NHS
North West
London Pathology

# NWL Pathology User Guide

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| AUTHORISED BY | Angela Jean-Francois |
| AUTHOR | Helen Hobson |
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*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)?**
North West London Pathology is a NHS Pathology Partnership owned by Imperial College Healthcare NHS Trust, Chelsea and Westminster NHS Foundation Trust and The Hillingdon Hospital NHS Foundation Trust. North West London Pathology is hosted by Imperial College Healthcare NHS Trust (this takes the ICH legal form). The partnership 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.

The transition of services from previous owner Trusts to North West London Pathology has included the harmonisation of services and implementation of new equipment and IT systems.

**NWL Pathology User Guide**
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 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, Chelsea and Westminster hospital and the Clinical biochemistry services provided from the Hillingdon and West Middlesex University Hospital laboratories:

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

Haematology & Blood Transfusion Services provided from the Hillingdon and West Middlesex University Hospital laboratories are not yet accredited.

## PATHOLOGY SUPPORT SERVICES

The Pathology Support Services Division manages the Pathology call centre, including the Pathology IT helpdesk, GP supplies, Specimen Reception departments on all sites, the referral of specimens to external laboratories and specimen transport.

Locations:
The NWL Pathology Call Centre are located at Charing Cross Hospital, on the 2nd Floor of the Laboratory Block, Charing Cross Hospital. The Central Referral team are located within the 1st floor Multidisciplinary Automated Laboratory (MDAL) at Charing Cross Hospital.

Service:
Pathology Support Services at Charing Cross Hospital provides 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 Pathology users for pathology enquiries.

Pathology results:
The Pathology Call Centre at Charing Cross has dedicated phone lines which provide pathology results for all Pathology laboratories across NWLP. 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.

## PATHOLOGY IT

The IT offices at Charing Cross Hospital are responsible for the Laboratory Information Management System and associated interfaces for North West London 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

Additionally the business analytics support is provided from St Mary's hospital mint wing.

## KEY PATHOLOGY PERSONNEL / CONTACT NUMBERS:

| | |
|---|---|
| Pathology Enquiries/Results | 020 331 35353/5386 |
| Pathology IT enquiries | 020 331 17600 |
| Saghar Missaghian-Cully, Managing Director, NWL Pathology | 020 331 21674 |
| Angela Jean-Francois, Director of Operations, NWL Pathology | 020 331 26494 |
| Allen Widdowson, Director of Finance, NWL Pathology | 020 331 25559 |
| Matthew Connell, Director of Data, Digital and IT | 020 331 15246 |
| Rachel Tunstall, Blood Sciences General Manager | 07766801492 |
| Mike Lyall, Deputy Divisional Manager Blood Sciences | 0203 31 15142 |
| Sreekanth Talluri, Deputy Divisional manager Blood Sciences | 0203 31 21039 |
| Panos Pantelidis, Divisional Manager I&I Sciences | 0203 31 10230 |
| Monica Rebec, Deputy Divisional Manager I&I Sciences | 020 331 15198 |
| Danya Cohen, Divisional Manager Cellular Pathology | 020 331 15196 |
| Sarah Horton, Deputy Divisional Manager Cellular Pathology | 020 331 15118 |

| | |
|---|---|
| Soma Pillay, Cancer Services Manager Cellular Pathology | 020 331 35902 |
| Helen Hobson, NWL Pathology Quality & Governance Manager | 020 331 17846 |
| Edwin Turner, Pathology IT Operations Manager | 020 331 21290 |
| Gareth John, NWLP Point of Care Testing Manager | 020 331 17077 |
| Rupinder Gill, Head of GP Liaison & Pathology support Services | 07917 059 8563 |
| Claire Kennedy, Communications Manager | 020 331 26261 |

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 7846 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, Data Protection, Confidentiality and Information Sharing Policy. 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 Sonia De Castro, Business Support Coordinator on 020 331 26140 or email at sonia.decastro@nhs.net.

CONTRACTS

If you are interested in establishing a contract with or have a query regarding contracts, please contact Uscher Devkota, NWLP Contracts manager, via email at u.devkota@nhs.net copying Sonia De Castro (as above).

| CLINICAL GOVERNANCE: | | Ext. |
|---|---|---|
| NWL Pathology Quality & Governance manager | Helen Hobson | 17846 |
| Clinical Director | Dr Corrina Wright | 10279 |

Department Quality & Governance Managers:

| | | |
|---|---|---|
| Cellular Pathology | Michael Donovan | 15171 |
| Clinical Biochemistry | Amal Bashir | 15170 |
| Haematology & Blood Transfusion | Gillian Lynam | 15171 |
| Infection & Immunity Sciences | Nicola Mandikate | 15175/10143 |
| Point of Care Testing | Gareth John | 21343 |
| IT Quality / Health & Safety Manager | Florence Ejiofor | 15174 |

1

## 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 |
| | THH | 01895 279 293 | 01895 279033 | 5627 |
| | WMUH | 02083215515 | 02083216947 | 0208 560 2121blp 238 |
| **Cellular Pathology** | | | | |
| Histology | CXH | 17132/17139 | 17131/30560 | N/A |
| Electron Microscopy | CXH | 17147 | 17147 | N/A |
| Molecular | HH | 32179 | 32179 | N/A |
| Cytogenetics | HH | 32169 | 32179 | N/A |
| Immunophenotyping | HH | 31505 | 32179 | N/A |
| | | | | |
| **Clinical Biochemistry** | CXH | 35353 | 17062/35924 | 8161 |
| | C&W | 35353 | 58094 | 0143 |
| | HH | 35353 | 32109 | 9022 |
| | SMH | 21309 | 21039 | 1022 |
| | THH | 01895 279 292 | 01895279288 | 5602 |
| | WMUH | 0208 321 5930 | 0208 321 5928 | 0208 560 2121blp 175 |
| Andrology | HH | 34680 | 34682 | - |
| | | | | |
| **Haematology** | CXH | 30520 | 17116 | 8160 |
| | C&W | 55206 | 58213 | 0360 |
| | HH | 32453 | 33293 | 9079 |
| | SMH | 21130 | 21039 | 1611 |
| | THH | 01895 279 292 | 01895 238282 Ext 2237 | 5627 |
| | WMUH | 0208 321 5991 | 0208 321 5928 | 0208 560 2121blp 238 |
| | | | | |
| **Infection & Immunity Science** | | | | |
| 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 | 17077 (Mob:07342 062 382) | 21343 | 8161 |
| | C&W | 55135 (bleep 0143) | 21343 | 0143 |
| | HH | 32446 (bleep 9606) | 21343 | 9022 |
| | SMH | 21320 (bleep 1021) | 21343 | 1022 |
| | THH | 01895 279209 | 21343 | 5602 |
| | WMUH | 0208 321 5930 | 21343 | 337 |
| Virology-related POCT (e.g. POCT HIV, RSV etc.) | CXH | 10173 | 21343 | N/A |

FOR ALL RESULTS (MONDAY – FRIDAY 9am to 5pm)

PLEASE CALL: Pathology Call Centre on 020 331 35353
Or
Email: ICHC-tr.ImperialPathologyResults@nhs.net

# 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.

Cerner and Sunquest ICE are the Hospital order communications system (OCS) in use at Imperial, Chelsea (Cerner) and Hillingdon (ICE) Trusts. The OCS provides labels for containers, except for Blood Transfusion requests which must still be hand-written. It is essential to carefully note that the container printed on the label matches the container type and the patient name on the label is correct. For Cerner 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 Imperial ICT helpdesk on 5555, CW ICT helpdesk on 8888 or Hillingdon ICT helpdesk on 4400 to report printer faults urgently). Specimens labelled with printed labels where the patient identifiers are not clear and legible may be rejected.

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 applicable 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, donor ID number for H&I deceased donor cross match samples.
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 laboratory number)

**All samples, in addition to the above identifiers, should be labelled with the sample collection date and time, and signature of phlebotomist.**

**Blood Transfusion Samples Date of Collection: It is desirable the time of collection is written on sample. Samples not received within 24 hours of collection will not be processed for Group and Screens.**

**The Blood Transfusion laboratory will NOT accept samples that do not include these additional labelling requirements.**

Samples labelled with a Cerner label (not Blood Transfusion samples) should be labelled using a sample label printed at time of the sample being collected and NOT PREVIOUSLY printed/provided, this is to ensure that the dates match the sample collection date).

Staff should check that the Cerner or GP system label has printed correctly with the relevant patient details clearly identifiable. The labels should be correctly aligned.

Samples must be sent to the laboratory in one bag per patient sample. This is required to enable the work flow and to reduce booking errors in the laboratory. It has also been noted that when a mixture of patients' samples are received in a single bag it is often later detected that these specimens have been mislabelled.

Where samples are received for multiple patients in one bag, samples will be processed however Pathology staff will raise a Datix incident against the clinical area to ensure an investigation into why this has occurred is carried out.
Samples may be rejected if sample mislabelling is suspected following analysis.

**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.

**Specimen acceptance criteria**
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 only OCS labels (with no form). See the Trust Positive Patient Identification policy for further details. If the laboratory suspects a sample has been mislabelled the sample will be rejected and results cancelled. Additionally 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 SIHMDS samples a referral note to include all relevant clinical information must be sent, along with the SIHMDS 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 and Chelsea & Westminster Hospital sites pathology requests are made electronically via Cerner Order Communications Systems (OCS). Cerner OCS systems are supported by the respective NHS Trust and Trust 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 established the Diagnostic cloud which allows GPs to access all patient results for both Radiology and Pathology wherever they are processed in North West London. The Diagnostic Cloud is available to reduce 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.

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 PAT-MP-015-NWL Transportation of Pathology Specimens for information regarding Transport across Imperial Pathology sites.

There are routine locally arranged specimen collection rounds for wards and departments within all customer hospitals. 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
11. CSF spectrophotometry samples should be delivered to the lab by hand and protected from the light as transport by pod (PTS) may cause degradation and affect the result.

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 and the urgent sample log is completed.

Specimens from GP practices are either collected by Pathology couriers or posted to the laboratory directly.

All Gynaecological cytology samples need to be placed inside the transport bag for CSL. No cervical screening is performed at NWLP. All queries regarding cervical screening need to be directed to CSL.

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, West Middlesex, Hillingdon and Hammersmith Hospitals.

## 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 | 17:00-0900 |
| | Haematology/Transfusion | Bleep 1611 | 17:00-0900 |
| Hillingdon | Clinical Biochemistry | Bleep 5602 | 17:30-0900 |
| | Haematology/Transfusion | Bleep 5627 | 17:30-0900 |
| West Middlesex | Clinical Biochemistry | Bleep 175 | 17:30-0900 |
| | Haematology/Transfusion | Bleep 238 | 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 Haemorrhagic 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 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 Intranet: Cerner downtime procedures. 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 or via email at: ICHC-tr.ImperialPathologyResults@nhs.net 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 HOSPITALS NHS FOUNDATION TRUST

For Ordering Pathology tests

For planned downtime, messages are sent out by email and daily notice board 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 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.

## THE HILLINGDON HOSPITALS NHS FOUNDATION TRUST

For Ordering Pathology tests

For planned downtime, messages are sent out by email and daily notice board 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 4400 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 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 Pathology Specimen Reception and on clinical wards. 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

## LOCATIONS

The Cellular Pathology Departments incorporate Cytopathology, Histopathology, Electron Microscopy, and Specialised Integrated Haematological Malignancies Diagnostic Services (incorporating molecular, immunophenotyping and cytogenetics).

St. Mary's Hospital (SMH) site:
There is no on-site service (pre-booked frozen sections to be couriered to CXH site)

Hammersmith Hospital (HH) site:
Histopathology (pre-booked frozen section service only) – 1st floor 'G' Block
Specialised Integrated Haematological Malignancies Diagnostic Services (SIHMDS) – 2nd floor 'G' Block

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

Chelsea and Westminster (CW) site:
Pre-booked frozen sections
Pre-booked Moh's frozen section service

Hillingdon Hospital site:
Pre-booked Moh's frozen section service

## DESCRIPTION OF SERVICE

The Cellular Pathology laboratories provide a comprehensive diagnostic service including frozen sections and a rapid service for urgent biopsies and fine needle aspirates. Electron microscopy is available at Charing Cross. The Specialised Integrated Haematological Malignancies Diagnostic Services (SIHMDS) operates on the Hammersmith site.

Tests are accredited as identified on the UKAS schedule of accreditation (9615) 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 11377 |
| Electron Microscopy | 020 331 17147 |

KEY CONTACT TELEPHONE NUMBERS HH

| | |
|---|---|
| Molecular Diagnostics | 020 331 32179 |
| Cytogenetics | 020 331 32169 |
| Immunophenotyping | 020 331 31504 |
| SIHMDS laboratory Manager | 020 331 32179 |

# KEY PERSONNEL TELEPHONE NUMBERS

Divisional Manager Cellular Pathology: Danya Cohen – 020 331 15196

Cancer Services Manager: Soma Pillay – 020 331 35902

Divisional Clinical Lead for Cellular Pathology: Professor Mike Osborn – 020 331 10237

Cellular Pathology Quality & Governance Manager: Michael Donovan – 020 331 15171

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.

**Cellular Pathology Consultant Pathologists**

| Specialty Area | Consultant Pathologist | Extension Number |
|---|---|---|
| Breast & Dermatopathology | Dr. Faiza Rashid | x10451 |
| Gastrointestinal/Breast | Dr. Kevin Lessey | x15176 |
| Breast/Upper & Lower GI | Dr Anne Thorpe | x35904 |
| Non-Gynae Cytopathology/GI | Dr. Priya Mairembam | x10450 |
| Upper & Lower GI/Gynae/Urology | Dr Sidhika Dandona | x30569 |
| HIV/Hepatobilary/Upper & Lower Gastrointestinal | Prof. Rob Goldin | x30570 |
| Upper & Lower Gastrointestinal | Dr. Panagiota Mavrigiannaki | x17081 |
| Gastrointestinal/Pancreatobiliary | Dr. Pat Cohen | x17100 |
| Post Mortem/Breast/Lower Gastrointestinal | Prof. Mike Osborn | x10237 |
| Hepatobilary/Urology/Upper & Lower Gastrointestinal | Dr. Jo Lloyd | x17144 |
| Upper & Lower Gastrointestinal, Dermatology | Dr Priscilla Anketell | x10449 |
| Head & Neck, Breast, Endocrine, Placenta | Dr Suchana Mukhopadhyay | x17150 |
| Renal Pathology | Dr. Candice Roufosse | x10425 |
| Gynaecological Pathology | Prof. Mona El-Bahrawy | X33442 |
| Trophoblast/Gynaecological Pathology | Dr. Baljeet Kaur | x10426 |
| Gynaecological Pathology/Non-Gynae Cytology & Respiratory | Dr. Nandita Gupta | x10414 |
| Gynaecological Pathology/ Non-Gynae Cytology & Respiratory | Dr. Patrizia Viola | x10419 |
| Haematopathology/ Respiratory/ Gynaecological Pathology | Dr. Saral Desai | x10430 |
| Cytopathology/Pancreatobiliary/ Haematopathology | Dr. Raida Ahmad | x10423 |
| Haematopathology/Endocrine/Cardiac | Dr. Rashpal Flora | x10420 |
| Urology | Dr. Ethna Mannion | x10413 |
| Cytopathology/ Gynaecological Pathology/Placental Pathology | Dr. Priya Bhagwat | x10410 |
| Urology/renal/PMs | Dr. Andrew Smith | x10415 |
| Urology/ Gynaecological Pathology | Dr Rana Asakra | x10417 |
| Urology/ Gynaecological Pathology/Germ Cell | Dr. Maidie Yeung | x10412 |
| Non-Gynae Cytopathology | Dr. Corrina Wright | x10279 |

| Specialty Area | Consultant Pathologist | Extension Number |
|---|---|---|
| Dermatology/Breast | Dr. Rathi Ramakrishnan | x35909 |
| Dermatology/Urology | Dr. James Carton | x35906 |
| Dermatology/HIV/Paediatric GI | Dr. Nick Francis | x15494 |
| Neuropathology | Dr. Javier Alegre | x17284 |
| Morphology/ MDT Lead | Dr Sasha Marks | x31505 |
| Immunophenotyping | Dr. Elisabet Nadal-Melsio | x31505 |
| Trophoblast | Prof. Neil Sebire | Email only |
| Gastrointestinal/Dermatopathology/PM | Dr Mark Wilsher | x17041 |
| Breast/Urology/PM | Dr Anna Silvanto | x30560 |
| Haematopathology/Cytology , Thyroid | Dr Mufadil Moonim | x10422 |
| Gynae/Trophoblast | Dr Jacqueline McDermott | x10424 |
| Gynae | Dr Tarah Brah | x33968 |
| Lower GI, Dermatology and Pancreas | Dr Rashmi Shetty | x10448 |
| Haematology | Dr Ketan Patel | x31509 |
| Breast/Gynae | Dr Saima Khan | x10447 |
| GI/ | Dr Chishimba Sokota | x10441 |
| Gynae | Dr Iteeka Arora | x10425 |
| Dermatology/Breast | Dr Nilashki Gupta | x35918 |

The service has specialty lead Pathologists as identified below:

**Cellular Pathology – Specialty Leads reporting to Chief of Service Professor Mike Osborn**

- **Dermatopathology – Dr Mark Wilsher**
- **Neuromuscular – Dr Javier Alegre**
- **Uropathology – Dr Jo Lloyd**
- **Haemotopathology (including Haematological Molecular Diagnostics)- Dr Rashpal Flora (Haematopathology) and Dr Elisabet Nadal-Melsio (Haematology)**
- **Cytology – Dr Priya Bhagwat**
- **Training & Education (junior medics) – Dr Suchana Mukhopadhyay and Dr Sidhika Dandona**
- **Breast – Dr Rathi Ramakrishnan and Dr Suchana Mukhopadhyay**
- **ENT, Head and Neck & Musculoskeletal – Dr Suchana Mukhopadhyay**
- **Lung – Dr Saral Desai**
- **Endocrine & Cardiovascular – Dr Rashpal Flora**
- **Gynaecology – Dr Jackie McDermott**
- **GI, Liver & Pancreas – Prof. Rob Goldin**
- **Adult Autopsies – Prof. Mike Osborn**
- **Trophoblast and Germ cell – Dr Baljeet Kaur**

Key Contact Numbers – Frozen section booking

| | | |
|---|---|---|
| Frozen section bookings | Clearly state the site when booking | x17143 |

Key Contact Numbers - Charing Cross Site

| | | |
|---|---|---|
| Laboratory Manager | Nymeth Ali<br>Alpana Vithal | x11377 |
| Immunocytochemistry Manager | Gail Valentine | x11377 |
| Cancer Services Manager | Soma Pillay | x35902 |
| Duty Registrars – 2nd floor | | x17131 |
| Duty Registrars – 3rd floor | | x17690 |
| Duty Registrars – 6th floor | | x15217 |
| General Enquiries Histopathology | | x17132/x17139 |
| Electron Microscopy | Dr Linda Moran | x17147 |

Key Contact Numbers - Hammersmith Site

| | | |
|---|---|---|
| Frozen section lab (not constantly attended) | Call x17143 in advance to book | x32289 |
| Laboratory Manager (SIHMDS) | Nuha Abdellatif | x32179 |
| Molecular Principal Clinical Scientist Lead | Chloe Hayden | x32167 |
| Immunophenotyping | Dr. Elisabet Nadal-Melsio | x31505 |
| Cytogenetics | Dr Udayakumar Achandira | X31503 |

## LABORATORY HOURS

The laboratories are open for inquiries between 8am and 5pm Monday – Friday. There is no out of hour's service except for renal pathology. Please discuss out of hours renal pathology requirements with Dr. Candice Roufosse (ext: 33280).

