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PATHOLOGY USERS' HANDBOOK

Revision History		
Version	Date	Purpose of Issue/Description of Change
000-010	22/12/06-31/07/18	See QPulse record
011	10/02/20	Post 2019 UKAS RA findings; clarification of use of UKAS logo and what parts of the service are accredited and inclusion of reference ranges for laboratories. Inclusion of all CR's to date.
012	29/07/22	Post 2021 UKAS SU2 assessment. Update to Histopathology consultant contact details, to Blood Sciences roles and contact details, Quality Manager details and Microbiology consultant details and service times. Remove reference to andrology (semenology) service at HDFT including appendix 2a and 2b. Update blood tube ordering arrangements. Update specimen requirements as required. Update Mortuary information. Update to Haematology and coagulation reference ranges. Update to Biochemistry equipment and reference ranges. Update cervical cytology referral location. Update Histopathology section. Removal of some of the IPC detail as IPC are separate to Microbiology.
013	06/02/23	Addition of comment regarding interpretation of paediatric coagulation. Change in B12 reference range. Spelling corrections in Microbiology section. Addition of instruction in Histopathology section on requests requiring fresh tissue.
014	01/09/23	Update Phlebotomy opening times, update for Phlebotomy at Chain Lane Community Hub. Update contact details for Cross-site Service Leads. Update haematology, blood transfusion and microbiology test lists. Update list of tests that are not accredited to ISO 15189.
015	20/10/23	Update list of tests that are not accredited to ISO 15189 as per UKAS finding.
016	17/06/24	Update staffing, test lists and TAT. Update to allow for use of POD for sending Blood Cultures. Add in statement regarding impartiality. Update for ISO 15189:2022.
017	08/08/24	Correct phone number errors. Update staffing details. Add POCT section. Add tests missing from previous versions in each discipline. Update HAS in Blood Transfusion.
018	17/10/24	Remove Consultant Microbiologist bleep number. Add clarity on phlebotomy areas within scope of accreditation. Update tests not accredited. Amend Blood Transfusion requirements. Correct micro errors. Remove reference to cremation forms in Mortuary.
019	01/08/25	Amendment of reference ranges Quantiferon, FIT, added to not accredited tests, and changed from Newcastle to in house. 'Covid' replaced with 'respiratory PCR'. Added details of NHSE Blood Culture Pathway requirements. Added instructions for collection of Quantiferon samples to p66 and appendix 5 added. Removal of Chlamydia antibody and respiratory OPD/GP testing. TB testing changed from Newcastle to Airedale. Immunology moved to Biochemistry Turn-around times in Immunology temporarily increased by additional approx. 21 days
020	14/10/25	Additional non accredited tests added to the list (targets other than RSV, SARS-CoV-2, FluA and FluB) to list of non-accredited tests.Minor formatting changes. Added platelet function tests to samples that cant be sent via the pod system.
021	11/06/26	Updated Microbiology non accredited tests. Removed Respiratory PCR OOH information. Updated sample retention information for Microbiology. Updates to Microbiology table 1 and 2. Quantiferon testing performed in house. Added H.pylori isolation to Microbiology table 1. Updated molecular TATs for Histopathology. Updated contact details. Updated non accredited tests to include POCT glucose meters.
022	17/7/26	Update the biochemistry phone list to include ferritin, update the location of CCP and IFA testing, Changed the retention time of HbA1c samples Addition of <i>C. auris</i> screening to Microbiology section. Updated policies available on HDFT PolicyStat.
Review interval		2 years
Location of Copies		QPulse
Associated Working Instructions		None

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GENERAL INFORMATION

Introduction

A comprehensive Pathology Laboratory Service is provided by the Departments of Biochemistry, Haematology/Blood Transfusion, Histopathology and Microbiology¹. Mortuary Services are provided at Harrogate District Hospital (HDH), and Phlebotomy Services for inpatients on the wards and out-patients in the Blood Test Room. Point of Care testing (POCT) services are supported and managed by the pathology team and are governed by a multidisciplinary POCT committee.

The Pathology Department provides a service for patients at HDH and Ripon Hospitals, GP Practices, Outreach Clinics, Private Hospitals and clinics and other commercial organizations. It also provides a phlebotomy service for local GP patients at Chain Lane Community Hub in Knaresborough.

The pathology service is delivered by Integrated Pathology Solutions LLP (IPS), a joint venture between the Pathology departments of Harrogate and District NHS Foundation Trust, Airedale NHS Foundation Trust and Bradford Teaching Hospitals NHS Foundation Trust.

Location of the Laboratories

The Pathology laboratories are housed on two floors in the Fewston Wing at HDH. Access to the department is at the Pathology Reception Area which is on the second floor of the Fewston Wing.

The address of the laboratories is:

Pathology,
Fewston Wing,
Harrogate District Hospital,
Lancaster Park Rd.,
Harrogate,
North Yorkshire, HG2 7SX

Quality Statement

IPS LLP is committed to providing a diagnostic and consultative service of the highest quality informed by and taking into consideration the needs and requirements of its patients and users and supported by effective user consultation and feedback.

For the most current UKAS status please visit the UK UKAS website at <https://www.ukas.com/> and search under the accreditation number 8646.

¹ Where the term Blood Sciences is used in this document, it refers to the Biochemistry & Haematology / Blood Transfusion Departments.

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The UKAS publication GEN 6 (Reference to accreditation and multilateral recognition signatory status by UKAS accredited bodies) stipulates the need to identify tests that are accredited and distinguish from those that are not. The HDFT Pathology Laboratory does not make reference to UKAS accreditation (or use of the UKAS accreditation symbol) in its reports. This is to avoid interference with the interpretation of pathology results (particularly those that have interpretive comments or a high number of assays reported). Where a test is non-accredited this will be indicated on the report, if this will not detract from other critical clinical comments. However, a full list of non-accredited tests are stated below.

As of the document date of issue stated in the header box above, the following tests are not accredited;

- Helicobacter pylori antigen (micro)
- Sterile fluids collected into blood culture bottles (micro) – this is not recommended, as it is not a validated test.
- WBC count on synovial fluid (micro)
- Pleural, ascitic and drainage fluids (haem)
- Frozen sections (histo)
- Warthin-Starry stain (histo)
- Shikata Orcein stains (histo)
- HER2 testing (histo)
- PRAME testing (histo)
- H&E by hand staining (histo)
- Papanicolaou by hand staining (histo)
- Toluidine Blue stain (histo)
- CSF for cytology (histo)
- H&E on non-gynae specimens (histo)
- Cryoglobulins (biochem)
- Adjusted calcium (biochem)
- Albumin/globulin ratio (biochem)
- Fluids all tests (biochem)
- Faecal Immunochemical – (biochem)
- Anion gap (biochem)
- Unconjugated bilirubin (biochem)
- LDL cholesterol (biochem)
- Non HDL cholesterol (biochem)
- Cholesterol/HDL ratio (biochem)
- Albumin/creatinine ratio (biochem)
- Protein/creatinine ratio (biochem)
- AKI 1, 2, 3. (biochem)
- Unsaturated iron binding capacity (biochem)
- POCT INR (POCT)
- FPP glucose meter used by the renal unit (POCT)
- NOVA StatStrip Glucose/ Ketone meters. (POCT)

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- Abbott NeoH glucose/ketone meter used by HDFT outreach staff, dental staff and community nursing teams (POCT)
- Lateral flow testing in ED (POCT)
- Direct susceptibility testing of urines (Microbiology) – Where susceptibility tests are reported, a mixture of direct and indirect methods are used, depending on individual circumstances
- Extended respiratory PCR testing by BioFire for the following targets (Microbiology):
 - adenovirus,
 - coronavirus 229E,
 - coronavirus HKU1,
 - coronavirus NL63,
 - coronavirus OC43,
 - MERS-CoV-2,
 - human metapneumovirus,
 - human rhinovirus/enterovirus,
 - parainfluenza virus 1,
 - parainfluenza 2,
 - parainfluenza virus 3,
 - parainfluenza virus 4,
 - *Bordetella pertussis*,
 - *Bordetella parapertussis*,
 - *Chlamydia pneumoniae*,
 - *Mycoplasma pneumoniae*).
- Hospital tap water testing for *Pseudomonas aeruginosa* (Microbiology)
- Diasorin Liaison QuantiFERON IGRA (Microbiology)
- *Candidozyma auris* screening (Microbiology)

As of the document date of issue stated in the header box above, the following services are not accredited;

- Phlebotomy at the following location: Chain Lane Community Hub, Knaresborough; Community Diagnostic Centre (CDC), Ripon Hospital; Domiciliary locations.
- Digital reporting of Histopathology requests
- Roche Coaguchek Pro II meter used by pharmacy
- Pregnancy testing across HDFT
- Actim partus and actim prom used by labour ward

The laboratory will periodically review all aspects of the service provided to ensure clinically appropriate tests are available and that the service meets the needs and requirements of patients and laboratory users.

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Telephone Extension Numbers of Senior General Pathology Staff

(Numbers of departments, consultants and senior scientific staff may be found under each departmental section. Numbers in **bold** represent the HDH internal extension number)

Lead Pathologist

Dr Izabela Georgiades 01423 55**5072**

Senior Scientific Staff

Afruj Ruf, IPS Managing Director 07773 961695
Mark Harrison, IPS Director of Operations 07773 965768
Mrs Rebecca Parish, Pathology General Manager - IPS Blood Sciences & Harrogate site 01423 55**5842**
07773 948767
Mr Mohammad Rizwan, Pathology General Manager - IPS Microbiology & Airedale site 07773 941075
Dr Hannah Bateson, Pathology General Manager – IPS Service Improvement and Patient Facing Services 07773 489197
Andrew Whittingham-Hirst, General Manager – IPS Histopathology & Bradford site

Mrs Houghton, Pathology Quality Manager 01423 55**3065**
Mr Charles Flouri, IT Manager 01423 55**3147**
Ms Nicky Hollowood, IPS POCT Cross site Lead & HDFT Lead Healthcare Scientist 01423 55**5858**
Ms Emma Jocelyn, Phlebotomy Manager 01423 55**5660**

Lead Consultants

Dr Nudar Jassam, Clinical Lead, Blood Sciences 01423 55**3055**
Dr Katharine Scott, Specialty Lead, Microbiology 01423 55**5658**
Dr Catherine Lo Polito, Specialty Lead, Histopathology 01423
553107
Dr Sarah Glover, Specialty Lead Point of Care Testing 01423 55**3056**
Dr Emma Harris, Specialty Lead, Haematology 01423 55**2218**

IPS Clinical Leads

Dr David Earl, IPS Medical Director david.earl@nhs.net
Dr Nuthar Jassam, IPS Clinical Director, Blood Sciences 01423 55**3055**
Dr Izabela Georgiades IPS Clinical Director, Histology 01423 55**5072**
Dr Alison Muir, IPS Clinical Director Microbiology 01423 55**5674**

Protection of Patient Information and Confidentiality

The laboratory will maintain the confidentiality of patient information by following Trust policy on *Confidentiality and Security of Personal Information* and national guidelines including the Caldicott principles. It will only disclose information on patients to other health care professionals who need to know that information in

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order to provide effective care and treatment to that patient. The information provided will be the minimum necessary to allow appropriate and effective care.

In cases where a specimen may need to be referred to an external laboratory for specialised testing, patient consent to disclose clinical information and family history to that laboratory is assumed as given, as part of the overall consent to take the specimen and perform the test. If the patient does not agree to this position, please contact the laboratory Clinical Lead.

Complaints

Complaints about laboratory services or staff may be made to any member of staff within Pathology (see contact details above) in writing, by email or verbally. The Trust Complaints Procedure (set out in the *Making Experiences Count Policy*) which meets the requirements of The Local Authority Social Services and National Health Service Complaints (England) Regulations 2009 will be followed to investigate the complaint and report on the outcome of the investigation.

If you raise a complaint you will receive an acknowledgement within 3 working days. This may be verbal or in writing but will be followed up with a written letter from the Chief Executive. The investigating officer will contact you to discuss the complaint further. The investigation will be carried out in a timely manner.

Impartiality

The laboratory is structured and managed to ensure impartiality. HDFT Trust procedures are adhered to with regard to declaration of any conflicts of interest. Where these exist, they will be managed in accordance with HDFT procedures.

SERVICE AVAILABILITY

Clinical Advice

Consultant staff are available 24/7 for clinical advice for Biochemistry, Haematology & Microbiology. At evenings and weekends they are contactable via switchboard.

Histopathology Consultants are available 09:00 to 17:00 Monday – Friday (excluding Public Holidays)

Laboratories

Blood Sciences (Haematology, Biochemistry, Transfusion)			
Time	Monday to Friday	Saturday and Bank Holidays	Sunday
09:00 – 20:00	Normal service*		On call service [†]
08:00 – 12:30		Restricted service [‡]	
12:30 – 20:00		On call service [†]	
20:00 – 09:00	On call service [†]	On call service [†]	On call service [†]

* Normal routine service – Contact ext 3000. NB: Single handed Biomedical Scientist between 17:30 and 20:00.

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† Out-of-Hours service. Please bleep Biochemistry on 5116, Haematology & Blood Transfusion on 3066

‡ Restricted service for Priority Requests only, which must be received in the laboratory by 11.00hrs to allow for processing

Microbiology				
Day	Normal hours of Service*	Restricted Service‡	Respiratory PCR Testing	On Call Service†
Weekdays	09.00-17.30		09:00 – 17:30	17.30-20.30
Saturdays		09:00-12.30	09:00 – 17:30	12.30-20.30
Sundays and Public holidays		09.00-12.30	09:00 – 17:30	12.30-20.30

* Normal routine service – Contact ext 5645.

† Out-of-Hours service. On Call Biomedical Scientist: contact can be made via switchboard who will know of their whereabouts. On Call Consultant Microbiologist: contact can be made via switchboard. Between the hours of 20.30 and 06:00 specified requests (sterile fluids and CSFs) via ICE can be sent for testing at AGH. After 06:00, specimens will be processed at 09:00 at HDFT Microbiology.

‡ Restricted service for Priority Requests only, which must be received in the laboratory by 11.00hrs to allow for processing

Histopathology			
Time	Monday to Friday	Saturday and Bank Holidays	Sunday
08:45 – 17:00	Normal service*	No service	No service
17:00 – 08:45	No service	No service	No service

* Please note that urgent specimens must reach the department before 16:45 unless by prior arrangement with a consultant Histopathologist.

Phlebotomy

Wards			
Time	Monday to Friday	Saturday and Bank Holidays	Sunday
08:00 – 12:00	Normal service*	Restricted service‡	Restricted service‡
13:00 – 16:30	Urgent service†	No service	No service
Blood Room			
08:30 – 16:50	Normal service*	No service	No service
Chain Lane Community Hub			
07:30 – 11:00	Normal am service	No service	No service
Ripon Hospital Community Diagnostic Hub			
08:30 – 12:00	Normal service	No service	No service
13:00 – 16:30	(Wed to Fri only)		

* Normal Ward or Blood Room collection

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† During the afternoons Monday to Friday there is a roving Phlebotomy service, where a single handed Phlebotomist performs a sweep of the wards for urgent samples and then responds to bleep (3453) requests for urgent requests (e.g. Blood Cultures)

‡ The weekend service is **only for urgent bloods** (e.g. deteriorating / post-op patients) are put out for collection. If we receive excessive requests these will have to be left on the ward.

Point of Care testing (POCT) Department

Support for POCT devices is provided Monday-Friday 09:00hrs to 17:00hrs. During these times, please contact department on ext 5647, bleep 5647 or email hdft.poct@nhs.net

Outside these hours please leave a message on the answerphone for non-urgent requests or contact the main Pathology laboratory for *urgent* requests and advice.

On Call Test availability – Haematology & Blood Transfusion

This service is intended to provide urgent results, where there is an immediate clinical requirement to inform decision making in patient care.

