™ sample collection kit (male/female). Click here for instructions on self collection of vaginal swabs	5 days	Transport to the laboratory on the day of collection or store overnight at room temperature **Note**: The laboratory is not UKAS accredited for the secondary test performed on positive Neisseria gonorrhoeae (GC) NAAT screening tests. See here for further information
Chlamydia trachomatisLymphogranulomavenereum (LGV) PCR	Sample sent for Chlamydia/gonorrhoea NAAT positive for C.trachomatis	BD Qx SDA collection kit	1 week	Other sample sites (e.g. urine, throat) may be accepted; please contact the laboratory if required.
Clostridium difficile	Faeces	5 - 10 mls in Sterile universal container	24 hours	Plus 14 days for ribotyping
Contact Lens Culture	Contact lens or fluid	Contact lens container	7 days	
Corneal Scrape Culture	Corneal scrape material	Culture Plates	5 days	Only available for samples sent from the Western Eye Hospital
Corneal Scrape Microscopy	Corneal scrape material	Slide	1 day	
Cross infection screen	Swabs, urine	Swabs in Amies transport medium	3 days	To screen for the following organisms: • multi-drug resistant coliforms • multi-drug resistant Acinetobacter baumanni • vancomycin-resistant enterococci (VRE) *Note: Due to a recent change in the method used to detect carbapenemase-producing Enterobacteriaceae, the laboratory is not currently accredited for this test.*
Cryptococcal antigen test	Serum, CSF	Rust Top Vacutainer, sterile universal container for CSF	1 day	

Investigation	Samples tested	Container & Sample volume	Turnaround time	Additional transport requirements and other comments	
Ear, nose, throat (ENT) culture	Swabs from ear, nose, throat or pharyngeal, mouth, tongue	Amies transport medium	3 days		
Exit site swab culture	Exit site swabs	Amies transport medium	3 days		
Eye or conjunctival culture	Eye , conjunctival swab	Amies transport medium	3 days		
Faecal cryptosporidia microscopy	Faeces	5 - 10 ml in Sterile universal container	3 days		
Faecal culture	Faeces	5 - 10 ml in Sterile universal container. See link for instructions to patients on collecting a faeces sample.	2 - 4 days	Samples may be referred to Public Health England for further investigation in which case TAT will be extended up to an additional 25 days	
Faecal ova, cyst and parasite	Faeces, Whole parasite or segments, Sellotape® slide for pinworm investigation	5 - 10 ml in Sterile universal container	3 days	For invasive amoebiasis, a fresh 'hot' sample should be transported to the laboratory as soon as possible.	Samples may be referred to the Hospital for Tropical Diseases and the London School of Hygiene and Tropical Medicine for further investigation
Faeces Rotavirus, Adenovirus, Norovirus	Faeces	1 – 2 ml (min 0.5ml) in Sterile Universal container	3 days	See also Norovirus	

Investigation	Samples tested	Container & Sample volume	Turnaround time	Additional transport requirements and other comments	
Fluid culture (Non-sterile body fluids)	Drain fluid / collection	Sterile Universal container	5 days		
Fluid microscopy and culture (Sterile body fluids)	Bile, synovial (joint) fluid, pericardial fluid, peritoneal fluid, pleural fluid	Sterile Universal. Always submit as much fluid as possible; never submit swab dipped in fluid.	5 days		
Fungal Dermatophyte microscopy and culture	Skin scrapings, Hair (plucked with follicles), Nail clippings	Dermapak™, Mycotrans™ and/or sterile universal container	4-5 weeks	Transport to the laboratory within 2-3 days of collection. Store at room temperature in dry conditions	For skin scrapings and nail clippings disinfect the affected area with alcohol and collect sufficient amount. For hair samples, include at least 10 infected hair strands
Fungal long-term culture	Tissue and/or biopsy samples, Bone marrow aspirate	Sterile universal container	4-5 weeks	Transport to the laboratory on the day of collection or store overnight at room temperature	
Fungal short-term culture	Respiratory samples (including sputum, bronchoalveolar lavage, bronchial washing, etc.), Sterile fluids (including pleural fluid), Swabs (including ENT, oral, genital, etc.)	• Swabs in Amies transport medium • Other samples in sterile universal container	2 weeks	Transport to the laboratory on the day of collection or store overnight at room temperature	
Gentamicin Assay	Performed by Clinical Biochemistry laboratory. Refer to website here				