## SMALL URGENT SAMPLES – RAPID PROCESSING

Any specimen requiring an urgent result must be discussed with the Histology laboratory or the 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 p7 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 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 Specialised Integrated Haematological Malignancies Diagnostics Service (SIHMDS) laboratories please contact Chloe Hayden x32167 with molecular queries, Dr Udayakumar Achandira (x31503) with cytogenetic queries and Dr Elisabet Nadal - Melsio (x31505) with Immunophenotyping queries.

For clinical advice regarding solid tumour results including (NTRK Fusion Panel and BRCA testing) please contact Royal Marsden on rmh-tr.moleculardiagnostics@nhs.net. All initial request forms have to be sent to Charing Cross Histology via email at imperial.copath@nhs.net. Please ensure molecular pathology are copied for this request at imperial.moleculardiagnostics@nhs.net.

## TECHNICAL ADVICE

For technical advice from a Biomedical Scientist, please contact the Histopathology & Cytology main laboratory on x30560.

For advice from a member of the SIHMDS 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

No cervical screening is performed within NWLP. All of these screening samples are now handled by CSL (HSL).

## 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.

Clinical FNA's

There are occasions where FNA's will be performed by clinicians. 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 Cytology laboratory (x30560). 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 laboratory (x30560) if you are unsure.*

Slides produced from clinical FNA preparations must be 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 laboratory (x30560)*

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°C.

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.

**Please note – where a differential count is included as part of the report, this is not a UKAS accredited test.

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). The TAT target for CSF samples is to have 80% of results available in 48 hours.

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.

## Histopathology

Routine Histopathology

Specimens must be placed in an adequately sized container, containing sufficient 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. If you are unclear how to obtain NBF call the laboratory managers on x11377 and they will advise.

Certain biopsies are better preserved using alternative fixatives e.g. testicular biopsies or phaeochromocytomas. These are available if required by contacting the laboratory (x30560).

Clinical teams are advised against slicing in to specimens unless they have received specific guidance from the relevant Pathologist. Slicing into specimens may disturb critical margins and this has the potential to impact adversely on the results obtained histologically.

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

Turnaround times for histology specimens (excluding cases requiring decalcification, referral or other additional investigations) – 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).

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.

Please note that residual tissue from Histology specimens is retained for 4 weeks post sign out of report.

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.

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 x17143. It is important that you state the site at which the frozen section will be performed as scientific staff will be required to travel to that site to perform the procedure.

At the time of booking, 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 to call when the result becomes available.

*All frozen sections must be arranged 48 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 laboratory on x17143 to discuss.
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, although 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 (x30554/30560).

Please do not affix the patient label over any label which has been applied by the laboratory.

For renal biopsies at Hammersmith, Nunc tubes filled with Transport Fixative are obtained from Histopathology (x30554/30560) 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 unless they fit the criteria outlined for frozen sections above.

Electron Microscopy

The Electron Microscopy (EM) Unit: located on the 6th floor (Laboratory block) at Charing Cross Hospital (CXH). The Unit is staffed Monday to Friday from 06:00 – 18:00, excluding bank holidays. There is no "out of hours" service but every attempt is made to meet urgent clinical requirements upon discussion with the Clinical Scientist. Tissue biopsies are generally processed daily although samples which arrive at the end of the day or require further fixation will be stored overnight in a fridge (4°C) before processing.

Tissue biopsies: small tissue samples (no greater than 1mm in one dimension) should be sent to the EM Unit (Histopathology Department) in pre-dispensed EM fixative (EM Fix: 3 % glutaraldehyde in 0.1M sodium cacodylate buffer) in labelled vials (with a minimum of three patient identifiers) and accompanied by the Patient Request form which contains patient demographics i.e., Patient's full name, date of birth, Unique hospital/NHS number, nature of specimen/site of biopsy and date and time that the sample was taken.

EM Fix: pre-dispensed EM fixative containers are available from the Specimen Reception at Hammersmith Hospital (x32148 or x32287), the Histopathology Department Charing Cross Hospital (x30554 and x30560) and at Chelsea and Westminster Hospital (Preps [laying-up] Room between Theatres 3 & 4; Main Theatre x58339). EM fixative containers are also available directly from the EM Unit in advance on request (x30571/x17147/x30587/x10429/x10428).

Ultrastructural diagnostic examination: the most commonly handled surgical biopsies are renal core biopsies. For any other surgical specimens, please contact the EM Unit for advice from the Clinical Scientist Dr Linda Moran.

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 Clinical Scientist in the EM Unit.

Turnaround time: 95% of all renal native biopsies are to be reported within 7 working/calendar days; for other surgical specimens this may not always be achievable due to the complex interpretive nature of the EM specimens

All enquires to the Clinical Scientist: Head of EM Unit Dr Linda Moran PhD (e-mail: linda.moran1@nhs.net or Telephone: 0203 311 7147 or 020 331 10428).

Muscle Biopsies

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 2pm 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. Any samples that do **NOT** make the cut off will be put into formalin and can be sent with the scheduled courier the next day.

Bone Marrow Trephine (BMT)

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

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). Package the specimen pot and forms in specimen bag.
Print a copy of the theatre list and update to include:

a. Number of pots
b. Please manually score through any of the patients who did not have a sample for histology.

Drop samples at CXH main specimen reception 2pm latest.

Renal Biopsies

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 laboratory managers x11377.

## Mortuary Services

Pathology no longer manages or governs the mortuary service. Please direct all Imperial mortuary queries to Christine Dorsett (christine.dorsett@nhs.net). Alternatively, call the mortuary at St. Mary's on 020 331 21191.

## 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 |
|---|
| Viapath Analytics LLP, King's College Hospital, King's Red Cell Centre- Haemoglobinopathy service on behalf of Haematology - Alpha Thalassemia, Alpha Sequencing,Beta Thalassemia,<br>Red Cell NGS: Membranopathy, UGT1A1, G6PD, Congenital Erythrocytosis, Iron Regulation and Hereditary Pyropoikilocytosis |
| Viapath Analytics LLP, King's College Hospital - King's HMDC Laboratory - CBFB MRD<br>RUNX1-RUNX1T1 MRD<br>New patients NOT accepted – follow-up cases only |
| Guy's Hospital, Molecular Oncology - PML-RARA MRD, NPM1 MRD, CBFB MRD and RUNX1-RUNX1T1 MRD |
| The Royal Marsden, Centre for Molecular Pathology - IGHV Mutation, RNA fusion panel, CBFB MRD, RUNX1-RUNX1T1 MRD and NPM1 MRD |
| Royal London Hospital - MYD88, BRAF and ALL MRD |
| Great Ormond Street Hospital, London North NHS Genomic Laboratory Hub, Rare and Inherited Disease Genomic Laboratory - Testing as requested – see referral form |

| |
|---|
| Great Ormond Street Hospital, London North NHS Genomic Laboratory Hub, Level 2 Camelia Botnar Laboratories - Testing as requested – see referral form |
| Newcastle NHS Highly Specialised Service for Rare Mitochondrial Disorders - Mitochondrial Genetic Disorders & Histology Muscles |
| HSL-Advanced Diagnostics – Ad-hoc Molecular & ICC tests |
| Eurofins Biomnis France - Cytogenetics (gliomas) |
| National Hospital for Neurology & Neurosurgery, UCLH, Queen Square - Muscle/Neuropathology |
| Wessex Regional Genetics Laboratory - C-KIT (D816V). PDGFRA and PDGFRB -On request only |
| Barts Health NHS Trust - SIHMDS (Myeloid panel & Histology 2nd opinions) |
| Royal National Orthopaedic Hospital NHS Trust - Histopathology |
| Oxford John Radcliffe Hospital – Neuropathology, Muscle, Nerve Histopathology |
| The National Hospital for Neurology and Neurosurgery, Queens Sqaure, UCLH – Nerve Histopathology, Muscle, Neuropathology |
| Royal Marsden Hospital - Histopathology 2nd opinions |
| Unilabs Ltd - Histopathology 2nd opinions |
| St George's Healthcare NHS Trust - Cardiac and miocardial bx Histopathology |
| Limb Girdle Muscular Dystrophy Muscle Immunoanalysis Unit - Limb Girdle Muscular Dystrophy |
| St John's Institute of Dermatology (Viapath) - Histopathology 2nd opinions |
| Addenbrookes Hospital - FIP1L1-PDGFRA |
| Guy's Hospital - NPM1 |
| Source Bioscience Nottingham - Lynch testing, KRAS, BRAF |
| St. Thomas Hospital (Viapath) - VWF-A1 domain Exon28 |

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.

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.

## 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 number and e-mail contacts.

Material should be addressed to:
Histopathology Department (for the attention of Dr Rashpal Flora)
3rd floor Laboratory Block
Charing Cross Hospital
Fulham Palace Road
London
W6 8RF

# SPECIALISED INTEGRATED HAEMATOLOGICAL MALIGNANCIES DIAGNOSTICS SERVICE (SIHMDS) - Hammersmith Hospital

The Specialised Integrated Haematological Malignancies Diagnostic Service (SIHMDS) at Hammersmith Hospital provides a comprehensive diagnostic service in molecular genetics, cytogenetics, morphology and immunophenotyping. Scientific and clinical interpretation is provided for all cases. The specialty lead for the SIHMDS is Dr Elisabeth Nadal – Melsio.

The department is part of the London North Genomic Laboratory Hub (GLH).

The laboratory operates within the professional guidelines of the Association for Clinical Genomic Science (ACGS) and the Royal College of Pathologists (RCPath) and participates fully in relevant external quality assurance schemes (performance data available on request).

The laboratory offers the following:

- A diagnostic and measurable residual disease (MRD) monitoring service for *BCR::ABL1* patients with Chronic Myeloid Leukaemia (CML), Acute Myeloid Leukaemia (AML) or Acute Lymphoblastic Leukaemia (ALL).
- A *BCR::ABL1* tyrosine kinase domain (TKD) NGS service for treatment determining testing in *BCR::ABL1* positive CML, AML or ALL patients.
- A myeloid NGS service for diagnostic, prognostic and treatment determining testing in myeloid diseases, such as AML and myelodysplastic syndrome (MDS).
- A rapid *FLT3* ITD, *FLT3* TKD and *NPM1* service for prognostic and treatment determining testing in AML.
- A chimerism monitoring service for bone marrow transplant patients.
- A targeted MPN NGS panel used for diagnostic, prognostic and treatment determining testing in myeloproliferative neoplasms.
- A B-cell (IGH V-J, IGK and IGKde) and T-cell (TCRG) clonality service for patients with suspected lymphoma.
- A whole genome sequencing service for haematological malignancies.
- An APOE genotyping service for prognostic testing in coronary heart disease, type III hyperlipoproteinaemia and strokes.
- A flow cytometry service for haematological malignancies.
- A Paroxysmal Nocturnal Haemoglobinuria (PNH) screening and follow-up service.
- A karyotyping and molecular cytogenetic (FISH) service for haematological malignancies and solid tumour samples.

Laboratory Opening Hours:
The laboratory is staffed Monday to Friday from 9:00am – 17:00pm, excluding bank holidays. There is no out of hours service but every attempt is made to meet urgent clinical need. For same day processing samples must arrive by 14:30pm. Samples arriving after this, unless already agreed in advance with the laboratory will be processed on the following working day. Samples arriving out of hours should be taken to the Central Specimen Reception area on the ground floor. Samples that have been taken and will be sent to the laboratory on the following day should be stored in a fridge at 4°C overnight.

Sample retention Times:

| Type of sample | Minimum retention | Retention time and storage conditions |
|---|---|---|
| **Peripheral blood/bone marrow/buffy coat tubes** | As for non-permanent/surplus specimens: Until verification of completed report. | • Molecular: 1 tube from each specimen entry kept refrigerated for 1 month post reporting.<br>• Flow: Refrigerated for a minimum of 6 months following authorisation of report..<br>• Cytogenetics: Refrigerated until 1 week after report authorised. |
| **Fluid – ascitic, CSF, pleural, BAL, FNA, vitreous, EBUS etc.** | As for non-permanent/surplus specimens: Until verification of completed report. | • Flow: Refrigerated for a minimum of 6 months following authorisation of the report.<br>• Cytogenetics: Refrigerated for a minimum of 1 week after report authorised (ascetic acid/CSF) |
| **Whole lymph node** | As for non-permanent/surplus specimens: Until verification of completed report. | • Flow: Refrigerated for a minimum of 6 months following authorisation of the report. |
| **Tissue blocks** | N/A | • North West London Pathology blocks are retained in Charing Cross Histology lab. |
| **CD3 + T cells (separated for chimerism analysis)** | Minimum of 3 months after final report authorised. | • 3 months post receipt date.<br>Stored in a -20°C freezer |
| **CD138 B cells (separated for myeloma analysis)** | Minimum of 2 weeks after final report authorised. | • All cells not used for FISH stored for 2 weeks after final report authorised.<br>• Stored in a -20°C freezer |
| **DNA** | • Family studies or donor/recipient: 30+ years.<br>• Other: Minimum 8 weeks post final report authorisation. | • Family studies, donor/recipient: 30 years.<br>• Other: 1 year post final report.<br>• Short term storage in a fridge at 2-8 °C or long-term storage in freezers at -20°C/-80°C. |
| **GTC** | Minimum of 8 weeks after final report authorised. | • 30 years.<br>• Short term storage in -20°C freezer; long-term storage in -80°C freezer. |
| **cDNA** | Minimum of 8 weeks after final report authorised. | • 6 months post receipt date.<br>• Stored in a -20°C freezer. |
| **Fixed cytogenetic cell suspension** | Retention for at least three months. | Retention for minimum of three months but longer if space permits. Acute diagnostic cases kept for 1 year.<br>Stored in a -20°C freezer |
| **Stained slides** | • 2 years after final report as digitised images available | G-banded Slides stored in metal labelled slide filing cabinets in room G306. FISH slides kept in Fridge 10 on the 4th shelf in room G306 |

| | | |
|---|---|---|
| | • FISH slides until final report authorised. | Digitised FISH and Cytogenetics images 30 years retention on pathology servers linked to analysis systems. |
| **Morphology slides** | • Stained films used for diagnosis, 30 years minimum.<br>• Surplus unstained slides discarded upon completion of the clinical report. | Flow morphology slides are stored for 30 years on the Hammersmith Hospital site in rooms G205a (2021-current); G311 (2014-2021); Mortuary (pre 2014). |
| **PCR products/NGS library** | As for non-permanent/surplus specimens: Until verification of completed report. | Refrigerated (PCR products) or frozen (NGS library) until verification of completed report. |

Contact Details:
Molecular diagnostics testing enquiries: imperial.moleculardiagnostics@nhs.net
Cytogenetic testing enquiries: imperial.cytogenetics@nhs.net
Immunophenotyping testing enquiries: imperial.immunophenotyping@nhs.net

Telephone Enquiries:
Molecular Diagnostics: 020 3313 2179
Cytogenetics: 020 3313 2169
Immunophenotyping: 020 3313 1504

Departmental Contacts:
SIHMDS Clinical Consultant Lead (HH): Dr Elizabeth Nadal- Melsio.
Molecular Pathology Service Lead: Chloe Hayden
Cytogenetics Service Lead: Dr Udayakumar Achandira
Immunophenotyping Service Lead: Dr Elisabet Nadal-Melsio
Morphology Sevice Lead/MDT Lead: Dr Sasha Marks
SIHMDS Laboratory Manager: Nuha Abdellatif

Sending Samples:
Please send samples to Molecular Pathology Laboratory/SIHMDS, 2nd Floor, G-Block, Hammersmith Hospital, Imperial College Healthcare NHS Trust, Du Cane Road, London, W12 0HS. Samples sent by Royal Mail or courier must comply with PI 650 for category B substances. The package should be clearly labelled 'diagnostic specimen UN3373'.
N.B. Samples that have been taken near the end of the day and will be sent to the laboratory the next morning should be stored in a fridge at 4°C overnight.