Do not request any routine group and save or cross match requests during this time as only emergency/urgent transfusions will be performed out-of-hours as per the transfusion policy.

Any reasonable request will be undertaken; however any requests that appear unreasonable will be questioned, and may be referred to the on-call Consultant Haematologist for advice.

On Call Test availability - Biochemistry

Following a discussion between the member of staff "on call" and the requesting doctor or a deputy, the following tests should be available if a case of need has been explained. The majority of these tests are automated and are performed using the Beckman DXI and AU system.

Glucose,
Urea and Electrolyte and Osmolality
(serum and urine).
Amylase,
Bone Profile
Liver Function Tests,
Lipids
CK

Magnesium
Calcium and adjusted Calcium.
Total and Conjugated Bilirubin
Serum Iron,
Urate
Bile Acids
C Reactive Protein

Simple Drug Assay i.e.
Theophylline

Salicylates
Alcohol

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Paracetamol
Digoxin

Lithium

Procalcitonin
Ammonia
Lactate
HCG

CSF Analysis
Cortisol
Troponin I
CSF Xanthochromia

Tests, other than those listed above may be performed but should be first discussed with the Duty Biochemist.

Out-of-Hours Arrangements for Microbiology Hospital Specimens Weekday evenings, Saturday, Sunday and Bank holiday evenings (until 20:30)

The following samples will be processed from in-patients:

- CSF
- Blood cultures
- Fluid from normally sterile sites
- Urines
- MRSA screening samples (if urgent)
- Pus
- Deep tissue swabs
- All specimens from ITU patients
- Genital samples from maternity patients

Specimens must be received by 20:30 to guarantee processing.

The rest of the time is strictly limited to 'on-call' urgent specimens. A telephone request for dealing with such specimens must be made directly to the 'on-call' Biomedical Scientist at Airedale General Hospital (AGH) and be related to the following:

- CSF
- Joint fluid
- Other fluids from normally sterile sites

All other requests will only be considered after a discussion with the duty Consultant Microbiologist

Routine service for Respiratory PCR testing 09:00 to 17:30 7 days a week.

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PATHOLOGY REQUEST FORMS

All Pathology requests need to be made with an appropriate request form. The request form is taken as evidence of consent from the patient for the tests to be performed. Initial verbal requests for examinations will not be accepted until receipt of a request form. It is important that sufficient information is provided with each request to allow for unequivocal traceability of the patient to the request and specimen.

Where there is additional information required relating to specific requests, e.g. fasting, this should be recorded in the clinical details section.

For additional examinations please refer to the section 'Requests for Additional Examinations' in the department sections. It is not possible for the laboratory to accept requests for additional tests from the patient themselves.

ICE Request Forms

The ICE electronic requesting system is available throughout the hospital and all GP practices. It should be used wherever possible, for the completion of requests for Microbiology, Haematology, Transfusion and Biochemistry. ICE may also be used for certain Histopathology and POCT requests. The use of ICE for requests reduces the risk of mislabelling patient samples as well as providing legible information on the patient, which may otherwise be incorrectly recorded within Pathology. Amendments should not be made to ICE requests once the form has been printed. When tests requested on ICE populate the LIMS it is assumed that there is consent for those tests to be performed. Handwritten requests may be used during times of IT failure.

Training is provided by the IT department for all Doctors, Nurses and other clinical staff, who need to use the system at which time individual passwords are issued.

A specimen bag is supplied, which is designed to be attached to the ICE request forms using an adhesive strip. Please ensure this bag is sealed properly using the adhesive strip provided. The ICE form must not be folded and placed in the bag with the specimens as there is a risk of contamination of the form should the specimen container leak and this may obscure important information on the form.

Samples and request forms from GP surgeries must be placed into a secondary polythene bag which must be placed into a padded specimen transport bag prior to transport from GP surgery to the hospital site.

For further details regarding the transportation of samples, copies of the laboratory Standard Operating Procedure may be requested, document reference GP-MP-EXST.

Handwritten Request Forms

In areas where the ICE system is not yet available (or when the system is down) and for the specialities of Histopathology and Non-gynaecological Cytology, pre-printed request forms with attachable specimen bags are available. It is the clinician's duty

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to complete and sign the form. In those cases where a nurse fills in or signs the forms, the Consultant/GP name, under whose responsibility the request lies must be filled in. It is **ESSENTIAL** that you write **LEGIBLY** with a ball-point pen. If printed labels showing patient details are available, ensure that one is attached to the form. In all cases please also ensure that all the relevant details have been included, especially:

- The patient details (forename, surname, date of birth, sex, NHS number or hospital number, home address).
- Whether NHS/Private
- Details of the requestor (requesting doctor's name and name of the consultant responsible for the patient's care)
- Name, address and telephone number or the hospital ward/source to which the report should be returned
- A brief summary of the relevant clinical details.
- The tests requested.
- The specimen date and time (if you are giving a request form to a patient for a test to be taken at some point in the future, please enter time/date unknown as this cannot be confirmed by you).
- The specimen type

An individual form must be completed for each patient request and separate specimens should be submitted for any but the most closely related tests.

Please note that the request bags for different Pathology disciplines are colour-coded:

- Blood Transfusion: **RED**
- Clinical Sciences (Haematology & Biochemistry): **GREEN**
- Histology and Non-gynaecological Cytology: **BLACK**
- Microbiology: **BLUE**

Requests for Urgent Specimens

If the specimen requires urgent analysis, then an "Urgent" sticker should be affixed to the request form and the laboratory should be telephoned to alert them that an urgent sample is on its way together with details of the patient, tests required and location of the patient.

High Risk and Danger of Infection Specimens

Pathological specimens and request forms from patients known to be, or suspected of being, infected with pathogens from Hazard Groups 3 and 4 should carry a yellow '**Danger of Infection**' or red '**High Risk**' sticker. In this Trust, the most common agents from these groups are the blood-borne viruses (HIV, hepatitis B, hepatitis C), and *Mycobacterium tuberculosis*. Respiratory PCR specimens should be double bagged and attached to request forms.

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After putting the specimen into its container, affix a yellow 'Danger of Infection' or red 'High Risk' sticker to the container and ensure that caps are secure; contamination of the outside must not occur. Place the container in the plastic bag and close with the adhesive strip (only one specimen per bag). Bags must not be sealed with pins, staples or metal clips, and the request cards should also be labelled with 'Danger of Infection' or 'High Risk' stickers. For large specimens (e.g. histopathology, 24 hour urines) the containers may be enclosed in individual clear plastic sacks tied at the neck. The request form must not be placed in the sack, but should be enclosed in a separate plastic envelope, which is then securely attached with tape to the sack.

Do not use the pneumatic tube system for transporting High Risk and Danger of Infection specimens.

Where the specimen is to be collected by another healthcare worker (e.g. Phlebotomist), it is the responsibility of the person completing the request forms to affix a yellow 'Danger of Infection' or red 'High Risk' sticker.

It is the responsibility of the person taking a specimen from a patient to ensure that the specimen container is correctly labelled to indicate a danger of infection. Only the 'Danger of Infection' or 'High Risk' sticker need be clearly visible to all who handle the material during delivery and on reception. In this way confidentiality of the clinical information may be maintained.

Samples from patients who are suspected of having viral haemorrhagic fever (e.g. Ebola virus), **must not** be transported to the laboratory in the pneumatic tube system. Further advice about management of these patients must be sought from the Infection Prevention & Control team or a Consultant Microbiologist.

If there are any accidents with the specimens, a Consultant Microbiologist must be promptly informed.

SPECIMENS

General Advice

The value of Pathology investigations depends very much on the quality and nature of the specimen. Care should be taken to obtain an adequate, representative specimen, place it in the correct container, complete the documentation and ensure its prompt delivery to the laboratory. The requirements for particular tests are set out in detail in each laboratory speciality.

The proper collection of samples, avoiding contamination, should not be delegated to untrained staff. Further advice may be obtained from senior laboratory staff, as listed above.

Please ensure that all routine work is collected and delivered to the laboratory in good time during working hours on weekdays. If the normal hours are missed the specimens will be stored and delays may be likely to influence the accuracy and clinical usefulness of the results. To avoid unnecessary weekend working for routine

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tests that take longer-than-average processing times (such as most microbiology tests) please submit these samples early in the week.

Phlebotomy Services

A Phlebotomy service is provided in the Blood Tests Room in the Outpatient Department, Harrogate District Hospital. This service is principally intended for the collection of samples from hospital out-patients and there is opportunity for local GPs to refer patients for blood tests during those hours. To alleviate the pressure on the hospital service there is also a Phlebotomy service provided within Chain Lane Community Hub in Knaresborough. Out patients or GP patients are encouraged to use this extra facility at Chain Lane. Appointments are not required except when unusual or special tests are needed. Phlebotomy services are provided to all wards on the HDH site during the hours specified above.

Completion of the appropriate Pathology Request remains the responsibility of the requesting clinician and this must be completed prior to the Phlebotomists commencing their rounds. For patients attending the Blood Room at HDH or Chain Lane Community Hub they must bring the completed Pathology request form with them.

Labelling Specimens

Specimen containers must be labelled clearly with the following information:

- Forename and Surname or unique code identifier (spelt correctly, initials for the forename are not acceptable)
- Date of Birth
- NHS Number and/or Hospital Number
- Source of specimen
- Date of specimen

For blood transfusion requests these data must be hand-written. The Trust has a 'zero tolerance' policy on all mislabelled transfusion samples. All transfusion samples must contain; forename and surname spelt correctly, date of birth and hospital number or NHS number and date bled. Any discrepancies in any of these core identifiers will result in the sample being rejected and the patient re-bled.

Addressograph labels must not be used on blood specimen tubes as they obscure the contents and make specimen separation difficult. The containers to be used for particular specimens are detailed in the speciality sections below. Good labelling of both specimens and forms will ensure speedy processing with appropriate tests and return of results to the right place without delay.

Members of staff *must not* submit samples from themselves or their family directly for Pathology testing. Such testing may be done as appropriate via the Occupational Health Department or via the person's own GP.

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A minimum of 3 unequivocal patient identifiers will be accepted for Haematology, Biochemistry and Microbiology which is to include first name and surname or the unique code identifier.

For partially labelled Histology samples the clinician will be contacted and asked to attend the department to complete the relevant details. The sample will be on hold and processing delayed until the clinician corrects the labelling.

Partially labelled one-off or invasive samples e.g. CSF for Microbiology and Chemical Pathology investigations will be retained in the laboratory and the person who took the sample will be contacted to add the missing information where they are assured of the origin of the sample. Signing of a disclaimer form will be required.

Partially labelled blood samples will NOT be accepted unless: The sample is part of a unique set (e.g. timed series) which would require a repeat procedure, or cannot be repeated (e.g. pre-op tumour marker).

For a detailed explanation of the Trust sample labelling policy please see the *Policy for the Identification and Acceptance of all Laboratory Samples*. This document is available in PolicyStat.

Rejection of Unacceptable Specimens

In the case of broken, leaking, unlabelled and mislabelled specimens a number of risks arise, including:

- Risks of injury or infection to the handlers.
- Risks of contaminated microbiology that may be clinically misleading.
- Risks of results wrongly ascribed to a patient, this may lead to incorrect diagnosis or inappropriate treatment with consequent medico-legal risks.

After receipt in the laboratory, such specimens will normally not be processed (see Trust Policy for the Identification and Acceptance of samples). The requesting doctor, if known, will be contacted and informed of the problem. For samples that are not easily repeated (such as curettings, biopsies, deep aspirates, GP samples etc.) the Consultant or most senior BMS will make a decision on whether testing may be allowed to proceed (usually after discussion with the clinician concerned). With the exception of Blood Transfusion specimens/requests the requestor will usually be given the opportunity to come to Pathology and complete patient information on the specimen or request and sign a disclaimer. If the specimen is tested the report will clearly state the nature of the problem as a comment. Alternatively, the requesting clinician will be asked to send a repeat sample.

Packaging for Transport of Specimens

Each specimen should be placed in an individual plastic transport bag (as supplied integral with or separate from the request form) of an adequate size for containment and closure (by adhesive strip closure). Staples and other sharp items must not be

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used on the bags as they may cause dangerous injury and inoculation. *On no occasion should Pathology specimens be placed in an internal transit envelope.*

Samples need to be transported in the inner polythene bags provided and outer 'Transport Cases' when being sent from areas outside of the main hospital complex. Please contact the laboratory for further details if required. All hospital transport systems will carry the required containment systems for samples.

Ordering Sample Collection Bottles and Pathology Stationery

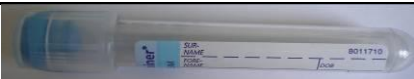
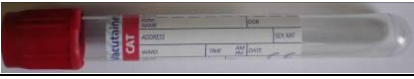
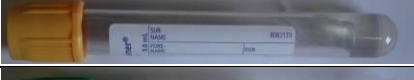
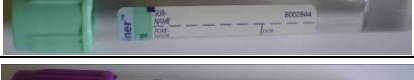
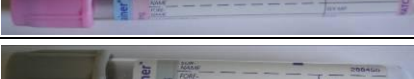
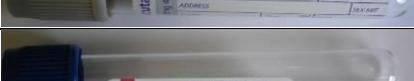
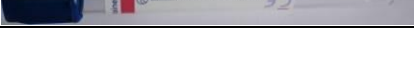
The wards and clinical areas are responsible for obtaining and maintaining their own stocks of tubes and sample collection vessels. These are ordered electronically from the Stores Department at Harrogate Hospital. These should be regularly checked for sufficient stock levels and expiry dates. Pathology is not responsible for maintaining individual areas. In the case of specialised collection instructions - these are detailed in the tables below for each department.

Enquiries on requisitions can be made directly to: Stores, HDH, Ext 01423-553611,

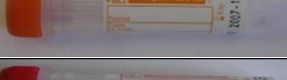
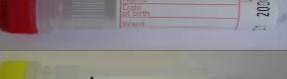
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Adult Blood Tube Types

Colour	Tube Type	Other	Draw Volume	Inversions	Tube
Light Blue/Clear	Sodium Citrate		1.8ml	3-4 times	
Red	Serum		6ml	5-6 times	
Gold	Serum	Gel Separator	5ml	5-6 times	
Green	Heparin		4.5ml	8-10 times	
Light Green	Heparin	Gel Separator	4.5ml	8-10 times	
Purple	EDTA		4ml	8-10 times	
Pink	Cross Match		6ml	8-10 times	
Grey	Fluoride Oxalate		2ml	8-10 times	
Royal Blue	Trace Element		7ml	8-10 times	

Paediatric Blood Tube Types

Colour	Tube Type	Other	Draw Volume	Inversions	Tube
Blue	Sodium Citrate		1.0ml	8-10 times	
Black/Clear	Serum		1.3ml	5-6 times	
Brown	Serum	Gel Separator	0.5ml	5-6 times	
Orange	Heparin		1.3ml	8-10 times	
Red	EDTA		1.3ml	8-10 times	
Yellow	Fluoride Oxalate		1.3ml	8-10 times	

****Please note the tubes are in the recommended order of draw. Blood culture bottles should be drawn first but are exempt from this list.***

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Collection and Transport Arrangements

At Harrogate District Hospital

Use the Pneumatic Tube System (PTS) (Pod system) whenever possible for urgent specimens. Any specimen may be sent in the PTS with the exception of:

- Specimens with a 'Danger of Infection' or 'High Risk' sticker
- CSF specimens
- Histopathology samples
- Respiratory PCR Samples
- Quantiferon TB-Gold specimens
- Platelet Function tests (platelet aggregation, platelet glycoproteins and platelet nucleotides).

If the PTS is not available place specimens in the yellow boxes situated at the nurses' station on all wards and theatres (only these will get collected by the porter). Collection times from these positions are broadly as follows:

Routine specimens Monday to Friday:

09:00, 11:00, 13:00, 15:00, 17:00.