Investigation	Samples tested	Container & Sample volume	Turnaround time	Additional transport requirements and other comments	
GUM sexual health screen	Genital swabs (urethral, cervical, vulvo-vaginal), Extra-genital swabs (rectal and throat), Sup-prepuce swabs are occasionally submitted for candidiasis/balanitis in men	Pre-inoculated culture media for the microorganisms above are inoculated at sexual health clinics and incubated at 35-37℃ at 5 % CO_2.	3 days	Transport to the laboratory on the day of collection	. Samples may be referred to the Sexually Transmitted Bacteria Reference Laboratory, Public Health England, for further investigation
Genital swabs (female)	Cervical and endocervical swabs, High vaginal swabs (HVS), Low vaginal swabs (LVS), Labial or vulval swabs	Amies transport medium containing charcoal for cervical and endocervical swabs, Amies transport medium for all other sites	3 days	Transport to the laboratory on the day of collection or store overnight at room temperature	
Helicobacter culture	Gastric or deodenal biopsy	Sterile universal container	7-10 days	Samples may be referred to Public Health England for further investigation	
Helicobacter pylori antigen test	Faeces	5 - 10 ml in Sterile universal container	3 days		
HIV (rapid testing out of hours)	Serum	5 ml GEL SST (Rust Top)	1 day	Only available out of hours and by arrangement with the Microbiology medical staff. In hours, urgent HIV testing is performed by the I&I laboratory and must be arranged with them in advance.	All samples are forwarded to the Infection & Immunity laboratory for confirmation of results.
Intravascular catheter (line tip) culture	5 cm distal tip	Sterile universal container	3 days		
IUCD culture	IUC device	Sterile universal container	7-10 days	Transport to the laboratory on the day of collection	

Investigation	Samples tested	Container & Sample volume	Turnaround time	Additional transport requirements and other comments	
Legionella culture	Respiratory samples (sputum, BAL, BW, TA), Sputum samples (expectorated or induced)	2 mls in Sterile universal container (**not** sputum trap container)	7-10 days	Please request separately. Not included in standard respiratory culture testing	Samples may be referred to the Atypical Pneumonia Unit, Public Health England, for further investigation
Legionella urinary antigen	Urine	5 mL in Sterile universal container	24 hrs	Samples may be referred to Public Health England for further investigation	
Lymphogranulomavenereum (LGV) PCR	Sample sent for Chlamydia/gonorrhoea NAAT positive for C.trachomatis	BD Qx SDA collection kit	1 week	Other sample sites (e.g. urine, throat) may be accepted; please contact the laboratory if required. (See also Chlamydia trachomatis information	
Microsporidia PCR	Faecal sample or other relevant sample (mainly tissue biopsy) depending on clinical presentations	5 - 10 ml in Sterile universal container	7-14 days	Not currently performed in house; this test is referred to the Hospital for Tropical Diseases	
MRSA screen	Nose or nose/axilla/groin swabs	Amies transport medium	2 days		
Mycoplasma and/or Ureaplasma culture	High vaginal sample (female), Urethral swab or semen (male)	2 mls in Sterile universal container	5 days	Transport to the laboratory on the day of collection or store overnight at room temperature	Please request separately. Not included in standard genital culture testing

Investigation	Samples tested	Container & Sample volume	Turnaround time	Additional transport requirements and other comments	
Nasopharyngeal aspirate (NPA) culture	NPA fluid	> 2 mls in Sterile universal container	3 days	Samples should be sent to Virology if viral infections are suspected. If bacterial infection is suspected, routine culture for bacteria and fungi can be performed.	
Neonatal screen	Swab from neonate's ear post delivery, Swabs from umbilical, nose, groin areas if clinically relevant	Amies transport medium	3 days		
Norovirus	Faeces	1 – 2 ml (min 0.5ml) in Sterile Universal container	3 days		
Penile swab culture	Penile swab	Amies transport medium	3 days	Transport to the laboratory on the day of collection or store overnight at room temperature	
Peri-anal and/or perineal swabs culture	Swab	Amies transport medium	(Up to) 5 days		
Peritoneal dialysis fluid (PDF) cell count, microscopy and culture	PDF	Two to three sterile universal containers each containing approx. 20 mL of fluid	7 days	Transport to the laboratory on the day of collection	Cell count: <100 WBCs/µL
Pleural Fluid	Bile, synovial (joint) fluid, pericardial fluid, peritoneal fluid, pleural fluid	Sterile Universal. Always submit as much fluid as possible; never submit swab dipped in fluid.	5 days		
Pneumococcal Antigen	Urine	5 mL in Sterile universal container	24 hrs		