Sample Requirements:
It is the responsibility of the referring clinician to ensure that all requests meet testing criteria, samples are correctly labelled and that request forms are completed to an appropriate standard. All samples must have a minimum of 3 matching identifiers both on the sample and the request form. If samples do not meet these identification criteria, they will be rejected.

Minimum sample labelling criteria:
- Patient's full name (surname/family name and first/given name or initials for trial patients)
- Date of birth
- Unique hospital/NHS number or trial ID for trial patients
- Date and time that the sample was taken

These are minimum labelling criteria and it is highly recommended to also provide the patient gender

Request Forms:

SIHMDS has its own referral forms that are available on the NWLP website.

All solid tumour requests are to be completed using the Royal Marsden request form, available on the NWLP website.

All requests for germline red cell requests are to be completed using the King's request form, available on the NWLP website.

# CYTOGENETICS

The cytogenetics section processes samples from bone marrow and peripheral blood from referrals with haematological malignancies. Both conventional cytogenetic and molecular cytogenetic (FISH) analysis performed to test for acquired chromosomal abnormalities in order to establish a diagnosis, monitor treatment and provide prognostic information. FISH testing on FFPE tissue sections is also offered on a range of haematological malignancy and solid tumour referrals.

| DISEASE | KARYOTYPE | FISH PROBE |
|---|---|---|
| Chronic myeloid leukaemia (CML) at diagnosis | ✓ | Rapid FISH for *BCR::ABL1*; t(9;22)(q34;q11) |
| CML at follow up | Done until remission confirmed then only if evidence of relapse/transformation/ by special request | *BCR::ABL1*; t(9;22)(q34;q11) |
| Acute Myeloid Leukaemia (AML) at diagnosis | ✓ | Performed on all diagnostic AML cases.<br>*BCR ::ABL1*; t(9;22)<br>*RUNX1T1 ::RUNX1*; t(8;21)<br>*PML ::RARA* :t(15 ;17)<br>*CBFB*: inv(16)/t(16;16)<br>*MECOM*; inv(3)/t(3;3)<br>*KMT2A*: 11q23<br>del 5q/-5, del(7q)<br>TP53 (17p13) |
| AML follow-up | Only at first remission if abnormal at diagnosis. All samples with suspected relapse/transformation | If abnormal at diagnosis |
| Myelodysplastic syndromes (MDS) | ✓ | Failed specimens : FISH for del 5q/-5, del(7q), -7, 8,20q12/20qter |
| Myeloproliferative neoplasms (MPN), myelofibrosis and CMML | ✓ | *BCR::ABL1* on request<br>*PDGFRB* (5q32) on CMML cases with eosinophilia and a normal karyotype<br>*PMF if karyotype fails: MECOM*;<br>*KMT2A*, del(7q), CEP 8, ETV6, 20q, TP53 (17p13) |
| Eosinophilia (HES/CEL) | X<br>By request on cases with abnormal FISH results | *FIP1L1-PDGFRA*; 4q12<br>*PDGFRB*; 5q32<br>*FGFR1*; 8p11<br>*BCR::ABL1*; t(9;22)(q34;q11) by request |

| DISEASE | KARYOTYPE | FISH PROBE |
|---|---|---|
| | | |
| ITP | X | X |
| Bone marrow Failure Syndromes (Aplastic Anaemia, Fanconi anemia, dyskeratosiscongenita, Diamond Blackfan anemia, and Shwachman Diamond syndrome. | By request if evidence of disease transformation | By request |
| Sex mis-matched BMT | Only if the % of recipient cells is significant by FISH consistent with relapse | XY |
| B-cell precursor lymphoblastic leukaemia | ✓ | *BCR ::ABL1*; t(9;22)(q34;q11)<br>*KMT2A*; 11q23<br>*ETV6::RUNX1*; t(12;21)<br>*TCF3*; 19p13, *ABL1 (9q34),CDKN2A (9p21)*<br>*MYC(8q24), BCL2*; 18q21<br>*BCL6*; 3q26 *IGH* ::MYC;t(8;14<br>Hyperdiploid/Hypodipoid panel for enumeration of chromosomes 4,14, 18, 8 and 21<br>*PDGFRB* (5q32)<br><br>*ABL2 (1q25) JAK2(9p13) CSFIR(5q322), CRLF2 (Xp22/Yp11) . Referral for WGS/RNA fusion panel externally* |
| T-cell lymphoblastic leukaemia | ✓ | *BCR :: ABL1*; t(9;22)(q34;q11)<br>*KMT2A*; 11q23<br>*TCR* alpha/delta (TCRA/D); 14q11 |
| T-PLL | ✓ | *TCR* alpha/delta (TCRA/D); 14q11<br>*ATM*; 11q22.3,<br>*CEP 8* |
| High-grade Non-Hodgkin's lymphoma | ✓ | *MYC*; 8q24<br>*IGH*; 14q32<br>*BCL2*; 18q21<br>*BCL6*; 3q26<br>*IGH*-MYC;t(8;14)<br>*IGH ::BCL2*;t(14 ;18)<br>*IGH ::CCND1* t(11 ;14) |
| CLL | X | *ATM/TP53*; 11q22.3/17p13<br>*DLEU/LAMP*; 13q 14/13q34<br>*CEP* 12 |

| DISEASE | KARYOTYPE | FISH PROBE |
|---|---|---|
| Follicular lymphoma | X | *IGH-BCL2; t(14;18)* |
| Multiple Myeloma<br>(Sequential FISH is performed on CD138+ purified plasma cells)<br>(confirmed diagnostic/relapse referrals) Not MGUS or monitoring samples | X | *CDKN2C (1p32.3)/CKS1B(1q21)*<br>*TP53;* 17p13<br>*IGH;* 14q32<br>*IGH-FGFR3;* t(4;14)<br>*IGH-MAF;* t(14;16)<br>*IGH-MYEOV/CCND1;* t(11;14)<br>Ploidy for chromosomes 9, 5 and 15 |
| Lymphoma FFPE | X | *MYC;* 8q24<br>*BCL2;* 18q21<br>*BCL6;* 3q26<br>*IGH;* 14q32<br>*IGH ::MYC;t(8;14)*<br>*IGH ::BCL2;t(14 ;18)*<br>*IGH ::CCND1 t(11 ;14)* |

Sample requirements and turnaround times:

| TEST | Sample requirements | Turnaround Time | COMMENT |
|---|---|---|---|
| Karyotype/FISH | A minimum of 2-3mls Bone marrow in lithium heparin<br>3-5mls peripheral blood in lithium heparin (if disease cells are present in sufficient numbers to allow cell culture and/or FISH studies, as appropriate)<br><br>EDTA PB and BM samples (>1ml) are acceptable for FISH only studies as appropriate.<br><br>Other fresh tissues can be analysed by FISH eg ascitic fluid or CSF and have no specific requirements | Urgent (rapid) FISH: up to 3 calendar days.<br><br>AML FISH panel (diagnostic)– up to 3 calendar days<br><br>Urgent karyotype/FISH: 14 calendar days<br><br>Routine diagnostic samples Karyotype and/or FISH: 21 calendar days<br><br>Follow-up samples/remission: 21 calendar days | The date and time the sample was taken must be legible<br><br>Samples should arrive within 24 hours if possible and not >72 hours. Sample will not be rejected if >72 hours but will have a greater risk of failure. The laboratory does not open at weekends.<br><br>Samples not dispatched on the same day should be refrigerated at 4°C overnight and sent as soon as possible the following day. |
| FFPE FISH on tissue sections | 4 to 6 slides (1~2µm thick) with an H&E marked slide (essential in cases where only part of the tissue is infiltrated, or only part of the tissue is appropriate for screening)<br>Sections should be mounted on APES-coated (or equivalent) positively charged slides.<br>6 slides for lymphoma cases | 14 calendar days | Tumour content and block ID must be provided on the request form. |

**Please note :**

If the blood counts are abnormal (high or low white cell count) the volumes of BM/blood requested can be adjusted accordingly. For culture (karyotyping) a WCC of 5x10^6 cells per ml is optimal.

It is preferable not to send myeloma samples after 12pm on Fridays due to the time required to perform CD138 separation

Delayed samples:
Samples should arrive in the laboratory as soon as possible after sampling. Samples delayed in transit may yield poor quality or failed results.

# IMMUNOPHENOTYPING (FLOW CYTOMETRY) LABORATORY

The immunophenotyping section provides comprehensive flow cytometric analysis for a wide variety of disorders which are listed below. The laboratory performs investigation of fluid specimens including peripheral blood, bone marrow, cerebrospinal fluid (CSF), pleural/ascitic fluids, endobronchial ultrasound (EBUS), bronchoalveolar lavage (BAL), fine needle aspirates (FNA), rare fluids (for example vitreous) and whole lymph nodes/biopsies. The flow cytometry panels selected are based on the clinical details provided. It is therefore of paramount importance to provide this information.

| Disease Investigations |
|---|
| Acute Myeloid Leukaemia (AML) |
| Acute Lymphoblastic Leukaemia (ALL) |
| Myeloproliferative Disorders (MPD) |
| Myelodysplastic Syndromes (MDS) |
| Aplastic Anaemia and other pancytopenias |
| Chronic Lymphocytic Leukaemia (CLL) |
| Lymphocytosis and Plasma Cell Disorders |
| Paroxysmal Nocturnal Haemoglobinuria (PNH) screening and follow-up |

Sample requirements:

Cell Markers (Immunophenotyping)

For optimal results:

| | |
|---|---|
| Peripheral blood/bone marrow | 1mL – 2.5mL (bone marrow) or 5mL (peripheral blood) in EDTA (lavender top).<br>Samples delayed in transit for more than 24 hours may yield poor quality results especially in myeloid panels. |
| Cerebrospinal fluid/plural effusion/ascetic fluid/tissue biopsy | Fluid specimens should be sent in a sterile universal.<br>Biopsies should be sent in saline in a sterile container.<br>Fluid or biopsy samples delayed in transit for more than one day may yield poor quality results, therefore it is important to transport to the laboratory on the day of collection for arrival before 15:00pm. For CSF samples due to arrive after 15:00pm, please preserve them with TransFix® (cellular antigen stabilising reagent), refrigerate overnight and transport on the following day (pre-prepared tubes are available for collection in the laboratory upon request). |

Paroxysmal Nocturnal Haemoglobinuria (PNH)

For optimal results:

| | |
|---|---|
| Peripheral blood | For Paroxysmal Nocturnal Haemoglobinuria (PNH) screening and follow-up, please send 1ml-5ml peripheral blood in EDTA. Samples must arrive in the laboratory within 48 hours of collection and before 15:00pm on Fridays. Samples older than 48 hours will be rejected. |

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 15:00. Samples sent on a Friday must be received by 2pm for same day processing. 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.

Reporting times:

Urgent referrals – 95% within 1 calendar day

Routine - 95% within 7 calendar days

# MOLECULAR PATHOLOGY LABORATORY

MOLECULAR GENETIC TESTING:

| TEST | SAMPLE REQUIREMENTS | TURNAROUND TIME | COMMENT |
|---|---|---|---|
| | | | |
| *BCR::ABL1* Multiplex PCR for screening and transcript identification | 15-20ml of peripheral blood or 3-5ml bone marrow in EDTA. Samples should be less than 72 hours old (3 days), but must be less than 5 days old upon receipt within the laboratory and be received before 14:30pm. Any samples received after 14:30pm will be accessioned the next working day and processed according to that date.<br><br>In instances where this is not possible, please send >25ul of cDNA.<br><br>For other sample types, please liaise with the laboratory. | 14 calendar days; 21 calendar days for rare transcript samples | For the diagnosis of CML, or prognosis of ALL and AML patients. Please also request cytogenetic testing in these instances as the turnaround time is faster.<br><br>The laboratory is not UKAS accredited for this test due to a change in equipment/assay. Awaiting assessment. |
| *BCR::ABL1* measurable residual disease (MRD) monitoring by RT-qPCR | 15-20ml of peripheral blood or 3-5ml bone marrow in EDTA. Samples for MRD monitoring must be less than 72 hours old (3 days) upon receipt within the laboratory and be received before 14:30pm. Any samples received after 14:30pm will be accessioned the next working day and processed according to that date.<br><br>Diagnostic, pre-treatment, relapse or TKD samples must be less than 5 days old upon receipt within the laboratory. | 14 calendar days for major (e13a2/e14a2) and minor transcript (e1a2); 21 calendar days for rare transcript samples | For *BCR::ABL1* baseline quantification and MRD monitoring of patients either on treatment with tyrosine kinase inhibitors or other therapeutic agents; post-transplantation; or off treatment.<br><br>Results from the RT-qPCR assays are reported as a ratio between *BCR::ABL1* and *ABL1*. The major e13a2 and/or e14a2 transcripts are also reported on the international scale (IS) by use of a laboratory specific conversion factor.<br><br>The laboratory is not UKAS accredited for minor (e1a2) or rare transcript RT-qPCR testing. The minor (e1a2) RT-qPCR is awaiting assessment. |

| TEST | SAMPLE REQUIREMENTS | TURNAROUND TIME | COMMENT |
|---|---|---|---|
| | In instances where this is not possible, please send >25ul of cDNA.<br><br>For other sample types, please liaise with the laboratory. | | |
| *BCR::ABL1* tyrosine kinase domain (TKD) testing by NGS | 15-20ml of peripheral blood or 3-5ml bone marrow in EDTA. Samples should be less than 72 hours old (3 days), but must be less than 5 days old upon receipt within the laboratory and be received before 14:30pm. Any samples received after 14:30pm will be accessioned the next working day and processed according to that date.<br><br>In instances where this is not possible, please send >25ul of cDNA.<br><br>For other sample types, please liaise with the laboratory. | 21 calendar days | For the detection of variants (mutations) in *BCR::ABL1* tyrosine kinase domain (TKD) and other drug binding regions (e.g. myristoyl pocket for asciminib) to assess possible treatment resistance and to guide treatment choices.<br><br>The laboratory is not UKAS accredited for this test due to a change in equipment/assay. Awaiting assessment. |
| *BCR::ABL1* tyrosine kinase domain (TKD) testing by Sanger Sequencing | Same as NGS method described above. | 21 calendar days | This test is a contingency method for the NGS method described above. |
| Factor V Leiden and Prothrombin gene mutation Genotyping | >1ml peripheral blood in EDTA.<br><br>For other sample types, please liaise with the laboratory. | 14 calendar days | Genotyping is performed by real time PCR for polymorphic thrombophilia risk factors. |
| ApoE genotyping | 4ml peripheral blood in EDTA.<br><br>For other sample types, please liaise with the laboratory. | 14 calendar days | A TaqMan FAST-PCR genotyping assay is used to determine the presence of the APOE 112T>C and 158C>T mutations.<br><br>The laboratory is not UKAS accredited for this test. |
| MPN NGS Panel | 4ml peripheral blood or >1ml bone marrow in EDTA. | 21 calendar days | Targeted NGS is performed for 13 genes implicated in MPNs. The panel covers sequencing of *JAK2* exon 12 and 14; MPL exon 10; and *CALR* exon 9 and hotspots in |

| TEST | SAMPLE REQUIREMENTS | TURNAROUND TIME | COMMENT |
|---|---|---|---|
| | For other sample types, please liaise with the laboratory. | | another 10 genes important for the diagnosis, prognosis and treatment of MPN patients.<br><br>The laboratory is not UKAS accredited for this test due to a change in equipment/assay. Awaiting assessment. |
| Myeloid NGS Panel | 4ml peripheral blood or >1ml bone marrow in EDTA.<br><br>For other sample types, please liaise with the laboratory. | 21 calendar days | The Oncomine Myeloid NGS panel is comprised of 40 key DNA genes to cover the most relevant targets in major myeloid disorders: acute myeloid leukaemia (AML), myeloid dysplastic syndrome (MDS), myeloproliferative neoplasms (MPN), chronic myeloid leukaemia (CML), and chronic myelomonocytic leukaemia (CMML). |
| *FLT3* and *NPM1* rapid PCR | 4ml peripheral blood or >1ml bone marrow in EDTA.<br><br>For other sample types, please liaise with the laboratory. | 3 calendar days | Detection of variants in *FLT3* and *NPM1* is used in the diagnosis and prognostic classification of MDS/AML patients. Mutation analysis is performed by rapid PCR and fragment analysis and allows for detection of *FLT3* ITD variants, *FLT3* TKD D835/I836 variants and insertions in *NPM1*. |
| Gene rearrangement (clonality) studies for *IGH*, *IGK* and *TCRG*) | A minimum of 1ml peripheral blood or bone marrow in EDTA. Please note that samples must be received within 72 hours of collection for lymphocyte separation to be performed.<br><br>FFPE tissue curls, uncoated/uncharged slides. Minimal tumour content of 5% is required for clonality studies. The tumour content and the amount of tissue to be cut must be assessed by a histopathologist prior to sending the sample. | 14 calendar days | IG/TCR clonality studies can help to discriminate between malignant and reactive lymphoproliferations in patients with suspected lymphoproliferative disorder. Multiplex PCR is performed using BIOMED-2 primers followed by fragment analysis to detect presence of clonal rearrangements in *IGH(V-J)*, *IGK*, $IGK_{de}$ and *TCRG*. |

| TEST | SAMPLE REQUIREMENTS | TURNAROUND TIME | COMMENT |
|---|---|---|---|
| | For other sample types, please liaise with the laboratory. | | |
| Chimerism studies (including T cell lineage (CD3+) | A minimum of 1ml peripheral blood or bone marrow in EDTA (lavender/purple top). Please note that samples must be received within 72 hours of collection for T-cell separation to be performed.<br><br>For other sample types, please liaise with the laboratory. | 14 calendar days | For the monitoring of bone marrow transplant patients. The proportion of donor DNA in post-transplant samples is detected by semiquantitative amplification of informative microsatellites in whole blood and T cell selected samples using PCR and fragment analysis. Pre-transplant donor and recipient samples must be provided alongside the first post-transplant sample.<br><br>Repeat chimerism tests should not be requested until 14 days between tests have elapsed to ensure the result is useful and meaningful in confirming relapse. Early testing may result in misleading results. |
| Haematological malignancies - Whole genome sequencing | For onward referral to GOSH the following is required:<br>- Patient choice consent form<br>- GMS test order form<br>- Appropriate germline sample<br>- Tumour sample<br><br>For more information please liaise with the laboratory. | 42 calendar days | For the detection of somatic and germline mutations and potential future biomarkers such as mutational signatures and tumour burden.<br><br>Current eligibility:<br>- All patients (adult and paediatric) with acute leukaemia (includes acute myeloid leukaemia, acute lymphoblastic leukaemia and acute leukaemia of ambiguous lineage) at initial diagnosis and/or on relapse.<br>- Paediatric patients with any other type of haematological malignancy at diagnosis and relapse.<br>- Proven or Suspected Haematological Tumours Exhausted all Standard of Care Testing and Treatment. |

**For other haem-onc genetic testing, please liaise with the laboratory.**

Delayed samples:
Samples should arrive in the laboratory as soon as possible after sampling. Samples delayed in transit may yield poor quality results and may be rejected as unsuitable.