Saturday morning: 10 30 am (for delivery to the laboratory by 11:00)

Urgent specimens may be labelled with an 'Urgent' label and sent via the PTS. If the PTS is not available, ward/medical staff must contact the porters to request collection of urgent specimens. In order to ensure a timely response from the laboratory, medical staff must telephone the appropriate Pathology discipline prior to sending an urgent request.

In order to comply with the NHSE Blood Culture Pathway Guidance to load specimens onto analysers within 4 hours of collection, specimens should be transported as soon as possible. Blood culture specimens may be sent via the PTS system.

Outside of routine hours: If the PTS is not available, for delivery of all urgent specimens for analysis by Pathology on call staff, ward/medical staff must contact the Porters to have such specimens collected.

During the night, non-urgent specimens may be sent via the PTS or can be collected by arrangement with the porter. Biochemistry samples not sent or collected immediately should be stored at room temperature.

From Ripon Hospital

Place specimens in box in Reception. These specimens are collected by the transport staff at 12:30 hours and 15:00 hours. There is a late collection, by taxi, at 18:00 hours.

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Arrangements for Specimen Collection from Sites Outside Hospital

A courier visits the main GP surgeries and other clinics on a daily basis Monday to Friday (except for Bank and Statutory Holidays) to collect specimens. The numbers and times of the pick-up are dependent on location; however most surgeries receive two collections a day Monday – Friday excluding Public Holidays. If there are specimens that are being left until the next day for collection, they should remain at room temperature (with the exception of Microbiology specimens and full blood count specimens which should be held at 4°C).

Transport of Histopathology specimens

Please refer to the Trust Policy 'TRANSPORT OF HISTOPATHOLOGY SPECIMENS POLICY'

This is available on PolicyStat using the following link:

[Transport of Specimens to the Histopathology Department Policy](#)

PATHOLOGY REPORTS

We aim to perform the laboratory tests and send interim and final reports out as promptly as possible. Since all reports from Pathology are computer-generated, the quality and legibility of information received on the request forms is critical.

The reference ranges of results for tests are included in the report where appropriate. Reference ranges for each test are shown in the departmental sections below. Results lying outside the reference range are highlighted in red. Please contact the Consultants or other senior laboratory staff to discuss any further interpretations or doubts that may arise from the reports.

There are many potential interfering substances which may be referenced on Pathology reports such as haemolysis, icterus, lipaemia, concurrent drug therapy such as antibiotic treatment and many others. The degree to which these interfering substances affect results is very varied, hence a comprehensive list is inappropriate for this handbook. Information can be sought from the laboratory carrying out specific tests as to the nature and significance of any interfering substance.

Each test performed by the laboratory carries with it an inherent level of error known as the uncertainty of the test. Uncertainty is calculated for all of the tests offered by the laboratory and its clinical relevance assessed. Similar to potential interfering substances the uncertainty will not normally be a consideration when interpreting results, however should more information be required this is available at a test level from the specific laboratories carrying out the tests.

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Reports are returned to the clinical team indicated on the request form. They are not provided direct to patients. Should the laboratory be contacted by a patient or their representative regarding the results of laboratory tests they will be directed to contact the clinical team who made the request. To ensure patient confidentiality, the laboratory will not be able to provide information to patients on the status of any request for testing that may have been made.

Paper Reports

Paper reports are printed for a very limited number of units who do not receive electronic reports. Reports are printed throughout the day on coloured paper specific for each Pathology Department (see above). These are sorted and distributed by the internal mail system or by hospital courier in the case of GP practices. Paper reports are not available for results generated from POCT devices available at the point of care (some POCT devices do provide a paper printout).

When doctors have taken note of the results they should make sure that all reports, whatever the results, are filed in the patient's case notes to provide a permanent record (this is a formal requirement in the Health Service).

Electronic Reports

Once authorised, Pathology results from all disciplines (with the exception of some POCT results) are available for viewing on the PCs throughout the Hospital using the ICE and WebV system. ICE will also report electronically to GP surgeries. Electronic reports are available significantly sooner than paper reports.

Contingency arrangements

The department has contingency plans in place to maintain provision of a laboratory service. Should there be a significant delay to results the laboratory will endeavour to communicate this to users of the service.

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PHLEBOTOMY

Contact Details

Name	Job Title	Tel.No./Bleep	Email
Dr Hannah Bateson	Pathology General Manager – IPS Service Improvement & Patient Facing Services	07773 489197	Hannah.bateson2@nhs.net
Ms Emma Jocelyn	Phlebotomy Manager	01423 555660	Emma.jocelyn@nhs.net
	OPD Phlebotomy	01423 553453	
	Phlebotomy Service enquiries	01423 553409	
	Phlebotomy Training	01423 553409	
	Ward Services	Bleep 3453 / 3454	

Phlebotomy Services

Phlebotomy services are provided at a number of locations. Within HDH this includes wards and the Blood Tests Room in the Outpatient Department. At Ripon Hospital a phlebotomy service is provided as part of the Community Diagnostics Centre (CDC).

Out patients or GP patients are encouraged to use the facility at Chain Lane or the CDC. Appointments are not required except when unusual or special tests are needed.

Completion of the appropriate Pathology Request remains the responsibility of the requesting clinician and this must be completed prior to the Phlebotomists commencing their rounds. For patients attending the Blood Room at HDH, Chain Lane Community Hub or Ripon CDC they must bring the completed Pathology request form with them.

The identity of the patient is checked against the request form that they provide to the phlebotomist. Consent to take the specimens is deemed to have been given by the patient when they present their arm to the phlebotomist to allow specimens to be collected.

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POINT OF CARE TESTING

Contact Details

Name	Job Title	Tel.No./Bleep	Email
Dr Hannah Bateson	Pathology General Manager – IPS Service Improvement & Patient Facing Services	07773 489197	Hannah.bateson2@nhs.net
Ms Nicky Hollowood	IPS -POCT Cross site lead	01423 555858	nicky.hollowood@nhs.net
Mrs Victoria Mercer	POCT Assistant Practitioner	01423 555647	hdfp.poct@nhs.net
Gemma Johnson	POCT Assistant Practitioner	01423 555647	hdfp.poct@nhs.net
Dr Sarah Glover	Specialty Lead POCT	01423 553056	sarah.glover1@nhs.net

Support for POCT devices is provided Monday-Friday 09:00hrs to 17:00hrs.

Outside these hours please leave a message on the answerphone for non-urgent requests or contact the main Pathology laboratory for *urgent* requests and advice.

Information on the POCT service is available on the Trust intranet.

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BIOCHEMISTRY and IMMUNOLOGY

Laboratory Staff Contact Details

Name	Job Title	Tel.No./Bleep	Email
Mrs Rebecca Parish	Pathology General Manager - IPS Blood Sciences & Harrogate site	01423 55 5842 07773 948767	rebecca.parish2@nhs.net
Mr Nazakat Ali	IPS Biochemistry Cross site Lead	01423 55 5618 07773 956776	Nazakat.ali2@nhs.net
Mr Zeb Hanif	Biochemistry Section Manager	01423 55 3060	zeb.hanif@nhs.net
Mr Philip Christy	Advanced BMS	01423 55 3059	philip.christy@nhs.net
Mrs Claire King	Advanced BMS	01423 553059	claire.king30@nhs.net
Lesley Bridson	Specimen Reception Section Manager	01423 55 3000 Option 7	lesley.bridson@nhs.net
Linda Bayes	Blood Sciences Secretary	01423 55 5665	linda.bayes@nhs.net

Contacts for Advice and Interpretation

Name	Job Title	Tel. No./Bleep	Email
Dr Nudar Jassam	Consultant Clinical Biochemist	01423 55 3055	n.jassam@nhs.net
Dr Sarah Glover	Consultant Clinical Biochemist	01423 55 3056	sarah.glover1@nhs.net
Dr Sinisa Savic	Consultant Immunologist	Immunology Network	0113 2065567
Dr Anoop Mistry	Consultant Immunologist	General Immunology	0113 2067067
On call Immunologist	SpR or Consultant Immunologist		Via Leeds switchboard
General Blood Sciences queries	Pathology Helpdesk		hdf.pathology-helpdesk@nhs.net

Outside routine hours (09:00 – 17:00) Clinical advice and Interpretation of results can be sought from the on-call Consultant Clinical Biochemist via Harrogate switchboard (01423 885959).

Referral Laboratories

Please request information from the Pathology laboratory regarding referral laboratories.

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Sample Retention Times

Sample will be retained for 5 days at 4°C.

Requests for Additional Examinations

Requests for additional examinations must be made as soon as possible, following the laboratory's receipt of the specimen. These requests must be made by telephone to the sample reception for General practice or by sending a new ICE request form to the Pathology reception. Depending on the nature of the specimen, and the request made, be aware that it may not be possible to accommodate your request although every effort will be made to do so, if clinically relevant. See Appendix 3 for information on time limits affecting add-on tests.

Investigations

The common test profiles outlined below which are analysed on the automated chemistry analyser, can be performed on one full 6ml gold topped serum sample.

Renal Profile:	Sodium, Potassium, Urea, Creatinine.
Bone Profile:	Alkaline Phosphatase, Calcium, Albumin and phosphate
Liver Function Tests (LFT):	Albumin, Alkaline phosphatase, Bilirubin and Alanine aminotransferase.
Lipid Profile:	HDL Cholesterol and triglycerides
Thyroid Function Test (TFT):	TSH (Free T4 where appropriate)

The electronic ICE requesting service guides users on the appropriate samples required and the amount required to perform the selected analyses.

Routinely results for GP samples will be available the next working day.

Interferences on Biochemistry Assays

When the integrity of the sample interferes with the assay this will be reported in the results accordingly.

Where assays are known to have interference with other assays, the laboratory will have reviewed the information as part of the verification process. Where necessary results that could be affected by interference will have been removed or a suitable comment added.

Factors affecting test performance

1. Wrong container used
2. Wrong sample type for investigation required
3. Delay in transportation and transport conditions
4. Volume of specimen
5. Poor quality specimens
6. Sample storage conditions including temperature
7. Time between specimen collection and analysis

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Biochemistry Phone List

These phone levels apply only to unexpected results, that is those who have not had raised levels previously and are not known to have a disease where these levels would be expected.

Test	Value	Group	Episode	Comment
AKI	AKI 2 AKI 3	All – NOT A&E/IT	First episode	On all new occurrences and episodes
Ammonia	≥ 100 µmol/L	All	All	
Amylase	≥ 600 IU/L	All	First episode	First episode only to add on LDH and Ca
ALT	≥ 600 IU/L	OP, GP's, A+E	First episode	
	≥ 1000 IU/L	In patient	First episode	
AST	≥ 600 IU/L	OP, GP's, A+E	First episode	
	≥ 1000 IU/L	In patient	First episode	
Bicarbonate	≤ 10 mmol/L	In Patients and GP only only	First episode	
Bile acids	≥ 19 µmol/L	LW + Mat Ass Unit + ANC + Rip ANC + Pannal + CM	All	Community Midwives (CM) Bile acid results (OOH): Phone the on call biochemist
Bilirubin - Total	≥ 300 µmol/L	Babies < 4 wks	All	
Bilirubin - Conj	≥ 25 µmol/L	< 1 yr	All	
Calcium (Adjusted)	≤ 1.8 mmol/L & ≥ 3.0 mmol/L	All	First episode	
CK	≥ 5000 IU/L	All	First episode	
Cortisol	≤ 100 mmol/L	All	All	Unless Dexamethasone test
Creatinine	≥ 354 µmol/L	All Except renal (dialysis) unit	First episode	No need to phone if there is evidence that a similar high conc. has been previously phoned.
	≥ 200 µmol/L	< 16 yr	First episode	
CRP	≥ 300 mg/L	GP patients	First episode	
Digoxin	≥ 2.5 µg/L		First episode	
Ethanol	≥ 4000 mg/L	All	All	

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Test	Value	Group	Episode	Comment
	≥ 2000 mg/L	<18 yrs	All	
Ferritin	≥6000 µg/L	In patients & Acute Locations	First episode	
Glucose	≤ 2.5 mmol/L & ≥ 25 mmol/L	NOT if a known diabetic	All	
	≥ 30 mmol/L	if diabetic	All	
	≥ 15 mmol/L	<16 yr old	All	
HbA1c	≥120 mmol/mol	GP only	First episode	Phone results to GP in core hours only. OOH leave on phone list - Phoned by BMS to GP on the following working day
Iron	> 90 µmol/L	All	All	
Lithium	≥ 1.5 mmol/L	All	All	
Magnesium	≤ 0.4 mmol/L	All	First episode	unless drops further
Paracetamol	Any results	All	All	unless undetectable
Phosphate	≤ 0.3 mmol/L		First episode	unless drops further
Potassium	≥ 6.5 mmol/L ≤ 2.5 mmol/L	All	First episode	
Protein	≥100 g/L	All	First episode	
Sodium	≤ 120 mmol/L & ≥ 160 mmol/L	All	First episode	
	<110 mmol/L	All	All	
	≤ 130 mmol/L	<16 yrs	First episode	
Salicylates	≥ 300 mg/L	All	All	
Theophylline	≥ 25 mg/L		All	
Troponin I	≥ 17.6 ng/L	GP	All	Between 09:00am - 17:30 to Surg 17:30 - 09:00 to GP OOH
	≥ 17.6 ng/L	<u>OOH ONLY</u> - All In patients	All	<u>NOT</u> A&E AMU ITU CCU
Urate	≥ 340 µmol/L	LW + Mat Ass Unit + ANC + Rip ANC + Pannal + CM	First Episode	Community Midwives (CM) results OOH – leave on phone list - phoned by BMS to CM office on the following working day
Urea	≥ 30 mmol/L	All		Don't need to phone if there is evidence that a high result has been previously phoned

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Test	Value	Group	Episode	Comment
	≥ 10 mmol/L	< 16 yrs		
Vancomycin	≥ 20 mg/L	All	All	

These phone levels apply to all the abnormal results listed. The only exception is results for the renal dialysis unit.

References

Kidney disease: Improving global outcomes (KDIGO) acute kidney injury work group. Kidney inter., Suppl. 2012; 2: 1–138.

The communication of critical and unexpected pathology results.

Advice to pathologists and those that work in laboratory medicine. Royal College of Pathologists October 2017.

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Biochemistry Investigations

The following list of available tests is not exclusive and other tests may be available on request. Please contact the laboratory for further information, if required.