Investigation	Samples tested	Container & Sample volume	Turnaround time	Additional transport requirements and other comments	
Pneumocystis (PCP) immunofluorescence (IF)	Induced sputum, Bronchoalveolar lavage, Bronchial washing	2 mls in Sterile universal container	2 days	**Note:** The laboratory is not UKAS accredited for this test.	See here for further information
Pus and/or abscess culture	Aseptically collected pus and/or abscess aspirate/drain	≥1 mL in Sterile universal container	(Up to) 7 days		
Rapid Antigen Screen	Serum	5 ml GEL SST (Rust Top)	1 day	**Note:** The laboratory is not UKAS accredited for this test.	See here for further information
Rectal swab culture (other than GUM samples)	Swab	Amies transport medium	3 days		
Respiratory tract culture	Bronchial/tracheal fluid	2 mls Sterile universal container (**not** sputum trap container)	3 days		
Rotavirus, Adenovirus	Faeces	1 – 2 ml (min 0.5ml) in Sterile Universal container	3 days	See also Norovirus	
Semen culture	Semen sample	2 mls Sterile universal container	3 days for routine culture, 5-7 days if Mycoplasma and/or Ureaplasma cultures are requested	Transport to the laboratory on the day of collection or store overnight at room temperature	Patient preparation: external genitalia should be washed with soap and water before sample collection.

Investigation	Samples tested	Container & Sample volume	Turnaround time	Additional transport requirements and other comments	
Sexual health (GUM) screen	• Genital swabs (urethral, cervical, vulvo-vaginal) • Extra-genital swabs (rectal and throat) • Sup-prepuce swabs are occasionally submitted for candidiasis/balanitis in men	Pre-inoculated culture media for the microorganisms above are inoculated at sexual health clinics and incubated at 35-37℃ at 5 % CO_2	3 days	Transport to the laboratory on the day of collection.	Samples may be referred to the Sexually Transmitted Bacteria Reference Laboratory, Public Health England, for further investigation.
Sputum culture	Expectorated or induced sputum samples	2 mls in Sterile universal container (**not** sputum trap container)	3 days	Transport to the laboratory on the day of collection or store overnight at room temperature	
Sterility culture	Milk bank samples, Cell culture medium	Sterile universal container	(Up to) 14 days		
TB and mycobacterial culture	Respiratory samples (sputum, bronchoalveolar lavage, bronchial washing, tracheal aspirate)• Tissue samples and biopsies including lymph node• Aspirates including fine needle aspirate and gastric washings• Fluids (pleural, ascetic, pericardial, etc.)• Pus samples• Early morning urine (EMU) samples	Sterile universal container. Three consecutive EMU samples are required for culture. Minimum volume for each sample is approx. 100 mL.	6-8 weeks	Samples may be referred to the *Mycobacteria* Reference Unit, Public Health England, for further investigation.	

Investigation	Samples tested	Container & Sample volume	Turnaround time	Additional transport requirements and other comments	
TB blood culture	Blood and bone marrow samples	Specific TB culture bottles obtained from Pathology Reception	6-8 weeks		
TB PCR (Mycobacterium tuberculosis complex) PLUS Rifampicin resistance gene detection	CSF and/or respiratory samples	≥1 mL in Sterile universal container (min. 2mls for BAL samples)	4 days	Transport to the laboratory on the day of collection or store overnight at room temperature. This test is only performed with prior agreement with a Consultant Microbiologist.	**Note**: The laboratory is not UKAS accredited for this test for sample types CSF and tissue. See here for further information
Tip culture (other than intravascular)	The distal end section of catheter	Sterile universal container	3 days		
Tissue and/or biopsy culture	Tissue (including bone) and/or biopsy samples in sterile universal container, Fine needle aspirates in sterile universal container	Sterile universal container	7-10 days	Samples may be referred to the *Mycobacteria* Reference Unit, Public Health England, for further investigation.	
Tobramycin Assay	Now referred externally to Bristol antimicrobial Reference laboratory. Sample referral and reporting managed by Infection & Immunity laboratory. Refer to website here				
Tracheostomy swab culture	Swab	Amies transport medium	3 days		
Urethral swabs (other than GUM samples)	Urethral swab	Amies transport medium containing charcoal	3 days	Transport to the laboratory on the day of collection or store overnight at room temperature	
Urine microscopy and culture	Mid-stream clean-catch urine	Sterile universal container	2 days	Click here for instructions to patients on how to collect a urine sample *Due to a recent change in analytical platform, the microscopy result is not currently UKAS accredited.*	

Investigation	Samples tested	Container & Sample volume	Turnaround time	Additional transport requirements and other comments	
Urine Schistosoma microscopy	Terminal catch of early morning urine	Sterile universal container	2 days		
Vaginal culture	Cervical and endocervical swabs, High vaginal swabs (HVS), Low vaginal swabs (LVS), Labial or vulval swabs	Amies transport medium containing charcoal for cervical and endocervical swabs, Amies transport medium for all other sites	3 days	Transport to the laboratory on the day of collection or store overnight at room temperature	
Vancomycin Assay	Performed by Clinical Biochemistry laboratory. Refer to website here				
Wound and ulcer culture	Wound, Ulcer, Umbilical swabs	Amies transport medium	3 days	See statement at beginning of test table on extended turnaround times if referred	