Consent:

All genetic testing requires consent. The laboratory assumes that provision of a clinical sample, along with a completed referral form, implies that consent has been obtained by the referring clinician. This also includes consent for DNA storage where appropriate, including storage of DNA from patients where no genetic test is currently available/required, unless the referral form specifically indicates that this consent has not been given.

# 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 six 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).

West Middlesex University Hospital
Clinical Biochemistry and Specimen Reception are located on the 1st floor

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

Hillingdon Hospital
Clinical Biochemistry and Specimen Reception are located on the 1st floor.

## KEY PERSONNEL/CONTACT NUMBERS

| **Blood Sciences Department** | | |
|---|---|---|
| Divisional Manager | Rachel Tunstall | 17846 |
| Deputy Divisional manager (MDAL) | Mike Lyall | 15142 |
| Deputy Divisional manager (spoke sites) | Sreekanth Talluri | 21039 |
| Central Administration Office | | 35906/07 |

| Clinical Biochemistry Contacts | Bleep | Extension |
|---|---|---|
| Charing Cross Laboratory | 8161 | 17062/35924 |
| Hammersmith Laboratory | 9022 | 32109 |
| Chelsea and Westminster Laboratory | 0143 | 58094 |
| St Mary's laboratory | 21309 (routine hours) 1022 (out of hours) | 21039 |
| Hillingdon Hospital | 5602 | 01895 238282 Ext 2237 |
| West Middlesex University Hospital | 238 | 0208 321 5928 |
| | | |
| 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 Edmund Wilkes (Oncology) | 11400 | edmund.wilkes@nhs.net |
| Dr Jaimini Cegla<br>Dr Sirazum Choudhury | 26832 | j.cegla@nhs.net<br>sirazum.choudhury@nhs.net |

Key information for each site

Charing Cross Routine Service- 1st floor, Lab Block

| | Name | Extension | Bleep |
|---|---|---|---|
| Deputy Divisional Manager - MDAL | Mike Lyall | 15142 | |
| Clinical Biochemistry Lead | Sugirtha Jeyakumar | 17062 | |
| Laboratory | | 17004 | 8161 |

Hammersmith- G Block, North Corridor

| | Name | Extension | Bleep |
|---|---|---|---|
| Site Manager | Andy Osei-Bimpong | 31946 | |

| | | | |
|---|---|---|---|
| Laboratory | | 32113 | 9022 |
| Andrology Laboratory Manager | Lia Joannou | 33598 | |
| Gut Hormone Enquiries | | 33949 | |

Chelsea and Westminster- Level 2, Pathology

| | Name | Extension | Bleep |
|---|---|---|---|
| Site Manager | Dunstan Vincent | 58094 | |
| Laboratory | | 55133 | 0143 |

St Mary's-2nd floor Mint Wing

| | Name | Extension | Bleep |
|---|---|---|---|
| Site Manager | Daniel Pelling | 21309 | |
| Laboratory | | 21309 | 1022 |

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

| | Name | Extension | Bleep |
|---|---|---|---|
| Laboratory Manager | Vijay Ramanaidoo | 33696 | |

Hillingdon Hospital, Pathology

| | Name | Extension | Bleep |
|---|---|---|---|
| Site Manager | Linda Wildridge | 01895238282 EXT 2237 | |
| Laboratory | | 01895279288 | 5602 |

West Middlesex University Hospital, Pathology

| | Name | Extension | Bleep |
|---|---|---|---|
| Site Manager | Jyoti Panesar | 02083215928 | |
| Laboratory | | 02083215930 | 175 |

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 ICHC-tr-biochemistryadvice@nhs.net or through the Pathology Queries form on the website, are monitored during working hours and answered or 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

Urgent requests must be clearly identified as urgent (red bag/urgent label) 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 5:30pm 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 and West Middlesex University Hospitals

Urgent requests must be clearly identified as urgent (red bag/urgent label) 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 5:30pm 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.

Hillingdon Hospital

09:00 - 17:30 Monday – Friday
Apart from A&E, all urgent requests must:

1. Be notified to the laboratory by telephone
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.

# REPERTOIRE, SAMPLE REQUIREMENTS AND TURNAROUND TIMES

See Pathology website for specific test information www.NWLPathology.nhs.uk

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

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,<br>total protein, ammonia<br>(Please note; the level of the haemolysis may affect individual analytes to different extents.)<br>Xanthochromia (CSF) |
| Delay in separation/ receipt in laboratory | 4 hrs | PTH, renin |
| | 6 hrs | BNP |
| | 12hrs | Potassium, phosphate, bicarbonate |
| | 24hrs | Sodium, chloride, magnesium, creatinine<br>AST, LDH, iron |
| | 48hrs | Urea |
| | 72hrs | Bone profile (total protein, calcium, albumin, alkaline phosphatase)<br>Liver function (ALT, albumin, alkaline phosphatase, bilirubin, total protein) GGT, amylase<br>Lipid profile (LDL-cholesterol, triglyceride)<br>Uric acid<br>Iron, transferrin<br>CK |
| Particular collection requirements | Protect from light | Porphyrins (plasma and urine)<br>Vitamin A, Vitamin E<br>Xanthochromia (CSF) |
| | Avoid transport by Pod (PTS) | Xanthochromia (CSF) |
| | On ice,<br>rush to lab | Ammonia, calcitonin, gut hormones, insulin, C-peptide, ACTH, PTHrP, Plasma metanephrines |
| | 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)<br>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:

| | |
|---|---|
| City Hospital Birmingham | Birmingham B18 7QH |
| 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 |
| 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 |
| 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 |
| 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. The locations of Blood Gas Analysers are listed in POCT-LF-014-IMP.

# The Diagnostic Andrology (seminology) Service

**Opening hours**
The service is open from 09:30 – 13:00 each week-day (Excluding bank and NHS holidays) and operates on an appointments system only.

**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**
Reception: 020 3313 4680
Email: imperial.andrology.queries@nhs.net

The department has a 2 week turn around time for release of its results, 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. Any requests for clinical interpretation of results should be made to the clinical lead for the department via emailing channa.jayasena@nhs.net

**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 main reception desk.
If the sample is collected at home it must be brought to the laboratory within 30 minutes of it being produced. The date and time of collection must be clearly written on the sample pot & and must be accompanied by a completed request form. If samples are not analysed within 60 minutes results will be reported with a comment that indicates extended period between ejaculation and analysis.

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 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.

At West Middlesex University Hospital the Haematology and Blood Transfusion laboratories are located on the 1st floor.

At Hillingdon Hospital the Haematology and Blood Transfusion laboratories are located on the 1st floor.

## DESCRIPTION OF SERVICE

A full routine diagnostic service and out-of-hours emergency service is provided from the Haematology laboratory at all 6 hospitals, including full blood count, clotting factors and blood transfusion.

## KEY PERSONNEL/CONTACT NUMBERS

North West London Pathology Haematology Clinical Leads - Dr Andrew Godfrey and Dr Sasha Marks

| | TEL.NO. | BLEEP |
|---|---|---|
| **St Mary's Hospital** | | |
| ENQUIRIES | 21157 (BT), 21130 (Haem) | |
| RESULTS ENQUIRIES | 35353 (9am –5pm) | |
| URGENT REQUESTS | 21764 or individual lab number | |
| MAIN HAEMATOLOGY LAB | 21130 | |
| COAGULATION LAB | 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 | |

| **Chelsea and Westminster Hospital** | |
|---|---|
| CW Switchboard | 0203 315 8000 |
| RESULTS ENQUIRIES | 0203 313 5353 (call centre) |
| URGENT REQUESTS | bleep 0360 |
| HAEMATOLOGY LAB | 55206 |
| COAGULATION | 58213 |
| BLOOD TRANSFUSION | 58214 |
| MICROSCOPY | 58205 |

| **West Middlesex University Hospital** | **TEL.NO.** | **BLEEP** |
|---|---|---|
| WMUH Switchboard | 0208 560 2121 | |
| RESULTS ENQUIRIES | 0203 313 5353 (call centre) | |
| URGENT REQUESTS (OOH) | 238 | |
| MAIN LAB | 0208 321 5991 | |
| BLOOD TRANSFUSION | 0208 321 5515 | |

| **The Hillingdon Hospital** | **TEL.NO.** | **BLEEP** |
|---|---|---|
| THH Switchboard | 01895 238 282 | |
| RESULTS ENQUIRIES | 0203 313 5353 (call centre) | |
| URGENT REQUESTS (OOH) | 5627 | |
| MAIN LAB | 01985 279 292 | |
| BLOOD TRANSFUSION | 01895 279 293 | |

**Clinical advice and Interpretation (CXH, HH and SMH)**
During routine hours (09.00-17.30h, 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 |
| Paediatric Haematology (SMH) | 2261 or 2262 |

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).

**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.

**Clinical advice and Interpretation The Hillingdon Hospital (THH)**

| | |
|---|---|
| Dr Alex Holyome | 07852965460 |
| Dr Richard Hinton | 07931771088 |
| Dr Aushna Rasool | 07471169328 |
| Dr Mohammed Nakib Amin | 07735652674 |
| Dr Racheal Medland | 07710571043 |

Haematology SPR and or, Haematology Consultant via Hillingdon Hospital Switchboard
**Phone:** 01895 238282

**Clinical advice and Interpretation West Middlesex University Hospital (WMUH)**

| | | |
|---|---|---|
| Haematology | Dr Magda Alobaidi | 020 8746 8000 Ext 6425 |
| Coagulation | Dr Natasha Wiles | 020 8746 8000 |
| Blood Transfusion | Dr Anastasia Chew | 020 3315 8000 Ext 5854 |

| **CONSULTANTS** | **TEL.NO.** | |
|---|---|---|
| Dr Fateha Chowdhury (Blood Transfusion SMH) | 33234/31320 | 07659593374 |
| Dr Godfrey (CWH) | 58203 | |
| Dr Laffan (ICH) | 32178/31320 | Bleep: 5134 |
| Dr Layton (ICH) | 22391/32173/31320 | Bleep: 4080 |
| Dr Marks (ICH) | 31509 | |
| Dr Yee Hui (Blood Transfusion HH & CXH) | 02083831320 | |
| Dr Natasha Wiles | 020 8746 8000 | |
| Dr Richard Kaczmarski (RSK)(THH) | 07768 582508 | |
| Dr Ketan Patel (KCP)(THH) | 07776 067124 | |
| Dr Taku Sugai (TS)(THH) | 07540 700287 | |
| Dr Akila Danga (AD)(THH) | 07961 199382 | |
| Dr Ruby Haji (RH)(THH) | 07904 977124 | |
| Dr Magda Alobaidi (WMUH) | 020 8746 8000 Ext 6425 | |
| Dr Anastasia Chew (WMUH) | 020 3315 8000 Ext 5854 | |

| **DIVISIONAL MANAGEMENT TEAM** | **TEL.NO.** |
|---|---|
| Divisional Manager, Blood Sciences | |
| Rachel Tunstall | 17846 |
| Deputy Divisional managers, Blood Sciences | |
| Sreekanth Talluri, Deputy Divisional Manager (CWH, THH and WMUH) | 21039 |
| Mr Mike Lyall, Deputy Divisional Manager, MDAL, CXH | 15142 |

**QUALITY & GOVERNANCE MANAGER**
Gillian Lynam

**LABORATORY MANAGEMENT**
**Chelsea and Westminster**

| | | |
|---|---|---|
| Mr Dunstan Vincent | Blood Sciences Site Manager | 58094 |
| Mr Dunstan Vincent | Blood Transfusion | 55155 |
| Mr Naved Kazi | Haematology & Coagulation | 21130 |

**Charing Cross**

| | | |
|---|---|---|
| Mr Matt Kent | Haematology & Coagulation | 17116 |
| Ms Linda Chapple | Blood Transfusion | 17128 |

**Hammersmith**

| | | |
|---|---|---|
| Mr Andrew Osei-Bimpong | Blood Sciences Site Manager | 31946 |
| Ms Amanda Hann | Special & Routine Haematology | 32448 |
| Mr Saravanan Vinayagam | Special & Routine Coagulation | 32449 |
| Mr Athif Rahman | Blood Transfusion | 34774 |

**St Mary's**

| | | |
|---|---|---|
| Mr Dan Pelling | Blood Sciences Site Manager | 21039 |
| Mr David Johnson | Blood Transfusion | 22203 |
| Mrs Amanda Hann | Trust Lead Special Haematology | 22203 |

**The Hillingdon Hospital**

| | | |
|---|---|---|
| Mrs Linda Wildridge | Blood Sciences Site Manager | 01895238282 EXT 2237 |
| Mr Tawe Hove | Blood Transfusion | 293 |

**West Middlesex University Hospital**

| | | |
|---|---|---|
| Mrs Jyoti Panaser | Blood Sciences Site Manager | 01895238282 EXT 2237 |
| Mrs Mfon Anwana | Blood Transfusion | 0208 321 6947 |

**Chelsea & Westminster Hospital Transfusion Practitioner Team**

| | |
|---|---|
| Ms Jan Gordon | 0193 |
| Mrs Gillian Rattenbury | 0193 |

**Imperial Transfusion Practitioner Team**

| | |
|---|---|
| Transfusion Practitioners Team | Bleep: 5626/2033/9237 |

**West Middlesex University Hospital Transfusion Practitioner Team**

| | |
|---|---|
| Mrs Monique Chituku | 6787 |
| Mrs Charmaine Jardiel | 6920 |

**The Hillingdon Hospital Transfusion Practitioner**

| | |
|---|---|
| Mr Randy Amistad | Bleep: 5758 Extn: 2860 |

| **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 |
| The Hillingdon Hospital | 5627 |
| West Middlesex University Hospital | 238 |

## 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 – 9:00 – 20:00h (SMH) core tests only. Specimens must be received by 11am.
Saturday& Sunday –9:00-17:30h (CWH, CXH, HH, SMH, THH and WMUH) 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.

NB: Please note that when ordering haematology tests via Cerner no request form is generated. Blood Transfusion requests always generate a request form and must be sent with samples to the laboratory.

## 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.
- HITT Screen requests must be approved by the Haematology Registrar and must be accompanied by a completed HITT Request Form
- 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.
- Platelet Aggregometry must be pre-arranged with the coagulation laboratory
- All the above tests/screens must not be transported to the laboratory in the pneumatic tube system and must not be delayed in their delivery to the laboratory

## 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) or DOACs 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.*

*In the case of planned surgeries/procedures in which results are extremely time sensitive (and may lead to delay/cancellation if not returned within the agreed TAT) please notify the relevant haematology/blood transfusion laboratory via telephone so that samples can be located and priority can be given to the requested test. If hand delivered to the laboratory, please request BMS presence at the specimen reception hatch to ensure immediate delivery to the laboratory. If urgent samples have not been reported within the hour, please contact the laboratory urgently.*

**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)
- FVIII, FIX and FXI
- Anti-Xa for patients on UFH

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 and will be available on Cerner.