Blood Biochemistry	Container	Turnaround Times		Reference Ranges	Variables	Units	Retention Time	Test performed	Special Conditions
		Routine	Urgent						
ACE	1 x gold	1-2 week	N/A	See Report		U/L	N/A	YORK	
Albumin	1 x gold	24 h	3 h	See Report		g/L	5 days	IN HOUSE	
Alcohol (ethanol)	1x grey	24 h	3 h	See Report	Detection Range	mg/L	5 days	IN HOUSE	
Alkaline Phosphatase	1 x gold	24 h	3 h	See Report	FEMALE MALE	IU/L	5 days	IN HOUSE	Large variation age
Alkaline Phosphatase	1 x gold	24 h	3 h	See Report		IU/L	5 days	IN HOUSE	Large variation age
Alkaline Phosphatase iso enzymes	1 x gold	7 days	N/A	See Report		N/A	5 days	IN HOUSE	
ALT	1 x gold	24 h	3 h	See Report		IU/L	5 days	IN HOUSE	
Aluminium	1x dark blue	1-2 week	N/A	See Report		µmol/L	N/A	LEEDS SJUH	
Ammonia	1 x purple	N/A	3 h	See Report		Mmol/L	5 days	IN HOUSE	Must be received in laboratory within 30 minutes of collection
Amylase	1 x gold	24 h	3 h	See Report		IU/L	5 days	IN HOUSE	
AST	1 x gold	24 h	3 h	See Report	FEMALE	IU/L	5 days	IN HOUSE	
AST		24 h	3 h	See Report	MALE	IU/L	5 days	IN HOUSE	
Bicarbonate	1 x gold	24 h	3 h	See Report		mmol/L	5 days	IN HOUSE	
Bilirubin (direct/conjugated)	1 x gold	24 h	3 h	See Report		µmol/L	5 days	IN HOUSE	
Bilirubin (total)	1 x gold	24 h	3 h	See Report		µmol/L	5 days	IN HOUSE	
Blood Gases	Heparinised Syringe	N/A	N/A	See Report		SEE REPORT	N/A	IN HOUSE	POCT DEVICE

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Blood Biochemistry	Container	Turnaround Times		Reference Ranges	Variables	Units	Retention Time	Test performed	Special Conditions
		Routine	Urgent						
B Natriuretic Peptide (BNP)	1 x green	8 days	N/A	See Report	Age and sex related	kU/L	5 days	AIREDALE	
Calcium	1 x gold	24 h	3 h	See Report	Paed Range Applies	mmol/L	5 days	IN HOUSE	
Adjusted Calcium	1 x gold	24 h	3 h	See Report		mmol/L	5 days	IN HOUSE	
Calcium ionised	Heparinised Syringe	N/A	N/A	See Report		mmol/L	5 days	IN HOUSE	POCT DEVICE
Chloride	1 x gold	24 h	3 h	See Report		mmol/L	5 days	IN HOUSE	
Cholesterol	1 x gold	24 h	3 h	See Report	Age Dependent Range	mmol/l	5 days	IN HOUSE	
Creatinine kinase (CK)	1 x gold	24 h	3 h	See Report		IU/L	5 days	IN HOUSE	
Copper	1x dark blue	2 weeks	2 weeks	See Report		µmol/L	N/A	LEEDS SJUH	
Creatinine	1 x gold	24 h	3 h	See Report	Age and Gender Dependant Range	mmol/L	5 days	IN HOUSE	
D3 Hydroxybutyrate	1x gold or 1x grey	2 weeks	2 weeks	See Report		mmol/L	N/A	LEEDS ST.JAMES'	
Ferritin	1 x gold	48 h	5 h	See Report		ng/mL	5 days	IN HOUSE	
Fluids	Plain universal	24 h	3 h	See Report		Test dependant	5 days	IN HOUSE	
Folate	1 x gold	48 h	5 h	See Report		ng/mL	5 days	IN HOUSE	
Free Fatty Acids	1 x gold	3 weeks	3 weeks	See Report		mmol/L	N/A	LEEDS ST.JAMES'	
GGT	1 x gold	24 h	3 h	See Report		IU/L	5 days	IN HOUSE	
Globulin	1 x gold	48 h	5 h	See Report		g/L	5 days	IN HOUSE	
Glucose	1x grey	24 h	3 h	See Report		mmol/L	5 days	IN HOUSE	FASTING SAMPLE
HbA1C	1x purple	48 h	24 h	See Report	Diabetic Related	mmol/mol	24 - 48 hours	IN HOUSE	
HDL Cholesterol	1 x gold	24 h	5 h	See Report		mmol/L	5 days	IN HOUSE	FASTING SAMPLE
Iron	1 x gold	24 h	5 h	See Report		µmol/L	5 days	IN HOUSE	
Lactate	1x grey	24 h	3 h	See Report		mmol/L	5 days	IN HOUSE	

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		Routine	Urgent						
Lactate Dehydrogenase (LDH)	1 x gold	24 h	3 h	See Report		IU/L	5 days	IN HOUSE	
Lead	2x purple	24 h	3 h	See Report	ADULT RANGE	µmol/L	5 days	IN HOUSE	
Lithium	1 x gold	24 h	3 h	See Report	Trough Level	mmol/L	5 days	IN HOUSE	
Magnesium	1 x gold	24 h	3 h	See Report		mmol/L	5 days	IN HOUSE	
Osmolality	1 x gold	24 h	3 h	See Report		mOsm/kg	5 days	IN HOUSE	
Phosphate	1 x gold	24 h	3 h	See Report	Age Related	mmol/L	5 days	IN HOUSE	
Potassium	1 x gold	24 h	3 h	See Report		mmol/L	5 days	IN HOUSE	
Procalcitonin	1 x gold	24 h	3 h	See Report		Ug/L	5 days	IN HOUSE	
Rheumatoid factor	1 x gold	48 h	5 h	See Report		mmol/L	5 days	IN HOUSE	
Selenium	1x dark blue	1-2 Weeks	1-2 Weeks	See Report		µmol/L	N/A	LEEDS SJUH	
Serum electrophoresis	1 x gold	1 week	N/A	See Report		See report	5 days	IN HOUSE	
Serum free light chains	1 x gold	1 week	N/A	See Report		mg/l	5 days	IN HOUSE	
Sodium	1x gold	24 h	3 h	See Report		mmol/L	5 days	IN HOUSE	
Troponin	1x gold	24 h	3 h	See Report		ng/L	5 days	IN HOUSE	Baseline sample and repeat 3 hours later
Total Protein	1 x gold	24 h	3 h	See Report		g/L	5 days	IN HOUSE	
Triglycerides	1 x gold	24 h	3 h	See Report		mmol/L	5 days	IN HOUSE	FASTING
Urea	1 x gold	24 h	3 h	See Report	Age and Sex Related	mmol/L	5 days	IN HOUSE	DIET RELATED
Uric Acid	1 x gold	24 h	3 h	See Report	Age and Sex Related	mmol/L	5 days	IN HOUSE	
Vitamin A	1 x green	2 weeks	N/A	See Report	ADULT RANGE	µmol/L	N/A	LEEDS SJUH	Protect from light
		2 weeks	N/A	See Report	PAED RANGE	µmol/L	N/A	LEEDS SJUH	
Vitamin E	1 x green	2 weeks	N/A	See Report	ADULT RANGE	µmol/L	N/A	LEEDS SJUH	
		2 weeks	N/A	See Report	PAED RANGE	µmol/L	N/A	LEEDS SJUH	
Vitamin B12	1 x gold	48 h	5 h	See Report		ng/L	5 days	IN HOUSE	
Vitamin D	1 x gold	5 days	N/A	See Report		nmol/L	N/A	IN HOUSE	

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Blood Biochemistry	Container	Turnaround Times		Reference Ranges	Variables	Units	Retention Time	Test performed	Special Conditions
		Routine	Urgent						
Xanthochromia (CSF)	1 x plain universal	24 h	3 h	See Report		See report	5 days	IN HOUSE	
Zinc	1x dark blue	120 h	N/A	See Report	Sex related	µmol/L	N/A	LEEDS SJUH	

Urine Biochemistry	Container	Turnaround Times		Reference Range	Variations	Units	Retention Time	Test performed	Special Conditions
		Routine	Urgent						
5HIAA	24hrs + 50ml 30%HCl	2-3 Weeks	N/A	See Report		µmol/24h	N/A	HULL	
Amino Acid(quantitative)	Plain, random	1-2 Weeks	N/A	See Report		SEE REPORT	N/A	LEEDS SJUH	
Amino Acid (screen)	Plain, random	1 week	2-3 days	See Report		SEE REPORT	N/A	LEEDS ST. JAMES	
Alcohol	Plain, random	24 h	3 h	See Report		mg/L	5 days	IN HOUSE	
Bence Jones protein	Plain	5 days	N/A	See Report		SEE REPORT	5 days	IN HOUSE	Early morning urine
Calcium	24hrs + 50ml 30%HCl	48 h	5 h	See Report	FEMALE	mmol/24h	5 days	IN HOUSE	
		48 h	5 h	See Report	MALE	mmol/24h	5 days	IN HOUSE	
Creatinine	24hrs plain	48 h	5 h	See Report	FEMALE	mmol/24h	5 days	IN HOUSE	Random for paedts
					MALE	mmol/24h		IN HOUSE	
Creatinine Clearance	24hrs+ 1 x gold	48 h	5 h	See Report	Special interpretation for paedts	mL/min	5 days	IN HOUSE	
Cortisol	24hrs, plain	2 weeks	N/A	See Report		nmol/24h	N/A	LEEDS SJUH	
Cysteine	24hrs, plain	2-3 Weeks	N/A	See Report		N/A	N/A	LEEDS SJUH	

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Urine Biochemistry	Container	Turnaround Times		Reference Range	Variations	Units	Retention Time	Test performed	Special Conditions
		Routine	Urgent						
Albumin Creatinine Ratio (ACR)	Plain, random	4 h	5 h	See Report		mg/L	5 days	IN HOUSE	
Metabolic Screen	Plain, random	2 weeks	N/A	See Report		N/A	N/A	LEEDS SJUH	
Mucopolysaccharides	Plain, random	2 weeks	N/A	See Report		N/A	N/A	LEEDS SJUH	
Oxalate	24hrs+ 50ml 30%HCl	2-3 Weeks	N/A	See Report	FEMALE	µmol/24h	N/A	LONDON (UCL)	
Oxalate	24hrs+ 50ml 30%HCl	2-3 Weeks	N/A	See Report	MALE	µmol/24h	N/A	LONDON (UCL)	
Porphyrins	fresh 24hr urine kept in dark	2 weeks	N/A	See Report		N/A	N/A	CARDIFF	
	faeces sample	2 weeks	N/A	See Report		N/A	N/A	CARDIFF	
	1 x gold blood	2 weeks	N/A	See Report		N/A	N/A	CARDIFF	
Potassium	24hrs plain	48 h	5 h	See Report	Diet related	mmol/24h	5 days	IN HOUSE	Random for paed
Protein	24hrs, plain	48 h	5 h	See Report		g/L	5 days	IN HOUSE	Random for paed
Sodium	24hrs, plain	48 h	5 h	See Report	Diet related	mmol/24h	5 days	IN HOUSE	Random for paed
Urea	24hrs, plain	48 h	5 h	See Report		mmol/24h	5 days	IN HOUSE	Random for paed
Blood Endocrinology	Container	Turnaround Times		Reference Ranges	Variables	Units	Retention Time	Test performed	Special Conditions
		Routine	Urgent						
17 Hydroxyprogesterone	1 x gold	1-2 Weeks	N/A	See Report	FEMALE	nmol/L	N/A	LEEDS SJUH	Sample taken at 9am

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Blood Endocrinology	Container	Turnaround Times		Reference Ranges	Variables	Units	Retention Time	Test performed	Special Conditions
		Routine	Urgent						
		1-2 Weeks	N/A	See Report	MALE	nmol/L	N/A	LEEDS SJUH	
		1-2 Weeks	N/A	See Report	Neonates (stressed)	nmol/L	N/A	LEEDS SJUH	
		1-2 Weeks	N/A	See Report	Neonates(unstressed)	nmol/L	N/A	LEEDS SJUH	
ACTH	1 purple	1-2 Weeks	N/A	See Report		ng/L	N/A	LEEDS SJUH	Sample taken at 9am
Aldosterone	1x green (heparin)	2 weeks	N/A	See Report		pmol/L	N/A	LEEDS SJUH	
AFP	1 x gold	24 h	5 h	See Report		kU/L	N/A	IN HOUSE	
Beta HCG	1 x gold	24 h	5 h	See Report		IU/L	N/A	SHEFFIELD (RH)	
Cortisol	1 x gold	24 h	5 h	See Report	AM SAMPLE	nmol/L	N/A	IN HOUSE	
		48 h	5 h	See Report	PM SAMPLE	nmol/L	N/A	IN HOUSE	
Dehydroepiandrosterone (DHEA)	1 x gold	1-2 Weeks	N/A	See Report		SEE REPORT	N/A	LEEDS SJUH	
Dihydrotestosterone (DHT)	1 x gold	5 weeks	N/A	See Report	FEMALE	nmol/L	N/A	LEEDS SJUH	
		5 weeks	N/A	See Report	MALE	nmol/L	N/A	LEEDS SJUH	
DHA Sulphate (DHAS)	1 x gold	2 weeks	N/A	See Report	FEMALE	µmol/L	N/A	LEEDS SJUH	
		2 weeks	N/A	See Report	MALE	µmol/L	N/A	LEEDS SJUH	
Free T3 (FT3)	1 x gold	24 h	5 h	See Report		pmol/L	5 days	IN HOUSE	
Free T4 (FT4)	1 x gold	24 h	5 h	See Report		pmol/L	5 days	IN HOUSE	
FSH	1 x gold	24 h	5 h	See Report	Follicular	IU/L	5 days	IN HOUSE	
		48 h	5 h	See Report	MALE	IU/L	5 days	IN HOUSE	
Gastrin	CONTACT LAB	48 h	5 h	See Report		pmol/L	5 days	HAMMERSMITH	OVERNIGHT FAST
Glucagon	CONTACT LAB	2-3 weeks	N/A	See Report		pmol/L	N/A	CHARING CROSS	OVERNIGHT FAST
Growth Hormone	1 x gold	1 week	N/A	See Report		mg/L	N/A	LEEDS SJUH	

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Blood Endocrinology	Container	Turnaround Times		Reference Ranges	Variables	Units	Retention Time	Test performed	Special Conditions
		Routine	Urgent						
Gut Hormones	CONTACT LAB	2-3 Weeks	N/A	See Report		N/A	N/A	HAMMERSMITH	OVERNIGHT FAST
Human Chorionic Gonadotropin (HCG)	1 x gold	48 h	5 h	See Report		IU/L	5 days	IN HOUSE	
Insulin (and C-Peptide)	1 x gold	3-5 weeks	N/A	See Report		SEE REPORT	N/A	RSCH SURREY	
Insulin like growth factor	1 x gold	2 weeks	N/A	See Report		nmol/L	N/A	LEEDS SJUH	
LH	1 x gold	24 h	5 h	See Report	Follicular	IU/L	5 days	IN HOUSE	
		24 h	5 h	See Report	MALE	IU/L	5 days	IN HOUSE	
Oestradiol	1 x gold	24 h	5 h	See Report	Pre-menopausal	pmol/L	5 days	IN HOUSE	
		24 h	5 h	See Report	MALE	pmol/L	5 days	IN HOUSE	
PTH	1 x purple	24 h	5 h	See Report		pmol/L	5 days	IN HOUSE	
Progesterone	1 x gold	24 h	5 h	See Report	Mid Luteal	nmol/L	5 days	IN HOUSE	
Prolactin	1 x gold	24 h	5 h	See Report	FEMALE	mIU/L	5 days	IN HOUSE	
		24 h	5 h	See Report	MALE	mIU/L	5 days	IN HOUSE	
Renin	Lithium Heparin	Variable		See Report		nmol/L/h	N/A	LEEDS SJUH	Random sample to lab quickly
SHBG	1 x gold	2 weeks	N/A	See Report	FEMALE	nmol/L	N/A	IN HOUSE	
		2 weeks	N/A	See Report	MALE	nmol/L	N/A	IN HOUSE	
Testosterone (male)	1 x gold	24 h	5 h	See Report	MALE	nmol/L	5 days	IN HOUSE	
Testosterone (female)	1 x gold	1-2 Weeks	N/A	See Report	FEMALE	nmol/L	N/A	LEEDS SJUH	
Thyroglobulin	1 x gold	2-3 weeks	N/A	See Report		µg/L	N/A	NEWCASTLE	
Thyroid Stimulating Hormone (TSH)	1 x gold	24 h	5 h	See Report		mIU/L	5 days	IN HOUSE	
Drugs	Container	Turnaround Times		Reference Ranges	Variables	Units	Retention Time	Test performed	Special Conditions
		Routine	Urgent						
Caffeine	1 x gold	48 h	5 h			mg/L	2 days	Sheffield	