Reference Laboratory Details:

At times, it may be necessary to refer work to other laboratories or consultants. The department routinely sends work to the following organisations:

Reference Laboratory	Test referred
Micropathology Ltd University of Warwick Science park Venture Centre Sir William Lyons Road Coventry CV4 7EZ	16S or 18S Ribosomal PCR Whipples PCR
Anaerobic reference laboratory NPHSMicrobiology, Cardiff UniversityHospital of Wales, HeathPark Cardiff CF14 4XW	Identification of Anaerobic bacteria and *Actinomyces*
Hospital for Tropical Diseases (HTD) Department of Clinical Parasitology 3 rd floor Mortimer Market Tottenham Court Road London WC1E 6DG	Intestinal parasites identification *Acanthamoeba* identification Microsporidia PCR
Antimicrobial Resistance and Healthcare Associated Infections (AMRHAI) PHE, 61 Colindale Avenue, London, NW9 5HT	Serological Typing PVL toxin gene detection Extended toxin gene detection Genomovar determination MIC evaluation ESBL detection Carbapenem resistance Acquired AmpC *mecA*PCR *mupA*PCR Linezolid resistance Identificatiobn
Rare and Imported Pathogens Laboratory Manor Road Porton Salisbury Wiltshire SP4 0JG	Identification of Anthrax
Respiratory and vaccine preventable bacteria reference unit (RVPBRU) PHE, 61 Colindale Avenue, London, NW9 5HT	*Bordetella* culture, identification, PCR Respiratory Chlamydia PCR *Legionella* culture, confirmation and typing and urine antigen detection *Mycoplasma* and *Ureaplasma* culture and identification *Haemophilus* identification and typing Epidemiological typing of streptococci Identification of *Streptococcus*sp and related genera Identification and toxigenecity testing of *Corynebacteriumdiphtheriae*
Animal and Plant Health Agency New Haw, Addlestone Surrey KT15 3NB	Identification of *Brucella* sp.
Laboratory of Gastrointestinal Pathogens PHE, 61 Colindale Avenue, London, NW9 5HT	*Campylobacter* identification, molecular typing and susceptibility testing *Salmonella, Shigella, Vibrio, Yersinia* and *E. coli* (including serotype O:157) identification and typing *Helicobacter* identification and susceptibility testing *Bacillus* sp., *C. botulinum*, *C. perfringens*, *C. tetani*, *Listeria* sp. and *S. aureus* toxin/gene detection, isolation, identification and typing

Meningococcal Reference Laboratory PO BOX 209 Manchester Royal Infirmary Clinical Science Building Oxford Road Manchester M13 9WZ	Meningococcal identification, characterisation, sensitivity testing and PCR Pneumococcal PCR and pre-post vaccine serology
National Mycobacterium Reference LaboratoryPHE, National Mycobacterium Reference Service-South, National Infection Service, 61 Colindale Avenue, London, NW9 5HT	Mycobacterial culture, identification and sensitivities
Mycology Reference Laboratory (PHE) Bristol Royal Infirmary Myrtle Road, Kingsdown Bristol BS2 8EL	Fungal identification and sensitivity testing
Cryptosporidium Reference Unit Public Health Wales Microbiology ABM Singleton Hospital Swansea SA2 8QA	Cryptosporidium
Diagnostic Parasitology Lab Faculty of Infectious & Tropical Medicine, London School of Hygiene& Tropical Medicine, Keppel St, London WC1E 7HT	Parasite for Identification

Please refer to the UKAS website http://www.ukas.com/search-accredited-organisations/for UKAS accredited laboratories and clinical-pathology-accreditation for those currently transitioning from CPA accreditation.

ANTIBIOTIC ASSAYS

Assays for Vancomycin, Amikacin and Gentamicin are carried out in Clinical Biochemistry. Clinical support is provided by Microbiology consultants. Please refer to the Pathology Website for information on test requirements.
Trough Level – Take blood immediately before the dose.
Other assays are not performed routinely. These must be discussed with a member of the medical microbiology staff and, if required, may necessitate considerable forward planning. These are referred by the Infection & Immunity laboratory.

Tobramycin assays, previously performed by Biochemistry, are now referred externally to Bristol Antimicrobial Reference laboratory. Sample referral and reporting is managed by the Infection & Immunity laboratory.

TUBERCULOSIS

If you require urgent microscopy, please contact the laboratory on ext 17828. Positive microscopy and culture results are telephoned to the doctor whose name appears on the request and written reports are sent to the ward or department indicated on the request and also to the consultant.

Cultures are incubated for up to 6 weeks before being reported as negative.