**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, CRITICAL DECISION VALUES AND TURNAROUND TIMES

| TEST | CONTAINER | VOLUME | Turnaround Time | COMMENT | Add on time limit |
|---|---|---|---|---|---|
| Full Blood Count | EDTA (purple) | 4ml | Routine 4 hours<br>=========<br>Urgent 1 hour | 4ml FBC includes an automated differential. A manual film will only be done if requested or indicated. | <24 hrs. |

| TEST | CONTAINER | VOLUME | Turnaround Time | COMMENT | Add on time limit |
|---|---|---|---|---|---|
| | | | | | |
| 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 spoke sites, 3 days MDAL |
| Infectious Mononucleosis | 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 72 hours 3 working days<br><br>Urgent same day (lab must be informed of sample) | Can be performed on the same sample as FBC. Ethnic origin essential. | 5 days spoke sites, 3 days MDAL |
| 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 ========= Urgent 2 hours | If sending for bothe FBC & ESR ensure tube is filled correctly | Only CW & CX – 8hrs |
| 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 spoke sites, 3 days MDAL |
| Pyruvate kinase Assay, Quantitation of Glutathione and GSH Stability. | EDTA (purple) or ACD | 4ml Adult or 2ml Paediatric | Routine within 21 days if sample is stored at 25ºC | External samples must include a travel control, FBC, blood film and Retic count | HH 5 days at 25ºC or 21 days at 4ºC |

| TEST | CONTAINER | VOLUME | Turnaround Time | COMMENT | Add on time limit |
|---|---|---|---|---|---|
| Glucose phosphate isomerase Assay | EDTA (purple) or ACD | 4ml Adult or 2ml Paediatric 4ml | Routine within 21 days if sample is stored at 25ºC | External samples must include a travel control, FBC, blood film and Retic count | HH 5 days at 25ºC or 21 days at 4ºC |
| Hexokinase assay | EDTA (purple) or ACD | 4ml Adult or 2ml Paediatric 4ml | Routine within 21 days if sample is stored at 25ºC | External samples must include a travel control, FBC, blood film and Retic count | HH 5 days at 25ºC or 21 days at 4ºC |
| Met-haemoglobin reductase, Assay, | EDTA (purple) or ACD | 4ml Adult or 2ml Paediatric 4ml | Routine within 21 days if sample is stored at 25ºC | External samples must include a travel control, FBC, blood film and Retic count | HH 5 days at 25ºC or 21 days at 4ºC |
| Glutathione peroxidase Assay, | EDTA (purple) or ACD | 4ml Adult or 2ml Paediatric 4ml | Routine within 21 days if sample is stored at 25ºC | External samples must include a travel control, FBC, blood film and Retic count | HH 5 days at 25ºC or 21 days at 4ºC |
| Quantitation of Glutathione and GSH Stability. | EDTA (purple) or ACd | 4ml | Routine within 21 days if sample is stored at 25ºC | External samples must include a travel control, FBC, blood film and Retic count | HH 5 days at 25ºC or 21 days at 4ºC |
| Pyrimidine 5 Nucleotidase Screen | EDTA, Heparin or ACD | 4ml | <24 hours | External samples must include a travel control, FBC, blood film and Retic count | Fresh samples with prior arrangement |
| Heinz Bodies | EDTA (purple) | 4ml | 48 hours | | 48 hrs |
| Heat instability /isopropanol precipitation test | EDTA or any other anti-coagulated blood | 4ml | 24 hours | External samples must include a travel control, FBC, blood film and Retic count | 24 hrs |
| Osmotic Fragility | Lithium Heparin | 2 x 6 ml | 24 hours | Samples must be sent with a normal control | Fresh samples with prior arrangement |
| Dye Binding | EDTA (purple) | 4ml | 48 hours | External samples must include a travel control, FBC, blood film and Retic count | </= 48 hrs stored at 4ºC |
| Urinary haemosiderin | Universal container | 10ml | Routine 5 days ========= Urgent N/A | Early morning urine | N/A |
| Prothrombin time | Citrate (blue) | 2.7ml | Routine 4 hours ========= | Underfilled/Overfilled bottles cannot be | 4 hrs |

| TEST | CONTAINER | VOLUME | Turnaround Time | COMMENT | Add on time limit |
|---|---|---|---|---|---|
| | | | Urgent 1 hour | accepted as results are inaccurate. | |
| INR (warfarin control) | Citrate (blue) | 2.7ml | Routine 4 hours<br>=========<br>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<br><br>APTTR (Heparin ratio) | Citrate (blue) | 2.7ml | Routine 4 hours<br>=========<br>Urgent 1 hour | Underfilled/Overfilled bottles cannot be accepted, as results are inaccurate. | 4 hrs for APTT.<br><br>For APTTR see INR above) |
| Thrombin time | Citrate (blue) | 2.7ml | Routine 4 hours<br>=========<br>Urgent 1 hour | Underfilled/Overfilled bottles cannot be accepted, as results are inaccurate. | 4 hrs |
| Coagulation screen:<br>(PT, APTT, Fibrinogen and INR) | Citrate (blue) | 2.7ml | Routine 4 hours<br>=========<br>Urgent 1 hour | Underfilled/Overfilled bottles cannot be accepted, as results are inaccurate. | 4 hrs. |
| D-Dimer | Citrate (blue) | 2.7ml | Routine 4 hours<br>=========<br>Urgent 1 hour | Underfilled/Overfilled bottles cannot be accepted as results are inaccurate. | 4 hrs. |
| Lupus anticoagulant | Citrate | 3 x 2.7ml citrate | 14 days | Must be approved by a Haematology registrar | 4 hrs. post draw (1 month if frozen) |
| Thrombophilia Screen | Citrate | 4 x 2.7 ml citrate | 14 days | Must be approved by a Haematology registrar | 4 hrs. post draw (1 month if frozen) |
| Protein C Activity / Antigen | Citrate | 2.7ml | 14 days | Must be approved by Haematology Registrar | 4 hrs. post draw (1 month if frozen) |
| Antithrombin Activity / Antigen | Citrate | 2.7ml | 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 |
|---|---|---|---|---|---|
| Free Protein S Antigen | Citrate | 2.7ml | 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 | 2.7ml | 14 days | Must be approved by Haematology Registrar | 4 hrs. post draw (1 month if frozen) |
| vWF Ag & vWF Ricof | Citrate | 3 x 2.7ml | 14 days | Must be approved by Haematology Registrar | 4 hrs. post draw (1 month if frozen) |
| Collagen Binding Assay | Citrate | 2.7ml | 14 days | Must be approved by Haematology Registrar | 4 hrs. post draw (1 month if frozen) |
| Platelet Function Assay | Citrate | 2.7ml | 4 hours | Must be approved by Haematology Registrar | N/A |
| Platelet Aggregation | Citrate | 2.7ml (6-8 samples) | 4 hours | Must be approved by Haematology Registrar and pre-arranged with the laboratory | N/A |
| Inhibitor Screen | Citrate | 2.7ml | 14 days | Must be approved by Haematology Registrar | 4 hrs. post draw (1 month if frozen) |
| Inhibitor Assay | Citrate | 2.7ml | 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 |
|---|---|---|---|---|---|
| Heparin induced thrombocytopenia Screen | Citrate | 2.7ml | Routine 4 hours | Must be approved by Haematology Registrar<br><br>**Please note:** HITT screen requests no longer have to be accompanied by a scoring form. The 4T score can be looked up on Cerner. | 2 hrs |
| Heparin induced thrombocytopenia Quantitation | Citrate | 2.7ml | Routine 24 hours<br><br>(Monday to Friday routine hours only) | Must be approved by Haematology Registrar | 2 hrs |
| Heparin dose monitoring (LMWH or UFH) | Citrate | 2.7ml | 4 hours | | 4 hrs. |
| Rivaroxaban, Apixaban, Fondaparinux, Dabigatran monitoring | Citrate | 2.7ml | 4 hours | | 4 hrs. |
| Test referred to external laboratories | | | | | |
| vWF Multimers | Contact laboratory for more information | | | | |
| ADAMTS13 | Contact laboratory for more information | | | | |
| Platelet nucleotides | 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** |
| Baby Group & IgG (0-120 days old) | EDTA (pink) | 1 mL | Routine 4 hours, Urgent 45 min | This is a different bottle to the FBC on no account will it be shared | N/A |
| Group & Antibody Screen (>120 days old) | EDTA (pink) | 4mL or 6mL | Routine 4 hours, Urgent 45 min (Excludes Positive antibody screens) | This is a different bottle to the FBC on no account will it be shared | N/A |
| Cross match | EDTA (pink) | 6ml<br>4ml for paediatric patients<br>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 |
| Cell Free Foetal DNA | EDTA (pink) | 6mL | 7 business days from receipt at IBGRL* | Sample sent to International Blood Group Reference Laboratory<br><br>The Molecular Diagnostics department aims to report 98% of samples within 10 business days of receiving the sample. Customers will be informed by email or phone in the unlikely event that a delay is anticipated.<br><br>(https://ibgrl.blood.co.uk/services/molecular-diagnostics/fetal-rhd-screen/) | N/A |
| 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 |
| HCT (Ratio) (L/L) | 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) (L/L) | 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 – 12 years | 200-450 |

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). Ranges applicable to XE, XT and Abbott hq analytical platfoms

## 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) |
| | 0-23 (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

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 16 years old

| Test | Reference Range | Reportable Unit |
|---|---|---|
| Prothrombin Time (PT) | 12.8 - 17.4 | Seconds |
| International Normalized Ratio (INR) | Use Therapeutic Ranges | |
| Activated Partial Thromboplastin Time (APTT) | 23.9- 35.5 | Seconds |
| Activated Partial Thromboplastin Time Ratio (APTR) | Use Therapeutic Ranges | |
| Fibrinogen | 1.9 – 4.3 | g/L |
| Thrombin Time | 14.4 – 18.4 | Seconds |
| D-Dimer | <500 | Fibrin Equivelent Units (FEU) |
| Factor 2 (II) Assay | 0.78 – 1.38 | IU/mL |
| Factor 5 (V) Assay | 0.78 – 1.52 | IU/mL |
| Factor 7 (VII) Assay | 0.61 – 1.99 | IU/mL |
| Factor 8 (VIII) Assay | 0.52 – 2.90 | IU/mL |
| Factor 9 (IX) Assay | 0.59 - 2.54 | IU/mL |
| Factor 10 (X) Assay | 0.96 - 1.71 | IU/mL |
| Factor 11 (XI) Assay | 0.67 – 1.96 | IU/mL |
| Factor 12 (XII) Assay | 0.38 – 1.89 | IU/mL |
| Factor 13 (XIII) Assay | 0.64 – 1.76 | IU/mL |
| Heparin Assay (Anti Xa) | Use Therapeutic/Prophylactic Ranges | |
| HITT Quantitation | Positive = > 1.00 is highly suggestive of HIT | U/mL |
| Antithrombin Activity Assay | 0.80 – 1.20 | IU/mL |
| Antithrombin Antigen Assay | 0.79 – 1.11 | IU/mL |
| Protein C Activity Assay | 0.74-1.64 | IU/mL |
| Protein C Antigen Assay | 0.70 – 1.40 | IU/mL |
| Protein S Free Antigen Assay | 0.74 – 1.20 | IU/mL |
| von Willebrand Factor Antigen Assay | 0.45 – 1.80 | IU/mL |
| von Willebrand Factor Activity Assay (RICOF) | 0.45 – 1.80 | 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 | 1.9 – 4.3 | g/L |

Note: The reference ranges for use on patients over the age of 16 years, has been locally verified through evaluation on representative normal individuals across the sites to reflect our patient population.

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 16 years of age have been taken from published data, from a research study using comparable methodology and equipment as that currently employed in our organisation. Please contact the laboratory for coagulation paediatric ranges.

**Communication of Haematology results. Critical Decision values:**

Results falling into this category are to be telephoned to the relevant clinician/GP/Consultant

| Test | All sites (Including GP samples) |
|---|---|
| Hb (new/unexpected) | <70 |
| Hb (new/unexpected) | >200 |
| Hb | unexpected drop of >30g/l |
| Neutrophils | < 0.5 where new/unexpected |
| Neutrophils | > 30.0 where new/unexpected |
| Lymphocytes | NA |
| Platelets | <50 where new/unexpected |
| Platelets | >1000 where new/unexpected |
| IMST | All positive results |
| Malaria | All first time positive results including RDT to ID consultant |
| Sickle Screen | All results whether positive or negative if requested as urgent. |
| ESR | >40 If ? Temporal Arteritis |
| PT | >23.5 |
| INR | >5.0 |
| APTT | >40.0<br>≥ 50 to haem/coag registrar |
| APTTR | >2.5 |
| Fibrinogen | <1.0 |
| G6PD | If deficient |
| Factor Assays | All abnormal levels |

## 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<br>St Thomas' Hospital, Lambeth Palace Rd, London, SE1 7EH |
| Haemophilia Reference Centre<br>Royal Free Hospital, Pond Street, London, NW3 2QG |
| Red Cell Reference<br>NHSBT Colindale, Charcot Road, Colindale, London NW9 5BG |
| H&I<br>NHSBT Colindale, Charcot Road, London NW9 5BG |
| IBGRL<br>NHSBT Bristol, 500 North Bristol Park, Northway, Filton, Bristol, BS34 7QH |
| Red Cell Reference<br>NHSBT Bristol, 500 North Bristol Park, Northway, Filton, Bristol, BS34 7QH |
| H&I<br>NHSBT Bristol, 500 North Bristol Park, Northway, Filton, Bristol, BS34 7QH |
| Haematology<br>Great Ormond Street Hospital, Great Ormond St, London WC1N 3JH |
| Haematology, St Thomas' Hospital, Lambeth Palace Rd, London, SE1 7EH |
| National Haemoglobinopathy Reference Laboratory<br>Molecular Haematology Level 4, John Radcliffe Hospital, Oxford 0X3 9DU. |
| Haematology- Central Middlesex Hospital<br>Acton Lane, Park Royal NW10 7NS |
| Special Haematology- Kings College Hospital<br>Denmark Hill, London SE5 9RS |
| The Royal Marsden Hospital, Section of Haemato-Oncology, Brookes Lawley Building<br>Cotswold Road, Sutton Surrey SM2 5NG |
| N.W. Thames Regional Genetics Centre<br>Northwick Park Hospital, Watford Road, Harrow, Middlesex, HA1 3UJ |
| The Bone Marrow Laboratory CameliaBotnar Laboratories<br>Great Ormond Street Hospital, Great Ormond St, London WC1N 3JH |
| London School of Hygiene and Tropical Medicine<br>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) |
| Department of Medicine, University College London, Rayne Building, University Street, London, WC1E 6JF (Intracellular Cation (& Flux) Studies) |
| Wessex Regional Genetics Laboratory – Salisbury District Hospital<br>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.
- Ask the patient to positively identify themselves against the label for Group & Save against the written label on the blood bottle.

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 11.00 on 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. (Form in Blood Transfusion on Intranet)
- 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.
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 and competency, 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 Trusts' 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 is responsible for the operational management and safe delivery of the service. The POCT Manager is supported by five POCT Site Leads.

| Position | Name& Email | Tel No | Bleep |
|---|---|---|---|
| POCT Specialty Lead | Prof. Tricia Tan<br>tricia.tan@nhs.net | 020 838 38038/ 33380 | - |
| POCT Manager | Gareth John<br>gareth.john4@nhs.net | 020 331 17077 | - |
| POCT Lead, St. Mary's (Blood Sciences) | Somia Janjua<br><br>Somia.janjua@nhs.net | 020 331 21320 | 1021 (09:00-17:30)<br>1022 (17:30-09:00) |
| POCT Lead, Charing Cross (Blood Sciences) | Sultana Hoque<br>Sultana.hoque@nhs.net | 020 331 17077 | (mob) 07342 062382 |
| POCT Lead, Hammersmith (Blood Sciences) | Vacant | 020 331 32446 | (mob) 07342 062470 |
| POCT Lead, Chelsea and Westminster (Blood Sciences) | George Yartey<br>gyartey@nhs.net | 020 331 55135 | 0143 |
| POCT Lead (Infection and Immunity) | Hitesh Mistry<br>hitesh.mistry2@nhs.net | 020 331 10173 | - |
| POCT team | imperial.nwlp.poct@nhs.net | | |

## ROUTINE SUPPORT

Routine hours – 09:00-17:30* Monday to Friday
*core hours are 09-15:30 please contact site POCT lead to confirm.

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 – 020 331 23752 or bleep 1022 |
| Charing Cross Hospital | Duty BMS – 020 331 17004 or bleep 8161 |
| Hammersmith Hospital | Duty BMS – 020 331 32113 or bleep 9022 |
| Chelsea and Westminster Hospital | Duty BMS – 020 331 55133 or bleep 0143 |
| West Middlesex University Hospital | Duty BMS – 0208 321 5930 or bleep 337 |
| The Hillingdon Hospital | Duty BMS – 01895 279288 or bleep 5602 |

## GENERAL ENQUIRIES

All general enquiries regarding POCT should be directed to the relevant POCT Site Lead (see Key Contacts above). Alternatively, please contact the POCT team email address imperial.nwlp.poct@nhs.net

## 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

## DESCRIPTION OF SERVICES

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

### Infection & Immunity Laboratory

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 cross-matching 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.

## DESCRIPTION OF SERVICE

The laboratory 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

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 Arthi Anand as above.