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Drugs	Container	Turnaround Times		Reference Ranges	Variables	Units	Retention Time	Test performed	Special Conditions
		Routine	Urgent						
Carbamazepine	1 x gold	3 weeks	N/A	See Report	Trough	mg/L	5 days	AIREDALE	
Digoxin	1 x gold	24 h	5 h	See Report	6-8HR POST DOSE	µg/L	5 days	IN HOUSE	
Lithium	1 x gold	24 h	5 h	See Report	12HR POST DOSE	mmol/L	5 days	IN HOUSE	
Paracetamol	1 x gold	24 h	5 h	See Report	>4HR POST DOSE	mg/L	5 days	IN HOUSE	
Phenobarbitone	1 x gold	1 week	N/A	See Report	Trough	mg/L	N/A	LEEDS SJUH	
Phenytoin	1 x gold	3 weeks	N/A	See Report	Trough	mg/L	5 days	AIREDALE	
Salicylate	1 x gold	24 h	5 h	See Report		mg/L	5 days	IN HOUSE	
Theophylline	1 x gold	24 h	5 h	See Report	Trough	mg/L	5 days	IN HOUSE	
Urine Drugs of abuse	Random plain urine	1 week	N/A	See Report		SEE REPORT	5 days	LEEDS SJUH	
Valproic Acid	1 x gold	1 week	N/A	See Report	Trough	mg/L	N/A	LEEDS SJUH	
Vancomycin	1 x gold	24 h	5 h	See Report		mg/L	5 days	IN HOUSE	TAKE PRIOR TO NEXT DOSE

Immunology	Container	Turnaround Times		Reference Ranges	Variables	Units	Retention Time	Test performed	Special Conditions
		Routine	Urgent						
Alpha 1-antitrypsin	1 x gold	2-3 weeks	N/A	See Report	Age Related	g/L	N/A	SHEFFIELD (RH)	
Anti-cardiolipin antibodies	1 x gold	1 week	N/A	See Report		GPLU/L	N/A	LEEDS SJUH	
Anti-Thyroid Peroxidase Antibody (ATPO)	1 x gold	24 h	5 h	See Report		IU/mL	5 days	IN HOUSE	
Antistreptolysin Titre (ASO)	1 x gold	1 week	N/A	See Report		IU/mL	N/A	LEEDS SJUH	
Beta 2-microglobulin	1 x gold	24 h	5 h	See Report		ng/mL	5 days	IN HOUSE	
C1-esterase inhibitor	1 x gold	1 week	N/A	See Report		g/L	N/A	SHEFFIELD (RH)	
C3 Complement	1 x gold	24 h	N/A	See Report		g/L	5 days	IN HOUSE	
C4 Complement	1 x gold	24 h	N/A	See Report		g/L	5 days	IN HOUSE	

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Immunology	Container	Turnaround Times		Reference Ranges	Variables	Units	Retention Time	Test performed	Special Conditions
		Routine	Urgent						
CA125	1 x gold	24 h	5 h	See Report		U/mL	5 days	IN HOUSE	
CA153	1 x gold	24 h	5 h	See Report		kU/L	5 days	IN HOUSE	
CA19-9	1 x gold	24 h	5 h	See Report		kU/L	5 days	IN HOUSE	
Carcinoembryonic Antigen (CEA)	1 x gold	24 h	5 h	See Report		µg/L	5 days	IN HOUSE	
Caeruloplasmin	1 x gold	2 weeks	N/A	See Report		g/L	N/A	LEEDS SJUH	
Cholinesterase Antibodies	1 x gold	2 weeks	N/A	See Report		IU/L	N/A	BRISTOL	
Cryoglobulins	1 x gold	7 Days	N/A	See Report		N/A	5 days	IN HOUSE	
Immunoglobulin E	1 x gold	48 h	N/A	See Report		IU/mL	5 days	LEEDS SJUH	
Immunoglobulin Sub-Classes	1 x gold	2 weeks	N/A	See Report		SEE REPORT	N/A	SHEFFIELD (RH)	
NSE	1 x gold	2 weeks	N/A	See Report		µg/L	N/A	SHEFFIELD (RH)	
Prostate Specific Antigen (PSA)	1 x gold	24 h	5 h	See Report	Age Related	ng/mL	5 days	IN HOUSE	
Immunoglobulin (IgG)	1 x gold	1 week	N/A	See Report	Age Related	N/A	5 days	IN HOUSE	
Immunoglobulin A (IgA)		1 week	N/A	See Report	Age Related	N/A	5 days	IN HOUSE	
Immunoglobulin M (IgM)		1 week	N/A	See Report	Age Related	N/A	5 days	IN HOUSE	
Dynamic Function Tests	Container	Turnaround Times		Reference Ranges	Variables	Units	Retention Time	Test performed	Special Conditions
		Routine	Urgent						
Glucose Tolerance Test (GTT)	CONTACT LAB	24 h	3 h	See Report		mmol/L	5 days	IN HOUSE	
Sweat Test	CONTACT LAB	24 h	N/A	See Report		SEE REPORT	N/A	BRADFORD (RI)	
Synacthen Test (short)	CONTACT LAB	24 h	5 h	See Report		nmol/L	5 days	IN HOUSE	

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Tests on Faeces	Container	Turnaround Times			Variables	Units	Retention Time	Test performed	Special Conditions
		Routine	Urgent						
Faecal Elastase	Plain	2 weeks	N/A	See Report		ugEI/g stool	N/A	YORK	
Faecal Immunochemical Test (FIT)	FIT Cassette	3 days	N/A	<10.0		ug Hb/g stool	5 days	IN HOUSE	

Common Reference Intervals (reference ranges)

Analyte	Unit	Reference Interval	Source
AFP	kU/L	0-6	Scottish Clinical Biochemistry Network (SCBN)
Albumin	g/L	0-1yr: 30-45, 1 - 17 yrs: 30-50, >17yrs: 35 - 50	Harmony (Pathology Harmony.co.uk - Harmonisation of Reference Intervals)2011
Albumin/Creatinine Ratio	mg/mmol	0.0 – 2.9	In line with NICE NG203 guideline. WYAAT Consensus
ALP	IU/L	Adult 30 - 130 & Paediatric age related ranges	Pathology Harmony 2011. Paed ranges from caliper study.
ALT	IU/L	Females 0-30, Male 0-40	WYAAT Consensus
Ammonia	umol/L	0 - 31 days < 100. > 31 days < 50	Paediatric: Pathology Harmony 2011. WYAAT consensus
Amylase	IU/L	0- 110	WYAAT Consensus
AST	IU/L	Female 0-30, Male 0-36	WYAAT consensus
Bile Acid	umol/l	0 - 6	Beckman IFU

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Analyte	Unit	Reference Interval	Source
Bicarbonate total	mmol/L	0 - 17yrs 19-28, >17yrs 22-29	Harmony (Pathology Harmony.co.uk - Harmonisation of Reference Intervals) 2011
BMG	mg/L	Age 0 - 60: 0.8 - 2.4.	Beckman IFU 2022
Complement C3	g/L	0.75 - 1.65	WYAAT Consensus
Complement C4	g/L	0.14 - 0.54	WYAAT Consensus
Ca125	u/ml	0 - 34.9	Nationally consensus cut-off
Ca15-3	Ku/L	0 - 23.5	Beckman IFU 2022
Ca19-9	ku/L	< 35	Beckman IFU 2022
Calcium (Adjusted)	mmol/L	0 - 28 days 2.00-2.70, 1 month old - 15years 2.20-2.70, > 15 2.20-2.60 years	Pathology Harmony
Calcium (Total)	mmol/L	0 - 28 days 2.00-2.70, 1 month old - 15years 2.20-2.70, > 15 2.20-2.60 years	Pathology Harmony
CEA	ug/L	0.0-5.0	Scottish Clinical Biochemistry Network (SCBN)
Cholesterol	mmol/L	Age and sex related - (clinical cut off is appropriate cut off for an individual is determined clinically based on patient risk factors)	International cut off historical / Tietz NW Fundamentals of Clinical Chemistry version 5
Creatine Kinase (CK)	IU/L	Female 25 - 200. Male 40 - 320	Pathology Harmony and Yorkshire Ref Range Study
Chloride	mmol/L	95-108	Harmony (Pathology Harmony.co.uk - Harmonisation of Reference Intervals) 2011

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Analyte	Unit	Reference Interval	Source
Conjugated Bilirubin	nmol/L	0-5	WYAAT consensus
Cortisol	nmol/L	185 - 624	Beckman IFU
Creatinine	umol/L	Age and gender related. Adult F: 49 - 90. Adult M: 64 - 104	Paed: Caliper Study. Adult Beckman IFU
C-Reactive Protein (CRP)	mg/L	0-10	WYAAT consensus
CSF Glucose	mmol/L	No reference range quoted	
CSF Protein	g/L	0.1 - 0.4	Tietz NW Fundamentals of Clinical Chemistry Version 3
Digoxin	ug/L	Target range: 0.5-1.0 For digoxin monitoring: sample must be taken at least 6 hour post dose.	Harmony (Pathology Harmony.co.uk - Harmonisation of Reference Intervals) 2011. WYAAT Consensus
Ferritin	ng/ml	30 - 337	Locally derived & WYAAT consensus. Lower limit defined by NICE as diagnostic of iron deficiency.
Folate	ug/L	5.4 - 24	Locally derived (Yorkshire RR study, WYAAT consensus)
FSH	IU/L	Male: 1.2 - 19.3. Female cycle Dependant, ranges given in associated comments.	Beckman IFU & WYAAT consensus
FreeT3	pmol/L	3.5 - 6.8	WYAAT consensus

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Analyte	Unit	Reference Interval	Source
FreeT4	pmol/L	7.8 - 18	Lower Limit: Beckman IFU 2022. Upper limit locally derived from verification data versus previous method.
Gamma GT	IU/L	Female 6 - 40, Male 12 - 68	WYAAT consensus
Glucose	mmol/L	Fasting 3.5 – 6.0	WYAAT consensus
HbA1c	mmol/mol	cut off	Internationally consensus cut off
HCG (Pregnancy)	IU/L	<5	WYAAT consensus & SCBN
HCG (Tumour)	IU/L	<5	WYAAT consensus & SCBN
Haptoglobin	g/L	0.3 – 2.0	Beckman IFU 2022
IgA	g/L	Paediatric age related. Adult 0.8 - 4.0	PRU Protein Reference Units Sheffield Teaching Hospitals (https://www.immqas.org.uk) WYAAT consensus
IgG	g/L	6 - 16	PRU Protein Reference Units Sheffield Teaching Hospitals (https://www.immqas.org.uk) WYAAT consensus
IgM	g/L	0.5 - 2.0	PRU Protein Reference Units Sheffield Teaching Hospitals (https://www.immqas.org.uk) WYAAT consensus
Iron	umol/L	Female: 9.0 - 30.4. Male: 11.6 - 31.3	WYAAT Consensus
Potassium (Plasma)	mmol/L	0 - 28 days: 3.4 - 6.0, 29 days - 12 months 3.5 - 5.7, 1 year - 16 years 3.5 - 5.0, ≥ 17 years 3.5 - 5.3	Pathology Harmony and Tietz NW Fundamentals of Clinical Chemistry version 7
Potassium (Serum)	mmol/L	0 - 2 days: 3.4 - 6.0. 29 days - 11 months: 3.5 - 5.7, 2yr - 15 yr 3.5 - 5.0, ≥ 16 3.5 - 5.3.	Harmony (Pathology Harmony.co.uk - Harmonisation of Reference Intervals) 2011. WYAAT Consensus
Lactate	mmol/L	0 - 2.0	WYAAT Consensus

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Analyte	Unit	Reference Interval	Source
LDH	IU/L	Adult Female < 247, male < 248. Paediatric age related.	Beckman IFU 2022
LH	IU/L	Male: 1.2 - 8.6. Female cycle Dependant, ranges given in associated comments.	Beckman IFU & WYAAT Consensus
Lithium	mmol/L	0.4-1.0	Harmony (Pathology Harmony.co.uk - Harmonisation of Reference Intervals) 2011
LDL		No reference range quoted	
Magnesium	mmol/L	0-28 days 0.6 - 1.0. Age > 28 days 0.7-1.0	Harmony (Pathology Harmony.co.uk - Harmonisation of Reference Intervals) 2011
Sodium	mmol/L	133-146	Harmony (Pathology Harmony.co.uk - Harmonisation of Reference Intervals) 2011
Oestradiol	pmol/L	Male: < 150. Female cycle Dependant, ranges given in associated comments.	Beckman IFU 2022 & WYAAT Consensus
Osmolality (serum)	mOsm/Kg	275-295	Harmony (Pathology Harmony.co.uk - Harmonisation of Reference Intervals) 2011
Paracetamol	mg/L	No range should be quoted	

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Analyte	Unit	Reference Interval	Source
Phosphate	mmol/L	Age related ≤ 28 days- 1.30-2.60, 28 day-12 months 1.30-2.4, 1- 16 years 0.9-1.80, >16 years 0.8-1.50	Harmony (Pathology Harmony.co.uk - Harmonisation of Reference Intervals) 2011
Prolactin	miu/L	Female: 70 - 566. Male: 60 - 278	Beckman IFU 2022 and IPS agreement
Progesterone	nmol/L	No range given	Comment aids interpretation. WYAAT agreement
Procalcitonin	ug/L	No reference range	Comment guides interpretation
PSA	ng/ml	Age related ≤ 49 years 0 - 2.49, 50-59 yrs: 0 - 3.49, 60-69yrs 0 - 4.49, ≥70 yrs: 0 - 6.49	WYAAT consensus, NICE guidance NG12
PTH (plasma)	pmol/L	1.3 - 9.3	Beckman IFU 2022
Rheumatoid Factor	IU/mL	0-14	Beckman IFU 2022
Serum Free Kappa chains	mg/L	3.30 - 19.40	Binding site , IFU
Serum Free lambda chains	mg/L	5.71 - 26.30	Binding site , IFU
Serum Free Kappa/Lambda Ratio		0.26 - 1.65	Binding site , IFU
SHBG	nmol/L	Age and gender related: Female 20 - 46: 18.2 - 135.5. Female ≥ 47 16.8 - 125.2 Male: 13.3 - 89.5	Beckman IFU 2022
Total Bilirbin	umol/L	0-21	Harmony (Pathology Harmony.co.uk - Harmonisation of Reference Intervals) 2011

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Analyte	Unit	Reference Interval	Source
Testosterone (Male)	nmol/L	8 - 30	Derived in-house
Theophylline	mg/L	0 - 28 days: 5.0 - 10.0. $\geq$ 28 days: 10.0 - 20.0	Harmony (Pathology Harmony.co.uk - Harmonisation of Reference Intervals) 2011
Troponin I	ng/L	< 17.6	Beckman IFU 2022
Total Protein	g/L	60 - 80	WYAAT consensus
TPO antibodies	IU/L	0 - 8	Beckman IFU 2022
Triglycerides	mmol/L	< 2.3	WYAAT consensus
TSH	mIU/L	0.2-4.3	WYAAT consensus
Uric Acid	umol/L	Female: 140 - 360. Male: 200-430	WYAAT consensus
Urine Calcium	mmol/24hrs	2.5-7.5	WYAAT consensus
Urine Creatinine (24hr)	mmol/L	No range should be quoted	No range should be quoted
Urine Potassium	mmol/L	No range should be quoted	No range should be quoted
Urine Sodium	mmol/L	No range should be quoted	No range should be quoted
Urine Phosphate	mmol/24 hrs	15 - 50	WYAAT consensus
Urine Uric Acid	mmol/day	1.5-4.5	Tietz NW Fundamentals of Clinical Chemistry version 7
Urea	mmol/L	0 - 28 days@ 0.8 - 5.5, 29 days - 11 months: 1.0 - 5.5, 12 months - 15 years: 2.5 - 6.5 Adults 2.5 - 7.8	WYAAT consensus & Pathology Harmony
Vitamin B12	ng/L	110 - 914	Derived in-house
Vitamin D	nmol/L	No reference range	Comment aiding interpretation added

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Referral Immunology

Investigation	Specimen required	Turnaround times		Reference Range	Comments, Special precautions.	Specimen retention time	Performed at
		Routine	Urgent				
Adrenal Abs	1 x gold	14 days*	n/a	Positive or Negative		n/a	LEEDS SJUH
Acetylcholine receptor Antibodies	1 x gold	14 days*	n/a	Neg: $< 5 \times 10^{-10}$ mol/L Low Positive: $5-10 \times 10^{-10}$ mol/L Positive: $> 10 \times 10^{-10}$ mol/L		n/a	ORH
Anticardiolipin Abs	1 x gold	14 days*	n/a	0 – 19.9 GPL Units / mL		n/a	LEEDS SJUH
Anti DNA – now part of ANA Screen (Leeds)	1 x gold	14 days*	n/a		Request ANA Screen (Leeds) on ICE	N/A	LEEDS SJUH
Anti-neutrophil cytoplasmic Abs (Screen plus MPO, PR3 and pattern if applicable)	1 x gold	14 days*	(2 days)	Positive or Negative for screen, numerical report for ANCA MPO and PR3 (Ref range TBC)	Request ANCA Screen (Leeds) on ICE	N/A	LEEDS SJUH
Antinuclear Abs	1 x gold	2 weeks* 4 weeks* (Titre)	n/a	Pattern if appropriate	Request ANA Screen (Leeds) on ICE	N/A	LEEDS SJUH

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Investigation	Specimen required	Turnaround times		Reference Range	Comments, Special precautions.	Specimen retention time	Performed at
		Routine	Urgent				
Cyclic Citrullinated Peptide (CCP) Abs.	1 x gold	48 hours*	n/a	0<16 U/mL		5 Days	Airedale
Endomysial Abs.	1 x gold	14 days*	n/a	Negative / Positive IgA class	Only tested on Positive TTGs	N/A	LEEDS SJUH
EPO	1 X gold	4 weeks*	n/a			N/A	LEEDS SJUH
Extractable Nuclear Antigens – Request ANA Screen (Leeds)	1 x gold	4 weeks*	n/a		Now included in ANA Screen (Leeds) on ICE	N/A	LEEDS SJUH
Glutamic Acid Decarboxylase Abs. (GAD)	1 x gold	4 weeks*	n/a	0 – 5 U/mL		n/a	ORH
Glomerular Basement Membrane Abs. (GBM)	1 x gold	2 Weeks*	2 hrs once sample received at LEEDS SJUH.	< 0.9 AI = Negative > 1.0 AI = Positive	Urgent samples by prior arrangement only	n/a	LEEDS SJUH
Intrinsic Factor Abs.	1 x gold	14 days*	NA	Positive / Negative / Equivocal		n/a	Airedale
Liver Antibody Screen	1 x gold	2 weeks*	n/a	Negative / Positive	For AMA, SMA, LKM and GPC antibodies	N/A	LEEDS SJUH

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Investigation	Specimen required	Turnaround times		Reference Range	Comments, Special precautions.	Specimen retention time	Performed at
		Routine	Urgent				
Pemphigus Abs.	1 x gold	14 days*	n/a	Negative / Positive (+ titre)		n/a	LEEDS SJUH
Pemphigoid Abs.	1 x gold	14 days*	n/a	Negative / Positive (+titre)		n/a	LEEDS SJUH
Paraneoplastic Neurological Syndrome antibodies (PNSS)	1 x gold	14 days* (screen) 28 days (profile)	n/a	Positive, Negative or Equivocal	Full Profile will be performed on Positive and equivocal screens	n/a	LEEDS SJUH
Tissue Transglutaminase	1 x gold	14 days*	n/a	Negative Weak Positive/Positive		n/a	LEEDS SJUH
Micro move Aspergillus antibodies	Gold	10	N/A	Advice provided by reference laboratory on final report where applicable Reference range quoted: >39.9 mg/L is likely to indicate aspergillosis. In CF patients >89.9 mg/L is likely to be significant		n/a	LEEDS SJUH*
Micro move Avian antibodies	Gold	10	N/A	Advice provided by reference laboratory on final report where applicable Reference range quoted: ≥10 mg/L for pigeon serum ≥8 mg/L for budgie serum considered significant		n/a	LEEDS SJUH

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Investigation	Specimen required	Turnaround times		Reference Range	Comments, Special precautions.	Specimen retention time	Performed at
		Routine	Urgent				
Functional antibodies - Tetanus antibodies	Gold	21	N/A	Advice provided by reference laboratory on final report where applicable Inadequate: <0.01 IU/mL Sub optimal: 0.01 – 0.15 IU//mL Adequate: >0.15 IU/mL			LEEDS SJUH
Functional antibodies - Pneumococcal antibodies	Gold	21	N/A	Advice provided by reference laboratory on final report where applicable Inadequate: <10 ug/mL Sub optimal: 10-30 ug/mL Adequate: >30 ug/mL			LEEDS SJUH
Functional antibodies - Haemophilus antibodies	Gold	21	N/A	Advice provided by reference laboratory on final report where applicable Inadequate: <0.1 ug/mL Sub optimal: 0.15 – 1.0 ug/mL Adequate: >1 ug/mL			LEEDS SJUH

*

All test turnaround time for Immunology at LEEDS SJUH have been temporarily increased by approx. an extra 21 days on top of quoted time frames

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HAEMATOLOGY & BLOOD TRANSFUSION

Laboratory Staff Contact Details

Name	Job Title	Tel.No / Bleep / Pager	Email
Mrs Rebecca Parish	Pathology General Manager - IPS Blood Sciences & Harrogate site	01423 55 5842 07773 948767	rebecca.parish2@nhs.net
Mrs Aldyth Storey	IPS Haematology Service Lead	07773 962616	aldyth.storey@nhs.net
Mrs Paula Mitchell	IPS Blood Transfusion Service Lead	07471814475	Paula.mitchell4@nhs.net
Mrs Aimee Maud	Advanced BMS – Section Manager Haematology	01423 55 3068	Aimee.maud1@nhs.net
Mrs Rachael McGuirk	Advanced BMS – Blood Transfusion	01423 55 3070	rachael.mcguirk@nhs.net

Contacts for Advice and Clinical Interpretation

Name	Job Title	Area of responsibility	Tel.No / Bleep / Pager	Email
Dr Emma Harris	Specialty Lead	Haemostasis and Blood Transfusion	01423 55 2218	emma.harris32@nhs.net
Dr Claire Hall	Consultant	General Haematology	01423 55 3062	Claire.Hall24@nhs.net
Dr James Wilson	Consultant	General Haematology	01423 55 2271	James.wilson21@nhs.net
Dr Alesia Khan	Consultant	General Haematology	Via Haematology secretaries 01423 55 7323	alesia.khan@nhs.net
Dr Marketa Wilson	Consultant	General Haematology	01423 55 3067	Marketa.Wilson@nhs.net
Dr Paul Moreton	Consultant	General Haematology	0142355 5746	p.moreton1@nhs.net
On call Haematologist	Spr or Consultant Haematologist		Via HDFT switchboard	
Mrs Faye Smith	Transfusion Practitioner	Clinical Transfusion	01423 55 5628	faye.smith15@nhs.net
General Blood Sciences queries		Pathology Helpdesk		hdft.pathology-helpdesk@nhs.net
Results returned service		Pathology Admin		hdft.pathology-helpdesk@nhs.net

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Haematology Phone List

These phone levels apply only to unexpected results, that is those who have not had raised levels previously and are not known to have a disease where these levels would be expected

Parameter	Telephone trigger	Notes
Hb	Less than 70g/l Greater than 190 g/l and /or HCT above 0.55	also provide MCH & MCV results
Neuts	< 1.0 x 10 ⁹ /l	
Platelets	< 30 x 10 ⁹ /l > 1000 x 10 ⁹ /l	
Film	Blast cells or film suggestive of CML	Contact Consultant Haematologist
Malaria	Any positive results	
Sickle solubility	All results	For all in house testing
INR	> 5.0	All high results even if previously abnormal.
INRD	>6.0	Pharmacy INR ONLY
APTT ratio	> 5.0	Patients on heparin only
DD	>230ng/ml (age related cut off of year in age*5 ng/ml if patient is over 50 years)	Phone all over range DD results to GP surgeries, unless the patient is on Rivaroxaban.
FIB C	<1.5g/L	With major blood loss
ESR	>50mm/hr	Unexplained or with clinical details ? TA/Giant cell arteritis
All AE and SDEC Problem codes	All AE and SDEC problem codes e.g. clotted, unlabelled, insufficient	All problem sample codes should be telephoned to AE or SDEC

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Haematology & Blood Transfusion Investigations

The following list of available tests is not exclusive and other tests may be available on request.

Please note that where EDTA (purple) tubes are required this is K3 EDTA.

Investigation	Specimen required	Turnaround times		Reference Range	Comments, Special precautions.	Specimen retention time	Performed at
		Routine	Urgent				
Activated Partial Thromboplastin time (APTT) *	1 x blue	4 hours	1 hour	21 - 32 s		24 hours	HDH
APTT Ratio – Heparin monitoring	1 x blue	4 hours	1 hour	(Therapeutic range 1.5 – 2.0 or 1.5 – 2.5 depending upon indication)	Not for monitoring LMWH	24 hours	HDH
Anticardiolipin Abs	1 x gold	14 days	n/a	0 – 19.9 GPL Units / mL		n/a	LEEDS SJUH
Apixaban (anti-Xa) **	1 x blue	4 hours	1 hour	No range quoted		24 hours	HDH
Ascitic Fluid WBC/Differential	1 x purple	4 hour	1 hour		Differential not possible on WBC counts under $1.0 \times 10^9/L$	24 – 48 hours	HDH
Blood Film	Consultant advice required	1 day	1 hour	Descriptive report issued	Consultant advice required	7 days	HDH

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Investigation	Specimen required	Turnaround times		Reference Range	Comments, Special precautions.	Specimen retention time	Performed at
		Routine	Urgent				
Antibody investigation	2 x pink (6 ml)	2 weeks	8 hour	Descriptive report issued	Ensure fully labelled with 3 points of ID Time/date and signature	N/A	NHSBT Barnsley
Blood Group and Screen / Cross match	1 x pink (6 ml)	1 day	1 hour	Descriptive report issued for Group and Screen	Ensure fully labelled with 3 points of ID Time/date and signature	14 days	HDH
Bone marrow aspirate & trephine	Consultant advice required	1 week	1 week	Descriptive report issued	By prior arrangement only	n/a	HMDS
Coagulation Screen (PT & APTT)	1 x blue	4 hours	1 hour	See PT & APTT		24 hours	HDH

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Investigation	Specimen required	Turnaround times		Reference Range	Comments, Special precautions.	Specimen retention time	Performed at
		Routine	Urgent				
D-dimers	1 x blue	4 hours	1 hour	<230ng/ml	<230 ng/mL (or < age adjusted cut off) is a negative predictor for VTE. Results NOT suitable as a positive indicator for VTE. Age adjusted cut off (over 50s only) = Age in years x 5.	24 hours	HDH
Direct Coombs Test	1 x pink (6 ml) or purple (4 ml)	1 day	1 hour	Negative / Positive (IgG +/- C3d)	Must be tested within 48 hours of sample taken.	14 days	HDH
EPO	1 X gold	4 weeks	n/a			N/A	LEEDS SJUH

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Investigation	Specimen required	Turnaround times		Reference Range	Comments, Special precautions.	Specimen retention time	Performed at
		Routine	Urgent				
Erythrocyte Sedimentation rate (ESR)	1 x purple	48 hours	90 minutes	Females: 0-14mm/h Males: 0-10mm/h	Samples must reach the blood science laboratory within 4 hours of collection	48 hours	HDH
Fetal Rh(D) Screening	1 x pink	14 days	n/a	Positive/Negative/ Inconclusive	Fully labelled with at least 3 points of ID Sign and date/time sample. EDD from scan must be on request form	N/A	IBGRL
Fibrinogen *	1 x blue	4 hours	1 hour	1.5 – 4.5g/L		24 hours	HDH
Full Blood Count	1 x purple	4 hours	1 hour	See report		24 - 48 hours	HDH
Glandular fever Screen	1 x purple or gold 1 x gold	24 hours	1 hour	Positive / Negative		24 hours	HDH
Glucose-6-phosphate dehydrogenase (G6PD)	2 x purple	2 weeks	1 week			n/a	LTHT

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Investigation	Specimen required	Turnaround times		Reference Range	Comments, Special precautions.	Specimen retention time	Performed at
		Routine	Urgent				
Haemoglobin Electrophoresis	1 x purple	5 days	3 days	See report		n/a	LTHT
Heparin Induced Thrombocytopenia Screen (HIT-type II)	1 x gold 1 x blue	4 days	1 day	Negative / Positive	By prior arrangement only	n/a	LTHT
HLA B27	2 x purple (2 x 4 ml)	2 Weeks	n/a	Ag Negative / Ag Positive	Fully labelled with at least 3 points of ID. Sign and date/time sample.	n/a	NHSBT Barnsley
HLA for Narcolepsy	2 x purple (2 x 4 ml)	2 Weeks	n/a	Negative / Positive	Fully labelled with at least 3 points of ID. Sign and date/time sample.	n/a	NHSBT Barnsley
INR (Warfarin monitoring)	1 x blue	4 hours	1 hour	Therapeutic Range Depends upon indication		24 hours	HDH

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Investigation	Specimen required	Turnaround times		Reference Range	Comments, Special precautions.	Specimen retention time	Performed at
		Routine	Urgent				
JAK 2	Contact laboratory (3068)	6 weeks	5 weeks	See report	By prior arrangement only	n/a	HMDS
Kleihauer	2 x pink	1 day	n/a	Neg = <2mL	Fully labelled with at least 3 points of ID Sign and date/time sample	14 days	HDH
Low molecular weight heparin (anti-Xa) **	1 x blue	4 hours	1 hour	No range quoted		24 hours	HDH
Malarial Parasites	1 x purple	4 hours	2 hours	Negative / Positive (plus species identification)	Record country visited & any prophylaxis on request form		HDH
Plasma Viscosity	1 x purple	72 hours	5 hours	1.5 – 1.72 mPa/s			LTHT
Platelet Abs.	Contact laboratory (3068)	7 – 10 days	3 days	Descriptive report issued	By prior arrangement only	n/a	NHSBT Barnsley

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Investigation	Specimen required	Turnaround times		Reference Range	Comments, Special precautions.	Specimen retention time	Performed at
		Routine	Urgent				
Pleural Fluid WBC/Differential	1 x purple	4 hours	1 hour				HDH
Prothrombin time (PT) *	1 x blue	4 hours	1 hour	9.0 – 14.0 s	(For Warfarin monitoring request INR)	24 hours	HDH
Reticulocytes	1 x purple	4 hours	1 hour	30-100 x 10 ⁹ / L		24 hours	HDH
Rivaroxaban (anti-Xa) **	1 x blue	4 hours	1 hour	No range quoted		24 hours	HDH
Sickle Cell Screen	1 x purple	5 days	2 hours	Positive / Negative (All samples sent to LTHT for confirmation)		24 – 48 hours	HDH/ LTHT
Thrombin Time	1 x blue	4 hours	1 hour	10 – 17 secs		24 hours	HDH
Thrombophilia / Lupus anticoagulant screen	Contact laboratory (3068) to arrange	6 weeks	5 weeks	See report for reference ranges.	By prior arrangement only	n/a	LTHT
Tissue Typing (full)	Contact laboratory to arrange	2 weeks	n/a	Descriptive report issued	By prior arrangement only	n/a	LTHT

THIS IS A CONTROLLED DOCUMENT IF PRINTED RED

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Investigation	Specimen required	Turnaround times		Reference Range	Comments, Special precautions.	Specimen retention time	Performed at
		Routine	Urgent				
Transfusion Reaction Investigation	1 x pink, 1 x red top (no gel, plain tube)	1 day	N/A	Descriptive report issued	Fully labelled with at least 3 points of ID. Sign and date/time sample.	14 days	HDH

* Some components of the haemostatic system are influenced by hormonal and other factors and change during childhood, not reaching adult values until late teenage years. Other components are at adult levels, or even above adult levels from birth. Interpreting the results of haemostatic testing must always be done in the light of the clinical setting and the result alone must not be the only consideration when results are reviewed and reported.