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 UKAS and the H&I laboratory is also accredited through 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. The interim H&I Laboratory Director is Dr Peter Kelleher until recruitment to the post is completed.

| Site | Contact | Name | Tel No. | Other |
|---|---|---|---|---|
| Cross Site | Divisional Manager | Dr. Panos Pantelidis | 10230 / 10136 | 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 | |
| | Consultant Clinical Scientist | Dr. Mary Guckian | 10136 | |
| | Specialist Scientist | Dr. Alison Cox | 10141 / 10130 | |
| | Specialist Scientist | Graham Pickard | 10147 | |
| | Specialist Scientist I&I in Blood Sciences MDAL | Dipti Patel | 17063 | |
| | Infection and Immunity Sciences Governance & Quality Manager | Yvonne Iroadumba | 15175/10143 | |
| Hammersmith *(H&I)* | H&I Consultant Clinical Scientist, Lab Director | Dr Arthi Anand | 37139 | |
| | Specialist Scientist | Eva Santos | 33226 | |
| | Specialist Scientist | Rachel Smith | 38211 | |

## 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 10134, 10135,10138, 10139, 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$^{o}$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$^{o}$C. Please see comments under specific Immunology test heading below and in the table of Virology tests repertoire for any additional requirements

**For IDPS samples** whole blood specimens are collected into Rust top gel tube and sent to the department by the internal or external transport systems in UN 3373 box. These samples follow same transport processes as routine samples. If specimens are not transported to the laboratory immediately after collection they should be stored at 4-8 o C. Specimens may be received outside of normal working hours for pregnant women who have presented in labour and require urgent IDPS screening to be carried out which can be arranged by discussing with on call Consultant Virologist.

## URGENT REQUESTS AND RESULTS

Please contact Dr. Alison Cox (10130 / 10141) at the centralised immunology laboratory to discuss requirements for urgent Immunology samples or for the H&I Hammersmith laboratory, Dr. Arthi Anand (37139) 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.

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.
If there is a requirement for the laboratory team to phone an urgent result, this must be clarified at the time of the call and contact details given 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 emailed using nhs.net account to encrypted email address.

**ON-CALL / OUT OF HOURS SERVICE FOR VIROLOGY including IDPS**
Out of hours service for Virology is by special arrangement with the Consultant Virologist. Discuss case with duty Consultant Virologist who will provide a contact number for the Virology lab performing the tests.

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 Arthi Anand and from Dr David Muir for Virology.

Refer to INIS-LP-175-H -Consultant Cover and Contingency Plan(s) for H&I Services (Immunology) Laboratory at Hammersmith Hospital for current practice.

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(10130)
In cases where there are encapsulated organisms such as Haemophilus influenzae (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.

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 (10130) to arrange C1 inhibitor testing.

## SUGGESTED PROFILES FOR IMMUNOLOGY - Immune Deficiency

| | |
|---|---|
| HIV Infection Monitoring | T cell subsets (CD3 / CD4 / CD8) * |
| Antibody Deficiency | IgG, IgA and IgM [Chemical Pathology Test]<br>Serum protein electrophoresis [Chemical Pathology Test]<br>Vaccine-specific antibodies (Tetanus, Hib, Pneumococcal) |
| Hereditary Angioedema<br>(C1 inhibitor deficiency) | C3 and C4<br>C1 inhibitor (antigenic and functional) ** [only, if C4 low] |
| Other Complement Deficiencies<br>(e.g. C1q, C2, C5-C9) | C3 and C4<br>CH50 *** and AP50 ***<br>Individual complement proteins (e.g. C1q, C2, C5-9) can be measured if the CH50 and/or AP50 results are abnormal |
| Other Immunodeficiencies<br><br>Direct Request | Investigations for possible defects of: : B cell memory/T cell memory, Antibodies, T cells, Phagocytes, Complement, IL12-IFN gamma pathway etc<br>- 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 dermatititis herpetiformis. 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 PROFILES IMMUNOLOGY - Autoimmune / Connective tissue Disorders

| | |
|---|---|
| Rheumatoid Arthritis | Rheumatoid Factor<br>CCP |
| Connective Tissue Diseases (SLE, Sjogrens, MCTD etc) | C3 and C4<br>Rheumatoid Factor<br>Anti nuclear antibodies<br>ds DNA antibodies<br>ENA antibodies |
| Vasculitis | C3 and C4<br>Rheumatoid Factor<br>Anti nuclear antibodies<br>Anti neutrophil cytoplasmic antibodies |
| Liver Autoimmunity | Anti nuclear antibodies<br>Mitochondrial antibodies<br>Smooth muscle antibodies<br>Liver-Kidney-Microsomal Antibodies |
| Renal Autoimmunity | C3 and C4 [Chemical Pathology test]<br>Anti nuclear antibodies<br>Anti neutrophil cytoplasmic antibodies<br>Glomerular Basement Membrane antibodies<br>C3 Nephritic factor where indicated |
| Coeliac disease | Tissuetransglutaminase (IgA)<br>Total IgA |
| Thyroid disease | Thyroid peroxidase antibodies<br>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<br>Grass Pollen (Timothy Grass)<br>Mixed Trees (Box-elder, Silver Birch, Hazel, Oak, London Plane)<br>Cat dander<br>Dog dander<br>Aspergillusfumigatus |
| Common foods | Peanuts (ground nuts)<br>Fish (cod)<br>Milk<br>Egg<br>Wheat |
| Insect Venom | Bee<br>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)
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
4ml blood in EDTA (purple top). Buccal swabs can be accepted in situations where EDTA blood cannot be obtained.
HLA typing is carried out at high resolution using Next Generation Sequencing (NGS) for HLA -A, -B and -C, for renal and haematology patients and their respective donors, in addition to looking at disease association.

HLA CLASS II TYPING
HLA 2
4ml blood in EDTA (purple top). Buccal swabs can be accepted in situations where EDTA blood cannot be obtained.
HLA typing is carried out at high resolution using Next Generation Sequencing (NGS) for HLA -DR, -DQ and –DPB1, for renal and haematology patients and their respective donors, in addition to looking at disease association.

HLA-DQA1/ DQB1 and HLA-DRB345 typing is performed by PCR-SSOP method using Luminex Technology for renal patients and donors.
HLA class I and II typing using Linksēq technology is required for HLA typing of deceased donors in support of the ODT deceased donor programme for solid organ transplantation.

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 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
4ml 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
4ml 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
40 ml EDTA blood (purple top) from donor
4 ml EDTA blood (purple top) + 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 dependent 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 including IDPS samples, 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 including IDPS samples cannot be transported to the laboratory the same day, they should be stored at +4$^{o}$C - +8$^{o}$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. |
| 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.<br>• For component resolved diagnostics testing 1 mL per allergen is required.<br>• 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 |
| 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. |
| Beta 2-glycoprotein 1 IgG antibodies | 1 mL Serum | 5ml GEL SST (Rust Top) | <20 GPL U/mL | days | |

| Test | Sample type | Container | Ref Ranges | Turnaround time | Additional requirements and other comments |
|---|---|---|---|---|---|
| Beta 2-glycoprotein 1 IgM antibodies | 1 mL Serum | 5ml GEL SST (Rust Top) | < 20 MPL U/mL | days | |
| Cardiac muscle antibodies | 1 mL Serum | 5ml GEL SST (Rust Top) | Negative | 28 days | Not currently performed in house; this test is referred. |
| Cardiolipin IgG antibodies | 1 mL Serum | 5ml GEL SST (Rust Top) | < 20 GPL U/mL | 7 days | |
| Cardiolipin IgM antibodies | 1 mL Serum | 5ml GEL SST (Rust Top) | < 20 MPL U/mL | 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 | |

| Test | Sample type | Container | Ref Ranges | Turnaround time | Additional requirements and other comments |
|---|---|---|---|---|---|
| Complement C3 nephritic factor | 1 mL Serum | 5ml GEL SST (Rust Top) | Negative | 28 days | Not currently performed in house; this test is referred. 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 | This test is no longer performed at NWLP.<br><br>All requests for complement genetics tests must be accompanied by a fully completed GOSH genetic referral form for onward transport.<br><br>Please contact Great Ormond Street Hospital directly for further information/request form as required<br><br>If samples are not accompanied by fully completed form – the sample will be discarded' |
| 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 | 4 days | |
| DNA double stranded antibodies, quantitative | 1 mL Serum | 5ml GEL SST (Rust Top) | Negative < 4IU/mL<br>Borderline 5 – 9 IU/mL<br>Positive >10 IU/ml | 10 days | |
| Encephalitis Antibodies (VGK, LG1, CASPR2, NMDA, DPPX, AMPA1/2, GABA B) | 1 mL serum | 5ml GEL SST (Rust Top) | Negative | 28 days | Samples are referred to Birmingham hospital. This test detects antibodies to a panel of neuronal cell surface antigens including the glutamate receptors NMDA-Rand |

| Test | Sample type | Container | Ref Ranges | Turnaround time | Additional requirements and other comments |
|---|---|---|---|---|---|
| | | | | | AMPA1/2, GABAB receptors, DPPX and the voltage gated potassium channel VGKC-associated proteins LGI1 and CASPR2. Antibodies should be measured in CSF and serum. Any positive serum result should always be confirmed in CSF to reduce the risk of misdiagnosis. |
| 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. |
| Extractable nuclear (ENA) antibodies | 1 mL Serum | 5ml GEL SST (Rust Top) | Negative | 10 days screen (14 days specificities) | ENA now includes Ro52, Ro60, and SS-B. Sm, SmRNP, RNP-A, RNP-68, Scl-70, Jo-1, ribosomal P, and centromere B. |
| Factor H and factor I | 1 mL Serum | 5ml GEL SST (Rust Top) | Antigenically present | 28 days | Not currently performed in house; this test is referred. |
| 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. |

| Test | Sample type | Container | Ref Ranges | Turnaround time | Additional requirements and other comments |
|---|---|---|---|---|---|
| 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<br>7 – 10 U/mL = Equivocal<br>>10 U/mL = Positive | 5 days | |
| Haemophilus antibodies | 1 mL Serum | 5ml GEL SST (Rust Top) | 0.15 mg/L (minimum protective level)<br>1 mg/L (optimum protective level) | 28 days | Not currently performed in house this test is referred. |
| Histone antibodies | 1 mL Serum | 5ml GEL SST (Rust Top) | Negative | 28 days | Not currently performed in house; this test is referred. |
| IA2 antibody ELISA *(Tyrosine Phosphatase / Insulinoma-associated Antigen 2)* | 1 mL Serum | 5ml GEL SST (Rust Top) | <10 IU/ml | 14 days | Transported at room temperature. Once serum has been extracted, sample is stored at 4-6oC |
| Immunoglobulin-g subclasses (IgG1-4) | 1 mL Serum | 5ml GEL SST (Rust Top) | Age related. See additional comments field. | 14 days | Reference Range<br>Adults<br>IgG 1 : 3.2-10.2 g/L<br>IgG 2 : 1.2-6.6 g/L<br>IgG 3 : 0.2-1.9 g/L<br>IgG 4 : 0-1.3 g/L<br>Please note, values for children vary according to age<br>. |

| Test | Sample type | Container | Ref Ranges | Turnaround time | Additional requirements and other comments |
|---|---|---|---|---|---|
| Insulin antibodies | 1 mL Serum | 5ml GEL SST (Rust Top) | Negative | 28 days | Not currently performed in house; this test is referred. |
| 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 | No longer performed |
| 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] |
| 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) | |
| 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 |

| Test | Sample type | Container | Ref Ranges | Turnaround time | Additional requirements and other comments |
|---|---|---|---|---|---|
| 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)<br><br>NB: values for children vary according to age | 3 days | Lymphocyte subpopulations Adults<br>CD3+ T lymphocytes % 55-83<br>CD3+ T lymphocytes Absolute 700-2100<br>CD3+/CD4+ T lymphocyte % 28-57<br>CD3+/CD4+ T lymphocyte Absolute 300-1400<br>CD3+/CD8+ T lymphocyte % 10-39<br>CD3+/CD8+ T lymphocyte Absolute 200-900<br>CD19+ B lymphocyte % 6-19<br>CD19+ B lymphocyte Absolute 100-500<br>CD3-/CD16-CD56+ NK cells % 7-31<br>CD3-/CD16-CD56+ NK cells Absolute 90-600<br>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. |
| 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. |
| 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. |

| Test | Sample type | Container | Ref Ranges | Turnaround time | Additional requirements and other comments |
|---|---|---|---|---|---|
| Myeloperoxidase antibodies | 1 mL Serum | 5ml GEL SST (Rust Top) | See addition al comment field | 5 days | Reference Range:<br><3.5 IU/mL = Neg<br>3.5 – 5 IU/mL= Equivocal<br>>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] |
| 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] |
| 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.<br>Children:5-10 mL whole blood | Adults:<br>10-20 mL Lithium heparin (green top)<br>Children:<br>5-10 mL heparin (green top) | See report | 7 days | Do not separate or refrigerate<br>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. |
| 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. |

| Test | Sample type | Container | Ref Ranges | Turnaround time | Additional requirements and other comments |
|---|---|---|---|---|---|
| Pneumococcal antibodies | 1 mL Serum | 5ml GEL SST (Rust Top) | See additional comments | 14 days | Adult reference value<br>Good level >39 U/ml<br><br>Paediatric reference value<br><br>*0-1 year Good level >14 U/ml<br>1-<2 years Good level >14 U/ml<br>2-<3 years Good level >19 U/ml<br>3-<4 years Good level >29 U/ml<br>4-<10 years Good level >44 U/ml<br>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<br>Weak Positive Range: ≥14 to <20 RU/ml<br>Positive Range: ≥20 RU/ml<br><br>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<br><br>Not currently performed in house; this test is referred. |
| PR3 antibodies | 1 mL Serum | 5ml GEL SST (Rust Top) | See additional information field | 5 days | <2 IU/mL = Neg<br>2 – 3 IU/mL = Equivocal<br>>3 IU/mL = Pos |
| 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.<br>Samples must be < 24 hours old on receipt in the lab |

| Test | Sample type | Container | Ref Ranges | Turnaround time | Additional requirements and other comments |
|---|---|---|---|---|---|
| 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. |
| Scl-70 antibodies (included in the ENA screen) | 1 mL Serum | 5ml GEL SST (Rust Top) | Negative | 5 days | See ENA screen |
| 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. |
| 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. |
| 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.<br>• For component resolved diagnostics testing 1 mL per allergen is required.<br>• See also Allergen Specific IgE |

| Test | Sample type | Container | Ref Ranges | Turnaround time | Additional requirements and other comments |
|---|---|---|---|---|---|
| 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) | 0 – 5 IU/mL | 7 days | |
| Thyroid stimulating hormone receptor (TSHR) antibodies | 1 mL Serum | 5ml GEL SST (Rust Top) | <0.4 U/L | 21 days | |
| Tissue transglutaminase IgA | 1 mL Serum | 5ml GEL SST (Rust Top) | < 15 U/mL | 7 days | Additional Confirmatory tests: turnaround time 14 days |
| Tissue transglutaminase IgG *(if IgA deficiency indicated)* | 1 mL Serum | 5ml GEL SST (Rust Top) | < 15 U/mL | 7 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, Vedolizumab VEDL) Perform venesection BEFORE next drug infusion |
| Serum Tryptase | Minimum 5ml. | 5ml GEL SST | 2 – 14µg/L | 14 days | See here |

| Test | Sample type | Container | Ref Ranges | Turnaround time | Additional requirements and other comments |
|---|---|---|---|---|---|
| | | ( Rust/Yellow top) | | | |
| 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)<br>Transportation at room temperature/ first class post is adequate. Storage at 4 degrees or -20 for long term<br>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 |
| 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. |
| Voltage gated potassium channel antibodies | 1 mL Serum | 5ml GEL SST (Rust Top) | | 28 days | Test no longer available. Sample would be tested for LGI1 and CASPR 2 antibodies if requested and would be referred out. |

## 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 identification | 10 ml Serum | 10 mL clotted sample (Red top preferred),<br>SST (gold top) acceptable | N/A | Please consult the laboratory | • Samples must be sent via first class post or courier.<br>• It is important to record the sample date when requesting these tests.<br>• Please provide HIV and hepatitis B status.<br>• Results are held with the patient history, and are not routinely reported for individual samples |
| HLA crossmatch (wet crossmatch) | Donor sample: 40ml whole blood (EDTA)<br><br>Recipient Samples:<br><br>10 mL serum<br><br>+<br><br>4ml whole blood (EDTA) | Donor samples:<br>40ml EDTA (lavender top)<br><br>Recipient samples:<br>10 mL Clotted Sample (red top) + 4ml EDTA (lavender top) | Interpretive report provided | Please consult the laboratory | BOTH samples must be <24 hours old<br>The laboratory is accredited for the flow cytometry crossmatch test by the European Federation of Immunogenetics (EFI), however UKAS accreditation for the most recently acquired analyser is pending. |
| HLA typing | 4 mL Whole Blood | 4ml EDTA (lavender top | Interpretive report provided | 30 days | Renal/ pancreas patients and donors -30 days<br>HSCT patients and donors - 30 days<br>Disease association and HLA-B57 testing- 14 days<br>Samples must be sent via first class post or courier<br>HLA Typing is performed by various methods including Next Generation Sequencing, Luminex Technology and Linkseq Technology |
| HLA virtual Crossmatch assessment (living donor) | Donor samples: 4ml whole blood (EDTA)<br><br>Recipient samples: | Donor samples:<br>4mL EDTA (lavender top)<br><br>Recipient samples: | Interpretive report provided | Please consult the laboratory | |

| | | | | | |
|---|---|---|---|---|---|
| | 10 mL serum<br>+<br>4ml whole blood (EDTA) | 10 mL Clotted Sample (red top) + 4ml EDTA (lavender top) | | | |
| HLA-B*27 Typing | 4mL<br>Whole Blood | EDTA<br>(4ml purple / 6 ml pink top) | Negative | 14 days | Samples must be sent via first class post or courier |
| HLA-B*57:01 | 4mL<br>Whole Blood | EDTA<br>(4ml purple / 6 ml pink top) | Negative | 14 days | Samples must be sent via first class post or courier |