** Specimens for coagulation tests should be tested within 4 hours of collection.

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Full Blood Count Reference Intervals (Reference ranges)

ANALYTE	UNITS	AGE RANGE	REF RANGE	SOURCE/COMMENTS
Haemoglobin	g/L	0-13 days 2-13 weeks 13 weeks – 1 year 1-12 years >12 (female) >12 (male)	130-206 95-140 105-140 115-150 120-160 130-180	Adult (>12 years) reference range locally derived. Paediatric (<12 years) harmonised with Leeds in 2024* with consultant haematologist agreement to apply adult reference range at 12 years old.
White Cell Count	X 10 ⁹ /L	< day 1 Days 1-2 Day 3-6 Weeks 1-6 Weeks 6-14 < 1 year 1-6 years 6-11 years 11-12 years >12 years	10-25 9-15 5-21 7-15 6-15 6-16 6-14 4.5-13.5 4-11 3.6-11	Adult (>12 years) reference range locally derived. Paediatric (<12 years) reference range harmonised with Leeds in 2024*.
Platelets	X 10 ⁹ /L	All ages	140-450	Harmonised with Airedale and Bradford in 2024
Haematocrit	L/L	< 2 weeks 2-14 weeks 14-52 weeks 1-5 years 5-12 years >12 years (female) >12 years (male)	0.42-0.6 0.32-0.44 0.33-0.44 0.36-0.44 0.35-0.45 0.37-0.48 0.4-0.52	Adult (>12 years) reference range harmonised with Airedale and Bradford in 2024. Paediatric (<12 years) reference range harmonised with Leeds in 2024*
RBC Count	X 10 ¹² /L	<14 days 2-13 weeks 13 weeks-1 year 1-4 years 4-12 years >12 years (female) >12 years (male)	4-6 3.2-4.8 3.6-5.2 4.1-5.5 4.0-5.4 3.8-5.8 4.5-6.5	Adult (>12 years) reference range locally derived. Paediatric (<12 years) reference range harmonised with Leeds in 2024*
Mean cell volume (MCV)	fl	<15 days 15 days-14 weeks 14 weeks-5 years 5 years-12 years >12 years	100-115 85-105 71-90 77-94 81-101	Adult (>12 years) reference range locally derived. Paediatric (<12 years) reference range harmonised with Leeds in 2024*

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Mean cell haemoglobin (MCH)	pg	<15 days 15 days-2 years 2 years-13 years >13 years	32-39 23-31 24-30 27-32	Adult (>13 years) reference range locally derived. Paediatric (<13 years) reference range harmonised with Leeds in 2024.*
Red Cell distribution width (RDW)	%	All ages	10-16	Locally derived reference range. RDW, as an all age reference range, was excluded in the paediatric harmonisation with Leeds in agreement with consultant haematologists.
Mean cell haemoglobin concentration(MCHC)	g/L	<12 years >12 years	310-370 320-370	Adult (>12 years) reference range locally derived. Paediatric (<12 years) reference range harmonised with Leeds in 2024*
Neutrophils	X 10 ⁹ /L	<14 days 2-1 year 1-10 years 10-12 years >12 years	1.5-10 1.5-7 2-6 2-7.5 1.8-8	Adult (>12 years) reference range locally derived. Paediatric (<12 years) reference range harmonised with Leeds in 2024*
Lymphocytes	X 10 ⁹ /L	0-2 weeks 2-14 weeks 14 weeks-2 years 2-4 years 4-7 years 7-11 years 11-12 years >12 years	2-16 4-12 4-10 2.5-8 2-8 1.5-4.5 1-4.5 1-4	Adult (>12 years) reference range locally derived. Paediatric (<12 years) reference range harmonised with Leeds in 2024*
Monocytes	X 10 ⁹ /L	<14 days 2 weeks-10 years 10-12 years >12 years	0.3-1.5 0.2-1.5 0.2-0.8 0.3-0.9	Adult (>12 years) reference range locally derived. Paediatric (<12 years) reference range harmonised with Leeds in 2024*
Eosinophils	X 10 ⁹ /L	<14 days 14 days-12 years >12 years	0.2-0.9 0.04-0.4 0.04-0.5	Adult (>12 years) reference range locally derived. Paediatric (<12 years) reference range harmonised with Leeds in 2024*
Basophils	X 10 ⁹ /L	All ages	0-0.1	Locally derived reference range
Nucleated red blood cells (NRBC)	X 10 ⁹ /L	All ages	0-0.01	Locally derived reference range
Reticulocytes, absolute	X 10 ⁹ /L	<14 days >14 days	100-250 30-100	>14 days reference range locally derived. <14 days is unknown source but used historically and was excluded from the paediatric harmonisation with Leeds

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				due to Leeds reference range being an all age reference range.
Reticulocyte haemoglobin	Pg	All ages	>28	Harmonised with York (shared care for renal patients) and locally verified in 2021.

* Paediatric FBC reference ranges were harmonised with Leeds in October 2024 as part of the WYAAT-wide joint LIMS project. Leeds FBC paediatric reference ranges are based on Hall and Malia, Medical Laboratory Haematology (1984) with additional method specific paediatric ranges as described by Hinchcliffe and Lilleyman, Practical Paediatric Haematology: A laboratory Worker's guide to blood disorders in children (1987). Reviewed using Dacie & Lewis, Practical Haematology 10th edn (2006). Comparability assessed with V&V 2011

Adding on extra tests

Add on requests for D-Dimer, APTT and Fibrinogen can be requested up to 4 hrs after the original request has been received in the laboratory. Add on requests for Reticulocytes or blood films for morphology can be requested up to 24 hours after the original request has been received in the laboratory.

To add on extra tests please call specimen reception on ext 3000 and send an add on ICE request. See Appendix 3 for further information on time limits affecting add-on tests.

Factors affecting test performance

1. Wrong container used
2. Wrong sample type for investigation required
3. Delay in transportation and transport conditions
4. Volume of specimen
5. Poor quality specimens

Reference Laboratory Addresses

Please request information from the Pathology laboratory regarding referral laboratories.

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BLOOD TRANSFUSION

Blood Transfusion Requests

The appropriate samples should be accompanied by the Blood Transfusion Request Form; an ICE request form should be used whenever possible.

Transfusion sample expiry

Transfusion samples are valid for crossmatching for 7 days. However, if the patient is currently pregnant, has been pregnant within the last three months, or has been transfused within the past three months, the sample is only valid for 3 days. All samples are retained in the laboratory for 14 days from the date of collection.

Blood Transfusion Practitioner Role

The blood transfusion practitioner is based in the transfusion department and has primary responsibility for the education and competency assessment in accordance with the National Patient Safety Agency (NPSA) of key clinical staff involved in the transfusion process. Other fundamental aspects of the post involve improving transfusion safety and ensuring appropriate blood use. This is achieved by audit, investigation of incidents, production of policies and protocols and acting as a resource in transfusion matters for clinical staff. An important function of the post is to act as liaison between the clinical areas and the transfusion department to facilitate communication between the two areas.

Assistant Transfusion Practitioner Role

The Assistant Transfusion Practitioner primarily assists the Transfusion Practitioner in traceability of blood products, performing audit, administrative support and performs the competency assessments of clinical staff in blood collection. They also act as a resource for the clinical staff where possible in the absence of the transfusion practitioner.

HARROGATE HEALTH CARE BLOOD TRANSFUSION POLICY

Sample Collection and Request

Requests for blood and blood products should be made on the ICE requesting system or on Blood Transfusion request forms. Telephone requests for blood products can be made over the phone on x3069 or bleep 3066 out of hours.

Sample tubes must be hand-written on the bottle with all necessary identification **by the bedside**. Sample bottles must contain the following details in order to comply with guidelines set down by the British Committee for Standards in Haematology.

1. **FULL NAME (Spelt Correctly)**
2. **DATE OF BIRTH (NOT AGE)**
3. **UNIQUE HOSPITAL NUMBER / NHS number**
4. **SAMPLE DATE AND TIME**
5. **SIGNATURE OF THE PERSON TAKING THE SAMPLE**

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Unknown Patients

If the patient details are unknown or the patient is unwilling to give their identity, a temporary patient identity should be used. This will ensure that a patient can be positively identified in situations where two or more unknown patients are present.

Patients **MUST** be allocated with:

- A hospital number
- A first name and surname from the phonetic alphabet
- An estimated DOB
- A patient gender

The surname will be prefixed by a unique number on the wristband e.g. BLT3475Bravo.

The patient ID must also be on the wristband allowing Blood and Blood Products to be checked prior to infusion.

Blood Storage

Blood should only be stored in monitored blood bank refrigerators, **NEVER** in domestic or drug fridges on wards. Monitored blood bank refrigerators can be found at the following sites.

- Blood Transfusion Dept, Fewston Wing
- SROMC
- Delivery Suite

Transfusion of Blood on Wards and in Theatres

All transfusions must be undertaken using the transfusion care pathway documentation. This contains the protocol for transfusion administration, consent and blood authorisation. **Prior** to commencement of transfusion, two registered staff (Medical staff, ODP, midwife, registered nurse) must check the following details:

- PATIENT'S FULL NAME
- PATIENT'S DATE OF BIRTH
- PATIENT HOSPITAL NUMBER & NHS number
- PATIENT'S BLOOD GROUP
- BLOOD GROUP OF DONOR BAG
- DONATION NUMBER OF BAG
- EXPIRY DATE OF BLOOD/PRODUCT

They must be checked against:

- THE BLOOD BAG LABELS
- THE BLOOD BAG ITSELF
- PATIENT ID FROM THE MEDICAL NOTES
- THE PATIENT'S IDENTIFICATION BRACELET

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- VERBAL CONFIRMATION OF THE PATIENT'S NAME AND DATE OF BIRTH WHERE POSSIBLE

It is the responsibility of the qualified member of staff to ensure these checks are carried out at the **patient's bedside** and that the unit of blood / product is then commenced immediately for transfusion.

REMEMBER! TRANSFUSION OF THE WRONG BLOOD COULD KILL

Blood should never be heated unless a doctor in charge of the case considers that it is necessary using controlled blood warming apparatus. Never add drugs or other substances to blood or blood products.

Emergency Group O Rh (D) Negative Blood & O Rh(D) Positive Blood

Emergency units of blood are available at the following sites:

- Two O RhD negative units in the Fewston Blood Transfusion fridge
- Two O RhD negative units in the Delivery Suite Blood Bank fridge.
- One O RhD negative paediatric unit in the Delivery Suite Blood Bank fridge.
- Two units O RhD positive units are available in the Blood Transfusion Department and will be released for suitable patients by the lab staff.

The emergency units should only be used in severe cases of bleeding where there is insufficient time to await for blood from the laboratory. A group and save sample must always be taken from the patient prior to transfusion and dispatched to the laboratory as soon as possible.

Transfusion Reactions (see Blood Transfusion care pathway)

If a patient appears to have had a severe transfusion reaction, the care pathway transfusion reaction flow chart should be followed and a Datix incident form must be completed at the earliest opportunity. The blood bag should be sealed to prevent leakages and returned to the Blood Transfusion Department. The samples required for investigating a transfusion reaction are found on ICE under 'Transfusion reaction'.

Transport of Blood

When blood is taken to another hospital outside HDFT e.g. to, Leeds or York, it is important that documentation shows how long the blood has been out of a blood bank refrigerator. The blood must remain in cold storage during transit. Blood is always transported in a designated insulated box. Contact the laboratory on ext. 3069 or bleep 3066 out of hours, so that the blood can be packed with all the correct documentation. The documentation must be completed before despatch and on reaching the destination Blood Bank.

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Blood Products

The following blood products are available on request from the Blood Transfusion Department:

Fresh Frozen Plasma (FFP) and Cryoprecipitate

(See the FFP & Cryo guidelines, HDFT document library)

FFP and Cryoprecipitate are used to correct clotting factor deficiencies. Usually a clotting screen is required before issue. Advice or permission from a Consultant Haematologist may be required in some cases before these products are issued. FFP and Cryo do not require cross matching, but a sample will be required to ascertain the patients' blood group if it has not already been done. These products take up to 40 minutes to thaw and should be used as soon as possible to give maximum effect. FFP should not be used for the reversal of Warfarin overdose (see Trust policy Guidelines for reversal of oral anticoagulant drugs (warfarin, dabigatran and rivaroxaban))

Platelet Concentrate

(See Trust policy: Trust Platelet Transfusion Guidelines and Guidelines for the use of red cell and platelet transfusions in Haematology and Oncology patients).

Advice and permission for the use of platelet concentrates will normally come from a Consultant Haematologist. Platelets do not need cross matching, but a valid sample will be required. Platelets are obtained as required from the Regional Blood Transfusion Centre, Barnsley. This usually takes 1-2 hours. They should be transfused immediately for maximum effect. If not for immediate transfusion they should be kept in the laboratory at room temperature on a platelet agitator. Platelets may be obtained in an emergency from the NHSBT in Barnsley and transported here under a blue light. However the requesting consultant's name is required by the NHSBT for authorisation. Platelets should NEVER be stored in a refrigerator.

Prothrombin Complex Concentrate (PCC/Beriplex)

For the treatment of life-threatening bleeding related to warfarin overdose. See the Trust policy: Guidelines for reversal of oral anticoagulant drugs (warfarin, dabigatran and rivaroxaban). Strict criteria for the use of PCC must be adhered to. The Emergency Department additionally holds a stock of PCC for Emergency Use.

Activated Factor Seven (NovoSeven)

An emergency supply is available for use in extreme circumstances where there is life-threatening bleeding and a specific platelet or coagulation defect cannot be detected and reversed. This is an unlicensed indication for the use of this product and can only be prescribed with the agreement of a consultant haematologist.

Novoseven is licensed for use in patients with factor VIII inhibitors but such patients will usually be treated at St James's University Hospital, Leeds.

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Human Albumin Solutions (HAS)

A stock of 20% 100ml HAS is held in the Blood Transfusion Department and is issued on a named patient basis as required. The following clinical areas hold stock of HAS in their omniceils; Nidderdale (20), ICU (20), Bolton (20), Wensleydale (5).

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MICROBIOLOGY

Includes microbiology, serology and virology.

Scope of work

The ranges of tests include bacteriology, molecular microbiology, parasitology, mycology, serology and virology.

Introduction

All microbiology specimens should be submitted to the Microbiology Department at HDH. In this way a record of results can be held here, whether the specimens are examined locally or sent away to reference laboratories. This is important to allow the Consultant Microbiologist to maintain an overview of IPC issues or unusual patterns of antimicrobial resistance.

The repertoire of tests performed in our laboratory is under continual review, with the intention of developing the service appropriately according to the scale of demand and as circumstances and funding permit. The comments on specimens and tests (see tables 1 and 2) are intended to be a helpful guide to good use of the laboratory. They do not show the full extent of the laboratory repertoire, which is subject to alteration from time to time.

Location

The Microbiology laboratory is located on the 2nd floor of Fewston Wing at Harrogate District Hospital. The laboratory can only be accessed through a swipe card security system, so visits must be arranged with the laboratory in advance.

Department contact details

Name	Tel.no./ bleep	Email
Microbiology Reception and Enquiries	01423 553078	
Dr Katharine Scott Consultant Microbiologist & Specialty Lead	01423 555658	katharine.scott1@nhs.net
Dr Lauren Heath Consultant Microbiologist & Infection Control Doctor	01423 554616	lauren.heath8@nhs.net
Dr Sarah Drake Consultant Microbiologist	01423 553077	sarah.drake3@nhs.net
Dr Alison Muir Consultant Microbiologist	01423 555674	alison.muir9@nhs.net
Janet Bingham PA to Consultant Microbiologists/ Secretary	01423 555663	janet.bingham@nhs.net

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Name	Tel.no./ bleep	Email
Mr Mohammad Rizwan Pathology General Manager - IPS Microbiology & Airedale site	07773 941075	Mohammad.rizwan2@nhs.net
Mr James Wootton IPS Microbiology Service Lead	07773 539042	James.wootton2@nhs.net
Miss Helen Kirrane Advanced BMS – Section Manager	01423 553075	helen.kirrane@nhs.net

Clinical Advice

The Consultant Microbiologists are happy to discuss investigation, diagnosis and treatment of patients with suspected infection. A Duty Consultant Microbiologist (Consultant and/or Registrar) is available on-site between 9am and 5pm. Switchboard (01423 885959) can advise both external and internal users which Microbiologist is on duty.