## 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 |
| Coronavirus | Refer to entry for SARS CoV-2 (COVID-19, novel coronavirus) | | | | |
| | | | | | |
| CMV IgG antibodies by EIA | Serum | 5 ml GEL SST (Rust Top) | Negative | 3 days | |
| 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. |

| Test | Sample type | Container | Ref Ranges | Turnaround time | Additional requirements and other comments |
|---|---|---|---|---|---|
| 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 | | | | See Virus Screen- gastroenteritis |
| 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 |
| 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 (including antenatal Hepatitis B serology) | Serum | 5 ml GEL SST (Rust Top) | Negative | 3 days (Confirmation: non-negatives up to 10 days) | Acute/Chronic Hepatitis B Infection. |

| Test | Sample type | Container | Ref Ranges | Turnaround time | Additional requirements and other comments |
|---|---|---|---|---|---|
| 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 Quantitative RNA (Hepatitis C viral load) | Whole Blood | 6 ml EDTA (Pink Top) | N/A | 7 days | 10 ml EDTA tubes also accepted |
| Hepatitis C Antibodies | Serum | 5 ml GEL SST (Rust Top) | Negative | 3 days | Screening test for antibodies to hepatitis C virus.<br>Hyperlink:<br>https://www.nwlpathology.nhs.uk/tests-database/hepatitis-c-virus-hcv-antibodies-by-eia/ |
| HCV Genotyping | EDTA whole blood | 6 ml EDTA (Pink Top) | N/A | 7 days | Not currently performed in house; this test is referred.<br>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. |
| Hepatitis E virus | Serum | 5 ml GEL SST (Rust Top) | Negative | 14 days | Positive serology for IgM and IgG, Current or Past Infection. |
| Hepatitis E virus Quantitative RNA (Hepatitis E viral load) | Whole Blood | 6 ml EDTA (Pink Top) | N/A | 3 days | Positive serology for IgM and IgG, Current or Past Infection. |
| Herpes simplex virus IgG | Serum | 5 ml GEL SST (Rust Top) | Negative | 7 days | |
| HIV 1/2 antibodies EIA (including antenatal HIV) | Serum/Saliva | 5 ml GEL SST (Rust Top) / 250ul Saliva Sponge | Negative | 3 days (Confirmation: non-negatives up to 10 days) | Screening test for HIV antibodies :<br>Please give detailed clinical information, including the date of onset/contact with the suspected infection. |
| HIV-1 Resistance (Integrase) | 10 ml Whole blood | 6 ml EDTA (Pink Top) | Contact Laboratory | 14 days | Must have quantifiable HIV-1 viral load.<br>10 ml EDTA tubes also accepted.<br>Sequencing previously performed externally now done in-house |

| Test | Sample type | Container | Ref Ranges | Turnaround time | Additional requirements and other comments |
|---|---|---|---|---|---|
| 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 | Not currently performed in house; this test is referred. |
| 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 |
| Genital Ulcer Pathogen Screen (GUDPCR) | Yellow top swabs | Cobas PCR media or viral transport media (VTM) | N/A | 5 days | Sample Transport/ storage- Room temperature. Minimum sample volume 400ul. |
| HTLV 1 and 2 antibodies by EIA | Serum | 5 ml GEL SST (Rust Top) | Negative | 3 days (Confirmation: non-negatives up to 10 days) | |
| Human herpesvirus 6 Quantitative DNA (HHV-6 viral load) | Whole Blood | 6 ml EDTA (Pink Top) | N/A | 3 days | Serology for IgM and IgG, Current or Past Infection. |
| 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. |

| Test | Sample type | Container | Ref Ranges | Turnaround time | Additional requirements and other comments |
|---|---|---|---|---|---|
| | | | | | |
| Measles virus IgM antibodies | Serum | RST (Rust top) 5 mL | See report | 5 days | Suspected measles.<br>ease give detailed clinical information, including date of nset/contact with the suspected infection. |
| 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 |
| Mpox PCR | Yellow top swabs | Cobas PCR media or viral transport media (VTM) | N/A | 3 days | Sample Transport/ storage- Room temperature.<br>Minimum sample volume 400ul. |
| 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, |
| Parvovirus IgG & IgM | Serum | 5ml GEL SST (Rust Top) | See report | 10 days | Recent/past infection<br>This test is performed in-house. This test is currently awaiting UKAS accreditation. |
| Parvovirus Quantitative DNA (Parvovirus viral load) | Whole Blood | 6 ml EDTA (Pink Top) | N/A | 3 days | Serology for IgM and IgG, Current or Past Infection.<br>This test is performed in-house. This test is currently awaiting UKAS accreditation. |
| Rapid SARS CoV2 PCR (COVID-19, novel coronavirus) | Respiratory samples (NPA, nasopharyngeal or throat) | Blue top eNAT VTM | Detected / not detected | 2 hours | PCR test for the new coronavirus, the disease is known as COVID-19. Apply recommended Infection Prevention and Control precautions<br><br>This test is fully validated for clinical use. |

| Test | Sample type | Container | Ref Ranges | Turnaround time | Additional requirements and other comments |
|---|---|---|---|---|---|
| Rapid SARS CoV2/Flu A/Flu B/RSV PCR (COVID-19, novel coronavirus) | Respiratory samples (NPA, nasopharyngeal or throat) | Blue top eNAT VTM | Detected / not detected | 2 hours | PCR test for the new coronavirus, Flu A, FluB and RSV. Apply recommended Infection Prevention and Control precautions<br><br>This test is fully validated for clinical use. |
| Respiratory PCR | Nose and throat swabs<br>NPA, BAL, ETA | Universal transport medium<br>Sterile Universal | N/A | 2 days<br>(See note) | Turnaround time is 3 days for CMV PCR and PCP. |
| 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<br>The presence of antibody levels of at least 10 IU/mL of sample is indicative of past exposure to rubella virus. |
| SARS CoV-2 Detection (COVID-19, novel coronavirus) | Respiratory samples (NPA, nose and throat swab, BAL and ETTs) | Virology swab or 0.5 ml in universal container | Detected or NOT detected | 24 hrs | PCR test for the new coronavirus, the disease is known as COVID-19. Apply recommended Infection Prevention and Control precautions<br>This test is fully validated for clinical use. |
| SARS CoV-2 antibody (COVID-19, novel coronavirus) | Serum | 5ml GEL SST (Rust Top) | | 72 hrs | |
| Varicella zoster IgG antibodies | Serum | 5ml GEL SST (Rust Top) | See report | 3 days | Past Infection. |
| Viral Detection (PCR) | CSF, | Sterile universal | Not detected | 3 days | Includes: HSV-1, HSV-2, VZV, Enterovirus, Parechovirus, HHV-6, CMV, EBV, Adenovirus |
| Viral Detection (PCR)<br>Eye | Swab | Swab in VTM | Not detected | 5 days | Includes: HSV-1, HSV-2, VZV, Enterovirus, Adenovirus |

| Test | Sample type | Container | Ref Ranges | Turnaround time | Additional requirements and other comments |
|---|---|---|---|---|---|
| Viral Detection (PCR) vesicle / ulcer | Swab | Swab in VTM | Not detected | 5 days | Includes: HSV-1, HSV-2, VZV, Enterovirus |
| Viral Detection (PCR) | Plasma | 5ml EDTA | Not detected | 5 days | Includes HHV8, Parechovirus, Enterovirus, HSV. This test is performed in-house. This test is currently awaiting UKAS accreditation. |
| Viral Detection (PCR) JC virus | CSF, Plasma | EDTA if plasma. CSF in sterile universal. | Not detected | 5 days | Not currently performed in house; this test is referred to Micropathology, Coventry |
| BKV | Whole Blood | 6 ml EDTA (Pink Top) | N/A | 3 days | Serology for IgM and IgG, Current or Past Infection.<br><br>This test is performed in-house. This test is currently awaiting UKAS accreditation. |
| Adenovirus PCR | Whole Blood/Paediatric urine | 6 ml EDTA (Pink Top) | N/A | 3 days | This test is performed in-house. This test is currently awaiting UKAS accreditation. |

## 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. |
| Ascaris Antibodies | Serum | 5 ml GEL SST (Rust Top) | See report | 21 days | Not currently performed in house; this test is referred. |
| Anti-staphylococcal antibodies | Serum | 5 ml GEL SST (Rust Top) | Negative | 21 days | Not currently performed in house; this test is referred. |
| Aspergillus Antigen (Galactomannan) | Serum | 5 ml GEL SST (Rust Top), Respiratory ( BAL) sample 2mls in universal container | Serum <0.5, BAL <=1.0 | 10 days | Due to sample stability, please send sample immediately after collection and avoid taking samples on Fridays and Weekends. |
| Aspergillus precipitins | Serum | 5 ml GEL SST (Rust Top/Yellow Top) | Negative 0 - 40 mgA/L | 21 days | |
| 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. |
| Bartonella serology | Serum | 5 ml GEL SST (Rust Top) | Negative | 21 days | Not currently performed in house; this test is referred. |

| Test | Sample Type | Container | Ref Ranges | Turnaround time | Additional requirements and other comments |
|---|---|---|---|---|---|
| Beta D Glucan | Serum | 5 ml GEL SST (Rust Top) | <4.7 | 10 days | Due to sample stability, please send sample immediately after collection and avoid taking samples on Fridays and Weekends. |
| 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. Not currently performed in house; this test is referred. |
| Brucella antibodies | Serum | 5 ml GEL SST (Rust Top) | Negative | 14 days | Not currently performed in house; this test is referred. |
| Coccidioides Abs | Serum | 5 ml GEL SST (Rust Top) | See report | 21 days | Not currently performed in house; this test is referred. |
| Cystercercosis antibodies | Serum | 5 ml GEL SST (Rust Top) | Negative | 21 days | Not currently performed in house; this test is referred. |
| 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. |
| Filarial Antibodies | Serum | 5 ml GEL SST (Rust Top) | Negative | 21 days | Not currently performed in house; this test is referred. |
| Histoplasma antibodies | Serum | 5 ml GEL SST (Rust Top) | Negative | 21 days | Not currently performed in house; this test is referred. |
| Hydatid antibodies | Serum | 5 ml GEL SST (Rust Top) | Negative | 21 days | Not currently performed in house; this test is referred. |
| Legionella antibodies | Serum | 5 ml GEL SST (Rust Top) | Negative | 21 days | Preferred test is the *Legionella* antigen test. |

| Test | Sample Type | Container | Ref Ranges | Turnaround time | Additional requirements and other comments |
|---|---|---|---|---|---|
| Leishmania antibodies | Serum | 5 ml GEL SST (Rust Top) | See report | 21 days | Not currently performed in house; this test is referred. |
| Leptospira antibodies | Serum | 5 ml GEL SST (Rust Top) | Negative | 21 days | Not currently performed in house; this test is referred. |
| Lyme or Borrelia antibody screen | Serum | 5 ml GEL SST (Rust Top) | Negative | 8 days (Non Negative Results 10 - 14 days) | Positive Samples are referred<br>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. |
| Rickettsial antibodies | Serum | 5 ml GEL SST (Rust Top) | Negative | 21 days | Not currently performed in house; this test is referred. |
| Schistosomal antibodies | Serum | 5 ml GEL SST (Rust Top) | See report | 21 days | Not currently performed in house; this test is referred. |
| Strongyloides antibodies | Serum | 5 ml GEL SST (Rust Top) | Negative | 21 days | Not currently performed in house; this test is referred. |
| RPR<br>(Rapid Plasma Reagin) | Serum | 5 ml GEL SST (Rust Top) | Negative | 7 days | Usually performed as part of Syphilis screening test. |
| Syphilis screen (including antenatal 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. |
| Toxoplasma screen | Serum | 5 ml GEL SST (Rust Top) | Not detected | 7 days | Samples giving an IgM positive or equivocal test result or those repeatedly IgG Equivocal/IgM Not detected will be reported as such and sent to a reference laboratory for further tests. Additional interpretative comments may be |

| Test | Sample Type | Container | Ref Ranges | Turnaround time | Additional requirements and other comments |
|---|---|---|---|---|---|
| | | | | | added to reports as required, depending on results of IgG and IgM assays." |
| Trichinella antibodies | Serum | 5 ml GEL SST (Rust Top) | Negative | 21 days | Not currently performed in house; this test is referred. |
| Trypanosomal Antibodies | Serum | 5 ml GEL SST (Rust Top) | Negative | 21 days | Not currently performed in house; this test is referred. |
| 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. |
| Yersinia antibodies | Serum | 5 ml GEL SST (Rust Top) | Negative | 21 days | Not currently performed in house; this test is 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: Please refer to the UKAS website http://www.ukas.com/search-accredited-organisations/ for UKAS accredited laboratories

## List of Reference Laboratories used

| Reference laboratory Name and Address | Phone Number if available |
|---|---|
| Dr Elizabeth M. Johnson,<br>Director PHE Mycology Reference Laboratory,<br>Curator National Collection of Pathogenic Fungi,<br>National Infection Service,<br>PHE South West Laboratory,<br>Science Quarter,<br>Southmead Hospital,<br>Bristol<br>BS10 5NB | 0117 4146222<br>option 5 mycology |
| Micropathology Ltd. University Of Warwick Science Park, Barclays Venture Centre, Sir William Lyons Road, Coventry, West Midlands, CV4 7EZ | 02476 323222 |
| Virus Reference Division, Centre For Infections, Health Protection Agency, 61 Colindale Avenue, London NW9 5EQ | 020 7679 9490 |
| Rare and Imported Pathogens Laboratory, (RIPL), PHE, Manor Farm Road, Porton Down, Wiltshire, SP4 0JG | 01980 612100/01980 612348 |
| Microbiology, Epsom and St Helier Hospital | Epsom:- 01372 735 994 St Helier:- 020 8296 2841 |
| Meningococcal / Pneumococcal Reference Laboratory, PO Box 209, Clinical Science Building, Manchester Royal Infirmary, Oxford Rd, Manchester M13 9WZ | 0161 276 6757 |
| Antimicrobial Assay Reference Laboratory, Dept Of Medical Microbiology, Lime Walk Building, North Bristol NHS Trust, Southmead Hospital, Westbury on Trym, Bristol BS10 5NB | 0117 414 6220 / 6269 |
| BIOMNIS, 17/19 Avenue Tony Garnier, 69007 Lyon, France | +33 4 72 80 10 10<br>0117 414 6220 / 6269 |
| Respiratory and vaccine preventable bacteria reference unit (RVPBRU), 61 Colindale Avenue<br>London NW9 5HT | 0208 200 4400 |
| Sexually transmitted bacteria reference unit (STBRU) ), 61 Colindale Avenue<br>London NW9 5HT | 020 7679 9490 |
| Gastrointestinal bacteria reference unit (GBRU) , 61 Colindale Avenue<br>London NW9 5HT | 020 7679 9490 |
| Antimicrobial resistance and healthcare associated infections reference unit (AMRHAI)<br>Public Health England, 61 Colindale Avenue, London, NW9 5EQ | 020 8327 7887 |
| Clinical Microbiology and Virology, UCLH NHS Foundation Trust, 60 Whitfield Street, London, W1T 4EU | 02073077373<br>02039120294 203 447 8964 |
| Toxoplasma Reference Laboratory, Department of Microbiology (PHE) Singleton Hospital, Swansea SA2 8QA | 01792 285058 |
| Department of Immunology, Churchill Hospital, Headington , Oxford OX3 7LG | 01865 225995 |
| Clinical Immunology Laboratory, Level 4, Camelia Botnar Labs, Great Ormond Street Hospital for Children, Great Ormond Street, London WC1N 3JH | 020 7829 8835 |
| Bone Marrow Laboratory, Level 2, Camelia Botnar Labs, Great Ormond Street Hospital for Children, Great Ormond Street, London WC1N 3JH | 020 7829 7901 |
| Clinical Immunology Laboratory, Level 4, Camelia Botnar Labs, Great Ormond Street Hospital for Children, Great Ormond Street, London WC1N 3JH | 020 7829 7901 |

| Reference laboratory Name and Address | Phone Number if available |
|---|---|
| Regional Molecular genetics Laboratory, Level 6, York House, Great Ormond Street NHS Trust, 37 Queen's Square, London WC1N 3BH | 020 7405 9200 ext 6888 |
| Supraregional Protein Reference Unit & Department of Immunology, PO Box 894, Sheffield S5 7YT. | 0114 271 5552 |
| Department of Immunology, Churchill Hospital, Headington , Oxford OX3 7LG | 0121 507 4258 |
| Microbiology Department St Helier Hospital Wrythe Lane Carshalton SM5 1AA | 01372 735 994, 020 8641 4011 |
| Neuro immunology and CSF Laboratory, Institute of Neurology (NHNN) Box 76, Queen Square, London WC1N 3BG | 020 33483814 |
| Neuro immunology and CSF Laboratory, Institute of Neurology (NHNN) Box 76, Queen Square, London WC1N 3BG | 020 33483814<br><br>0141 354 9010/9023 |
| The Glasgow Neuroimmunology Laboratory, Level 1B, Laboratory Medicine & Facilities Building, Queen Elizabeth University Hospital, 1345 Govan Road GLASGOW, G51 4TF | |
| Molecular Diagnostics Unit<br>Imperial College, St Mary's Hospital | |
| Addenbrookes Hospital Cambridge, Clinical Immunology, Box 109, Level E4, Addennbrooke's Hospital, Hills Road, Cambridge CB2 0QQ | 01223 348145 (x 58145) |
| Rainer Doffinger, Addenbrookes Hospital Cambridge, Clinical Immunology, Box 109, Level E4, Addennbrooke's Hospital, Hills Road, Cambridge CB2 0QQ | 01223 217441 (x3441) |
| Immunodermatology laboratory, St John's Institute of Dermatology, St Thomas' Hospital, Westminster Bridge Road, London SE1 7EH, 020 7188 6408) | 0114 271 5552 |
| Clinical Immunology Laboratory, Level 4, Camelia Botnar Labs, Great Ormond Street Hospital for Children, Great Ormond Street, London WC1N 3JH. | |
| Dr Helen Lachmann, National Amyloidosis Centre, Royal Free and University College London Medical School<br>Dept of Medicine, Royal Free Campus, Rowland Hill Street, London NW3 2PF | 020 7433 2725 |
| Cardiff Toxicology Laboratories, The Academic Centre, University Hospital Llandough, Penarth, Vale of Glamorgan CF64 2XX | 029 2071 6894 |
| 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 | 020 3299 6155 |
| Centre For Virology, Royal Free Hospital, Hampstead Site, Rowland Hill Street, London, NW3 2PF | 020 344 78994 |
| Dept Of Virology, Public Health Laboratory, Birmingham Heartlands Hospital, Bordesley Green East, Birmingham B9 5SS | |
| Dept Of Virology, Public Health Laboratory, Birmingham Heartlands Hospital, Bordesley Green East, Birmingham B9 5SS | |
| Rabies Diagnostic Unit, Veterinary Laboratories Agency, New Haw, Addlestone, Surrey, KT15 3NB. | |
| Dr Abid Karim, Neuroimmunology, The Medical School, University of Birmingham, Edgbaston, Birmingham B15 2TT | 0121-415-8797 |
| RCI Laboratory NHSBT<br>Barnsley Centre<br>Capitol Way<br>Junction 37 M1<br>Barnsley<br>South Yorkshire<br>S75 3FG<br>*(formerly Longley Lane, Sheffield)* | |

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

## 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/CONTACT NUMBERS

The NWL Pathology Infection & Immunity Clinical Lead is Consultant Immunologist Dr Peter Kelleher and the Microbiology specialist Lead is Dr. Hugo Donaldson. Dr. Panos Pantelidis 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.

## MICROBIOLOGY CONTACT NUMBERS

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

| Site | Contact | Name | Tel No. | Bleep / Mobile | Other |
|---|---|---|---|---|---|
| Cross Site | Results/Enquiries | | 35353 | | |
| | Divisional Manager | Dr. Panos Pantelidis | 17262 | | via Switchboard |
| | Deputy Divisional Manager | Monica Rebec | 15198 | | |
| | 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 | Mobile 07584881860 | |
| | Laboratory Manager | Manfred Almeida | 15158 | Mobile 07827 904062 | |
| | Specialist Scientist | Sweenie Goonesekera | 17883 | | |
| | Microbiology Lab Manager | Anna Morkowska | 15157 | | |
| | I&I Sciences Governance & Quality Manager | Yvonne iroadumba | 15175/10143 | | |
| | Department secretary | | 17262 / 17257 | | |
| | On-Call BMS | | Mobile 07766133404 | | |
| St Mary's | St Mary's hospital clinical advice enquiries | | 21562 | | |
| | Consultant | Dr Dunisha Samarasinghe | 21074 | | via Switchboard |
| | Consultant | Dr Victor Vasquez Zorrila | 21817 | | via Switchboard |
| | Consultant | Dr. Joanna Peters | 21817 | | via Switchboard |
| | Specialist Registrars | | 21562 / 25345 | 1010 | |
| Hammersmith | Hammersmith hospital clinical advice enquiries | | 32075 / 73 (*not manned during ward rounds*) | | |
| | | | | | |
| | Specialist Registrars | | 31973/32073/75 | 5008 | |
| | Consultant | Dr Anan Ghazy | | | via Switchboard |
| | Consultant | Dr. Frances Davies | 31974 / 32073 | | via Switchboard |
| | 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 | | via Switchboard |
| West Middlesex University Hospital | Consultant | Dr. Hugo Donaldson* *(based primarily at WMUH)* | 0208 321 5784 | | via Switchboard |
| | Consultant | Dr. Farhana Butt | 0208 321 6882 | | via Switchboard |
| | Consultant | Dr. Nupur Goel | 0208 321 6539 | | via Switchboard |
| Hillingdon Hospital | Consultant | Dr Stella Barnass | 01895 279290 | | via Switchboard |

| | | | | | |
|---|---|---|---|---|---|
| | Consultant | Dr Josephine Elfick | 01895 279115 | | via Switchboard |
| | Consultant | | 01895 279834 | | via Switchboard |

## SPECIMEN INFORMATION AND ADDITIONAL TESTS

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

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 hospital site.

Note there are specific arrangements in place for each site.

## REQUESTS FOR ROUTINE INVESTIGATIONS

NB Do NOT send precious sample via the pneumatic tube system

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 a regular 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 porters ext: 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 it to Microbiology 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 mobile/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 mobile/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 mobile/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 mobile/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°C.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 mobile/bleep 0248to 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 mobile/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 mobile/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

The Out of hours details for Hillingdon Hospital

Hillingdon s Hospital (Monday to Friday 1700 to 0800)

Routine

- There will be three scheduled collections at 1800, 1945 and 2200 to transport microbiology specimens from Pathology at C&W to the Charing Cross site.

- Send samples to Hillingdon Pathology Specimen Reception, 1st floor, Tower block.

Urgent

- Requesting doctor to contact both Hillingdon Pathology Specimen Reception (extension 2571) or, bleep the on-call Biomedical Scientist on 5602, and also the Biomedical Scientist in Microbiology at Charing Cross (020 3311 1234, bleep 0248) to inform them of the urgent sample being sent.

- Take sample to Hillingdon Pathology Specimen Reception, 1st floor Tower block

- Hillingdon Pathology Specimen Reception staff will arrange for an adhoc urgent courier to transport the sample to Microbiology CXH.

# 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 |
| 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) | 5 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<br><br>CSF PCR Biofire | CSF<br><br>CSF | Preferably three sequentially labelled sterile universal containers ≥1 mL<br><br>Sterile universal with at least 0.4ml | 3 days<br><br>12 hours | Transport to the laboratory as soon as possible, after informing laboratory personnel<br><br>Test must be approved by the Microbiology or Virology Consultant. Transport to the laboratory as soon as possible |
| 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/ Cobas® CT/NG collection kit. Genital swabs in Cobas® CT/NG Collection kit. Refer to: COBAS-collection-kits | 5 days | Transport to the laboratory on the day of collection or store overnight at room temperature<br><br>This test is currently awaiting UKAS accreditation. |

| Investigation | Samples tested | Container & Sample volume | Turnaround time | Additional transport requirements and other comments |
|---|---|---|---|---|
| | | September-2022.pdf (nwlpathology.nhs.uk). | | |
| Combined CT / Neisseria gonorrhoeae (GC) NAAT | First-catch urine• Genital swabs (urethral, cervical, vulvo-vaginal and rectal) Extra-genital swabs (throat or conjunctival) | Urine in sterile universal container- cobas® CT/NG Roche Cobas sample collection kit (male/female). Genital swabs in Cobas® CT/NG Collection kit. Refer to COBAS-collection-kits September-2022.pdf (nwlpathology.nhs.uk) | 5 days | Transport to the laboratory on the day of collection or store overnight at room temperature<br><br>This test is currently awaiting UKAS accreditation. |
| Lymphogranuloma venerum LGV | Rectal sample sent for Chlamydia/gonorrhoea NAAT and positive for C. trachomatis. | SDA collection kit/Cepheid collection kit/ RocheCobas® collection kit | 1 week | Please contact the laboratory for advice, if needed |
| 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 | |

| Investigation | Samples tested | Container & Sample volume | Turnaround time | Additional transport requirements and other comments |
|---|---|---|---|---|
| Cross infection screen | Swabs, urine | Swabs in Amies transport medium | 3 days | To screen for the following organisms:<br>• Multi-drug resistant coliforms<br>• Multi-drug resistant Acinetobacter baumanni<br>• Vancomycin-resistant enterococci (VRE)<br>• Carbapenemase-producing Enterobacteriaceae (CPE)<br>• Carbapenamase PCR Test results available on separate accession number. Samples may be referred to UK Health Security Agency for further investigation |
| Cryptococcal antigen test | Serum, CSF | Rust Top Vacutainer, sterile universal container for CSF | 2 days | |
| 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 | 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 |

| Investigation | Samples tested | Container & Sample volume | Turnaround time | Additional transport requirements and other comments | |
|---|---|---|---|---|---|
| | | to patients on collecting a faeces sample. | | | |
| 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 |
| Faecal Enteric PCR (Detection of Salmonella, Shigella, Campylobacter, Verotoxigenic Escherichia coli (VTEC), Giardia, Cryptosporidium) | Faeces | 1 ml in Sterile universal container | 4 days | To identify faecal pathogens other than the targets listed above, appropriate clinical details must be provided so a full culture can be added. Samples may be referred to Public Health England for further investigation For a full list of test limitations, refer to the website entry hyperlinked in the test name | |
| 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 | | |

| Investigation | Samples tested | Container & Sample volume | Turnaround time | Additional transport requirements and other comments | |
|---|---|---|---|---|---|
| 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<br>• Other samples in sterile universal container | 2 weeks | Transport to the laboratory on the day of collection or store overnight at room temperature | |
| 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°C 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 |

| Investigation | Samples tested | Container & Sample volume | Turnaround time | Additional transport requirements and other comments | |
|---|---|---|---|---|---|
| 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.<br>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 | |
| 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 |

| Investigation | Samples tested | Container & Sample volume | Turnaround time | Additional transport requirements and other comments | |
|---|---|---|---|---|---|
| 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 | Urogenital swab (dry swab or PCR collection swab), urine, neonatal NPA | 2 mls in Sterile universal container | 4 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 | |
|---|---|---|---|---|---|
| Mycoplasma genitalium screen and resistance assay | Urine or urogenital swab | Roche M.genitalium collection kit | 4 days | Refer to website entry for additional information on handling<br>This is a newly implemented test that has not yet undergone UKAS accreditation. This test was previously referred externally to Micropathology Special requests for Mycoplasma hominis or Ureaplasma sp. PCR will be referred to Micropathology. | |
| 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 | See Virus Screen-gastroenteritis | |
| 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 | | |

| Investigation | Samples tested | Container & Sample volume | Turnaround time | Additional transport requirements and other comments | |
|---|---|---|---|---|---|
| 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 | | |
| Pneumocystis (PCP) immunofluorescence (IF) | Note: This test is no longer available. PCP is now referred externally for PCR testing. Please see below. | | | | |
| PCP (Pneumocystis) PCR | Induced sputum, Bronchoalveolar lavage, Bronchial washing | 2 mls in Sterile universal container | | Not currently performed in house; this test is referred to Micropathology, Coventry | |
| Pus and/or abscess culture | Aseptically collected pus and/or abscess aspirate/drain | ≥1 mL in Sterile universal container | (Up to) 7 days | | |
| Rectal swab culture (other than GUM samples) | Swab | Amies transport medium | 3 days | | |
| Respiratory tract culture<br><br>BioFire® FilmArray® Pneumonia Panel | Bronchial/tracheal fluid<br><br>Bronchoalveolar lavage fluid (Bal)<br><br>Nasopharyngeal Swab | 2 mls Sterile universal container (not sputum trap container) | 3 days<br><br>12 hours | | Transport to the laboratory as soon as possible. Request must be approved by the consultant |

| Investigation | Samples tested | Container & Sample volume | Turnaround time | Additional transport requirements and other comments | |
|---|---|---|---|---|---|
| FilmArray® Respiratory Panel 2 plus | | Blue top eNAT viral transport medium | 12 hours | | Microbiologist or virologist |
| Rotavirus, Adenovirus | Faeces | 1 – 2 ml (min 0.5ml) in Sterile Universal container | 3 days | See also Virus Screen-gastroenteritis | |
| 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. |
| Sexual health (GUM) screen | • Genital swabs (urethral, cervical, vulvo-vaginal)<br>• Extra-genital swabs (rectal and throat)<br>• 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°C 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 | | |

| Investigation | Samples tested | Container & Sample volume | Turnaround time | Additional transport requirements and other comments | |
|---|---|---|---|---|---|
| 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. | |
| 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. | The laboratory will not be UKAS accredited for this test at any time 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 | | |

| Investigation | Samples tested | Container & Sample volume | Turnaround time | Additional transport requirements and other comments |
|---|---|---|---|---|
| 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 | |
| Combined Trichomonas Vaginalis PCR/M.Genitalium | First-catch urine• Genital swabs (urethral, cervical, vulvo-vaginal and rectal) Extra-genital swabs (throat or conjunctival) | Urine in sterile universal container-cobas® CT/NG Roche Cobas sample collection kit (male/female). Genital swabs in Cobas® CT/NG Collection kit. Refer to COBAS-collection-kits September-2022.pdf (nwlpathology.nhs.uk) | 5days | This test is currently awaiting UKAS accreditation. |
| 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 | Red cap Boric acid container | 2 days | Click here for instructions to patients on how to collect a urine sample |
| Urine Schistosoma microscopy | Terminal catch of early morning urine | Sterile universal container | 2 days | |

| Investigation | Samples tested | Container & Sample volume | Turnaround time | Additional transport requirements and other comments |
|---|---|---|---|---|
| Urine cast examination | Mid-stream clean-catch 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 |
| Virus Screen- gastroenteritis:<br><br>Targets include<br>Adenovirus F40/F41 DNA<br>Astrovirus RNA<br>Norovirus genogroup I RNA<br>Norovirus genogroup II RNA<br>Rotavirus A RNA<br>Sapovirus RNA | Faeces | Universal faeces container | 3 days- same day testing available if pre-arranged with the lab | Transport to the laboratory on the day of collection or refrigerate overnight<br><br>The laboratory is not UKAS accredited for this test |
| 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<br>University of Warwick Science park Venture Centre Sir William Lyons Road Coventry CV4 7EZ | 16S or 18S Ribosomal PCR,Acanthamoeba PCR<br>Whipples PCR |
| Anaerobic reference laboratory<br>NPHSMicrobiology,<br>Cardiff UniversityHospital of Wales, HeathPark Cardiff CF14 4XW | Identification of Anaerobic bacteria and *Actinomyces* |
| Hospital for Tropical Diseases (HTD) Department of Clinical Parasitology<br>3 rd floor Mortimer Market<br>Tottenham Court Road<br>London WC1E 6DG | Intestinal parasites identification<br>*Acanthamoeba* identification<br>Microsporidia PCR |
| Antimicrobial Resistance and Healthcare Associated Infections (AMRHAI)<br>PHE, 61 Colindale Avenue,<br>London, NW9 5HT | Serological Typing<br>PVL toxin gene detection<br>Extended toxin gene detection<br>Genomovar determination<br>MIC evaluation<br>ESBL detection<br>Carbapenem resistance<br>Acquired AmpC<br>*mecA*PCR<br>*mupA*PCR<br>Linezolid resistance<br>Identificatiobn |
| Rare and Imported Pathogens Laboratory<br>Manor Road Porton<br>Salisbury<br>Wiltshire<br>SP4 0JG | Identification of Anthrax |
| Respiratory and vaccine preventable bacteria reference unit (RVPBRU)<br>PHE, 61 Colindale Avenue,<br>London, NW9 5HT | *Bordetella* culture, identification, PCR<br>Respiratory Chlamydia PCR<br>*Legionella* culture, confirmation and typing and urine antigen detection<br>*Mycoplasma* and *Ureaplasma* culture and identification<br>*Haemophilus* identification and typing<br>Epidemiological typing of streptococci<br>Identification of *Streptococcus*sp and related genera<br>Identification and toxigenecity testing of *Corynebacteriumdiphtheriae* |
| Animal and Plant Health Agency<br>New Haw, Addlestone<br>Surrey KT15 3NB | Identification of *Brucella* sp. |
| Laboratory of Gastrointestinal Pathogens<br>PHE, 61 Colindale Avenue,<br>London, NW9 5HT | *Campylobacter* identification, molecular typing and susceptibility testing<br>*Salmonella, Shigella, Vibrio, Yersinia* and *E. coli* (including serotype O:157) identification and typing<br>*Helicobacter* identification and susceptibility testing<br>*Bacillus* sp., *C. botulinum*, *C. perfringens*, *C. tetani*, *Listeria* sp. and *S. aureus* toxin/gene detection, isolation, identification and typing |
| Meningococcal Reference Laboratory<br>PO BOX 209 Manchester Royal Infirmary<br>Clinical Science Building<br>Oxford Road Manchester M13 9WZ | Meningococcal identification, characterisation, sensitivity testing and PCR<br>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 |

| Reference Laboratory | Test referred |
|---|---|
| Mycology Reference Laboratory (PHE)<br>Bristol Royal Infirmary<br>Myrtle Road, Kingsdown<br>Bristol BS2 8EL | Fungal identification and sensitivity testing |
| Cryptosporidium Reference Unit<br>Public Health Wales Microbiology ABM<br>Singleton Hospital<br>Swansea SA2 8QA | Cryptosporidium |
| Diagnostic Parasitology Lab<br>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

## ANTIBIOTIC ASSAYS

Assays for Vancomycin, Amikacin and Gentamicin are carried out in Clinical Biochemistry under the Clinical Biochemistry test scope. Clinical support is provided by Microbiology consultants. Please refer to the Clinical Biochemistry section of 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 Clinical 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.