Antibiotic treatment and prophylaxis guidelines are available via the Eolas app.

Out-of-Hours Service

There is 24 hour year round availability of microbiology clinical advice. A Consultant Microbiologist can be contacted via switchboard (01423 885959) for both external and internal users.

Urgent specimens: should be discussed with the on-call Biomedical Scientist (BMS) if urgent processing is required.

The on-call BMS may be contacted via the hospital switchboard (01423 885959) up until 9pm weekdays and weekends. Urgent work is usually restricted to the following samples:

- CSF
- Joint fluid
- Other fluids from normally sterile sites
- Deep tissue abscess
- Paediatric urine microscopy on children <3 months.

Specimens must be received by 20:30 to guarantee processing out of hours.

From 21:00 until 09:00 there is no on-site BMS. Between the hours of 20:30 and 06:00 specific requests (e.g. for sterile fluids and CSF) can be made on ICE for sending to AGH overnight for testing. Specimens received after 06:00 will be processed at 09:00.

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Rectal swabs for CPE testing are not processed out of hours. CPE requests can be processed until 16.30 Monday - Friday and 11.00 Saturday, Sunday and bank holidays.

Faeces for *C. difficile* testing are not tested out of hours. Ward *C. difficile* requests can be processed until 17.30 Monday-Friday and 11.00 Saturday, Sunday and bank holidays.

All other requests will only be considered after a discussion with the on-call Consultant Microbiologist.

Specimen requests

Clinicians should try to ensure that laboratory tests are only requested when a result is likely to make a difference to the management of a patient. Unnecessary tests can waste much laboratory, nursing and portering time and can lead to unnecessary antibiotic treatment if results are not assessed critically.

To obtain maximum diagnostic value from the specimen submitted, it is essential to provide adequate information about the patient, the clinical findings and current or proposed antibiotic treatment. Incomplete data may result in significant delays and/ or inappropriate processing. When received in the laboratory, each specimen is judged on its merits and examined according to the information supplied.

Factors affecting test performance

1. Wrong container/swab used
2. Wrong sample type for investigation required
3. Delay in transportation resulting in incorrect storage – see 'transportation of specimens'.
4. Volume of specimen - see table starting on page 71
5. Timing of specimen
 - a. prior administration of antimicrobials (if possible send specimens before commencing antimicrobial therapy)
 - b. antibiotic assays (see link in 'antibiotic assays' section)
6. Poor quality specimens e.g. blood cultures contaminated with skin flora due to inadequate skin disinfection, submission of saliva rather than sputum.

Specimen Type

When there is doubt about which tests to request, which specimens to take and which containers to use, please contact the laboratory. In difficult or unusual cases the Microbiologists would be pleased to advise on differential diagnosis, further investigations and antibiotic therapy.

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Transportation of specimens

All specimens must be received in appropriate containers, sealed in a plastic bag with the request form in a separate compartment. Rapid transportation of microbiology specimens to the laboratory usually results in greater likelihood of recovering pathogens. In normal working hours, this is achieved by prompt transportation to the laboratory by the van collection (for those off the hospital site), or by the PTS or portering staff (for those on the hospital site).

NB: Do not use the PTS for CSF specimens.

If transport delay to the laboratory is expected, refrigeration is preferable to storage at ambient temperature.

Sample retention times

The following sample retention times are given to indicate the time limits for requesting additional examinations on specimens. Samples are retained primarily for traceability purposes after 24 hours. Viability of specimens after this time cannot be guaranteed and where possible, repeat specimens are preferred.

Sample	Retention time
Cerebrospinal fluid	3 months
Tissues and biopsies	3 months
Joint fluid	3 months
Mycology samples	1 month
Other microbiology samples	1 week
Culture plates	1 week
Respiratory PCR samples	1 week
Serology samples	See serology section

Where additional tests are required, these should be made by submitting an add-on request by sending an ICE form to Specimen Reception. Where this is not possible the department should be contacted to discuss further.

Specimens not processed by the Microbiology Laboratory

The laboratory does not perform the microbiological examination of foods, milk or water, other than *Pseudomonas* testing of hospital water outlets in augmented care units. It does not process environmental samples without discussion with a Consultant Microbiologist in advance.

The laboratory does not perform the forensic examination of any specimens.

Antibiotic susceptibility tests

Antibiotic susceptibility tests are performed routinely when organisms of possible clinical significance are isolated. The range of antimicrobials tested and reported is limited to those likely to be of clinical value and, for hospital

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practice, those normally stocked in Pharmacy. The request form should state which antibiotic the patient is receiving (or intended); the susceptibility to that agent will usually be included in the report. If clinicians wish to know the susceptibility to new or unusual agents please request this on the form and we will usually be able to help. Such tests may be performed in selected cases by special request to the Consultant Microbiologist.

Antibiotic assays: Teicoplanin, vancomycin and gentamicin

3 -10 mL of clotted blood is required. Teicoplanin levels are sent away for testing and vancomycin and gentamicin levels are processed by Blood Sciences. Detailed prescribing guidelines, timing of assays and reference ranges for aminoglycosides and glycopeptides are available on Eolas.

Antibiotic assays: Amikacin, isoniazid, itraconazole and rifabutin

For amikacin, itraconazole and rifabutin, 3-10 mL of clotted blood is required. For isoniazid, 1-2 mL of whole blood in fluoride oxalate tube is required. Levels are sent away for testing.

Request for examination of specimens from nursing and residential homes in the community

Specimens are **only accepted under the authority of a doctor**, whose name must be stated on the form. This will usually be the patient's GP, occasionally a designated Medical Officer or, in community-based outbreaks, sometimes the Consultant for Communicable Disease Control or the Chief Environmental Health Officer acting on his behalf. Reports on the specimen will be returned to that doctor. Request forms **must show full details** of the patient, age, location, date, clinical information including indication for test, specimen type, test required and details of any current antibiotic treatment.

Request for investigation of specimens for *Mycobacterium* spp.

Specimens should be collected before the start of antimicrobial therapy where possible.

For sputum specimens the material required is expectorated from the lower respiratory tract by deep coughing. Physiotherapy may be required for some patients. For sputum samples ideally a minimum of 5.0 mL is required.

Saliva and postnasal secretions are not suitable.

Bronchoalveolar lavage (BAL), pleural fluids and associated specimens need specialist collection according to local clinical protocols.

Urine samples should be early morning specimens (EMU) and should be taken on 3 consecutive days into a plain bottle. Boric acid bottles are not acceptable.

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For other specimens a 30 mL sterile universal container should be filled to the 30 mL line.

Specimens should be transported and processed as soon as possible.

If processing delay is unavoidable, refrigeration is preferable to storage at ambient temperature. Delays over 48 hours are not acceptable.

SEROLOGY/VIROLOGY

Most requests require a single 3 – 10 mL sample of clotted blood. Detection of a ≥ 4 fold rise or fall in titre of specific antibody indicates current or recent infection. Detection of specific IgM antibody in the serum is also indicative of acute infection in many conditions.

The containers, turnaround times, specimen retention times and laboratories where serological tests are performed are shown in the table starting on page 83.

Human immunodeficiency virus (HIV) serology

A 3-10mL sample of clotted blood is required. The laboratory uses a HIV Ag/Ab combination assay for simultaneous qualitative detection of antibodies to HIV type 1 and/or type 2, and HIV p24 antigen. Blood should be sent for diagnostic HIV tests only after the patient has undergone counselling for the test. The reference laboratory at Leeds SJUH will perform any further confirmatory testing for HIV as appropriate e.g. HIV viral load.

Sexual Health Clinic

They specifically wish to have their samples sent to Micropathology for HCV viral loads and genotyping, HIV viral loads and resistance markers.

Ante-natal serology

A 5-10 mL of clotted blood is typically required to allow for confirmatory testing and other diagnostic tests where necessary. HIV, syphilis antibodies and hepatitis B surface antigen should be requested, with appropriate pre-test counselling. Positive results for HIV, syphilis or hepatitis B and negative results will be communicated to the antenatal screening coordinator by the laboratory.

Turnaround times are in accordance with standards set by the UK National Screening Committee. Initial screening tests are performed in Harrogate. Positive results require confirmatory testing by the reference laboratory. The time for reporting screen positive specimens may be up to 8 working days to take into account of the time taken to transport the specimen and receive the referral laboratory report.

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Blood for polymerase chain reaction (PCR) testing

The majority of PCR tests require 2- 4mL in EDTA-containing tubes. PCR has been developed to an increasing range of viruses to detect and measure the amount of viral nucleic acid in clinical specimens. Quantitative versions of these tests are called viral loads and may be used to assess a person's infection status and to monitor treatment. The commonly requested PCR tests are given in the table starting on page 81.

Quantiferon TB-Gold testing

Specimens for Quantiferon testing must be received in the laboratory between 09:00 – 16:00, Monday – Wednesday. Samples received outside of these hours will not be tested.

Specimens must be received in specific tubes (Quantiferon tube packs are available from the Microbiology department). Each of the 4 tubes must be filled with exactly 1ml of blood.

Swabs and vesicle fluid for virology

Vesicle fluid from rashes may be sent for viral PCR after discussion with the laboratory. On safety grounds, syringes and needles are no longer acceptable for submission to the laboratory. A viral swab should be used to collect fluid and material from the base of a lesion and submitted promptly in viral transport medium. Viral transport media is available from Stores during routine working hours.

Faeces for virology

A walnut-sized sample should be sent in a faeces pot with spoon as soon as possible in the course of the illness; no transport medium is required. Please provide details of the illness and date and time of onset on the request form. Children under 5 years are routinely screened for rotavirus and adenovirus. Testing for norovirus is only performed during outbreaks.

INFECTION PREVENTION & CONTROL

IPC contact details are available through the HDFT website and policies are available on PolicyStat.

Out-of-hours IPC advice is provided through switchboard by the IPCNs at weekends and bank holidays 10.00-16.00 and at all other times by the Consultant Microbiologist on-call.

Inoculation ('needlestick') and other sharp injuries

The procedure for urgent assessment and management of inoculation ('needlestick' and other body fluid) exposures is set out in Occupational Health and Wellbeing Management of Body Fluid Exposure (BFE), available on PolicyStat.

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A 10 mL sample of blood should always be sought from the recipient (according to the indications in the policy) and may be tested in the laboratory as a matter of urgency (such as for anti-HBs levels) and/or stored for a period of at least two years for reference purposes. In situations where the patient concerned is identifiable, he/she should be asked to provide a sample of blood (with appropriate pre-test counselling) to be tested for hepatitis B, C and HIV for the benefit of the recipient of the exposure.

Notification of infectious diseases

Forms for the notification of infectious diseases are available at <https://www.gov.uk/government/publications/notifiable-diseases-form-for-registered-medical-practitioners>

A list of notifiable diseases is shown in *Hospital Control of Infection Policy 2: Isolation of Patients Policy Principles and Notification of Infectious Diseases*.

It is the duty of the clinical doctor first diagnosing the case to notify the Health Protection Team (HPT) on 0113 386 0300. The written forms are always required but in urgent/serious cases, particularly where an outbreak is suspected or prophylactic drugs or vaccines are indicated for the protection of contacts (i.e. diseases such as dysentery, food poisoning, typhoid fever, meningitis) a phone call should also be made to the CCDC so that he/she can begin investigations without delay.

Out-of-hours cover for HPT is available by the telephoning 0151 9091219.

Reference Laboratories

Please request information from the Pathology laboratory regarding referral laboratories.

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Table 1 Specimens for Bacteriology, Parasitology or Mycology Investigations

Specimen Type	Sample collection	Service location Turnaround time – All TAT are approximate unless more complex work is required on a sample or isolate. Where further referral of specimens/isolates is required, TATs may be increased
Blood culture	Standard blood culture set: 1 x BD BACTEC PLUS Aerobic /F culture vial (blue/grey lid) 1 x BD BACTEC Lytic/10 Anaerobic /F culture vial (purple lid) Each bottle requires 8.0 -10.0 mL blood NHS England recommends the collection of 2 sets of blood culture bottles (2 aerobic and 2 anaerobic bottles) from adult patients with suspected sepsis. Blood culture bottles themselves - containing blood taken from PICC line, peripheral line, central venous line etc. - must be clearly labelled as such, not just the request forms. Or for children, Paediatric bottle: 1 BD BACTEC PEDS PLUS/F culture vial (pink lid) Requires 1.0 -3.0 mL blood Protocols for the aseptic collection of blood cultures are available on PolicyStat at: Procedure 031 Principles of Asepsis. Standard operating procedures (SOP) for taking blood culture samples at HDFT in Acute and Community settings	In-house test Interim negative reports are issued after 36 hours for paediatric patients, and 48 hours for all other patients. Negative reports issued after 5 days. However when infective endocarditis is suspected, or where clinical details indicate animal bite, bottles are incubated for 10 days The Consultant Microbiologist will contact clinical staff with positive results. Significant isolates from blood cultures are stored at -80°C for 2 years.

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Specimen Type	Sample collection	Service location Turnaround time – All TAT are approximate unless more complex work is required on a sample or isolate. Where further referral of specimens/isolates is required, TATs may be increased
Bile (culture)	Container: 30 mL white top universal Routine examination is culture for bacteria only. By specific request: screening for <i>Salmonella</i> carriage/infection may be performed	In-house test TAT 3 working days
Broncho-alveolar lavage fluid (culture)	Container: 30 mL white top universal Routine examination is culture for bacteria and fungi	HCA Healthcare UK TAT up to 10 working days
Broncho-alveolar lavage fluid (additional tests)	By specific request only: mycobacterial culture, Legionella culture, pneumocystis, viral PCR	LEEDS SJUH (pneumocystis, virology) TAT 10 working days (referred by HCA Healthcare UK) HCA Healthcare (mycobacterial culture) TAT up to 8 weeks
<i>Candidozyma auris</i> (C. auris) screening swabs	Container: Amies transport medium with charcoal (Transwabs) Performed by culture method using chromogenic agar. Guidance on <i>C. auris</i> screening is available on PolicyStat – Section 045: Procedure for <i>Candidozyma auris</i> (C. auris)	In-house tests TAT 5 days
Central venous catheter tips (culture)	Container: 30 mL white top universal Disinfect skin site and remove catheter using aseptic technique. Cut 4cm length of catheter, including tip, using sterile scissors. Only send catheter tip when infection is suspected (not routinely)	In-house test TAT 3 working days

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Specimen Type	Sample collection	Service location Turnaround time – All TAT are approximate unless more complex work is required on a sample or isolate. Where further referral of specimens/isolates is required, TATs may be increased
Cerebrospinal Fluid (cell count, Gram stain and bacterial culture)	Container: 3 x 30 mL white top universal & fluoride oxalate tube Collect 4 sequential CSF samples into numbered containers Specimen 1: 0.5 mL CSF grey fluoride oxalate tube Specimen 2: 0.5 mL CSF into universal container for protein Specimen 3: 1.0 mL CSF into sterile universal for Microbiology Specimen 4: 1.0 mL CSF into universal for spectrophotometry Specimen no 3 is usually sent to microbiology, the rest are for biochemical tests DO NOT send in the pneumatic tube system-send the specimens via a porter and contact both Microbiology and Biochemistry (or on-call BMS if out of hours up until 8:30pm) before sending the specimen to ensure urgent processing. After 8:30pm on weekdays and weekends the Microbiology CSF sample should be sent to Airedale Microbiology by taxi using Airedale Microbiology request on ICE and sample transport boxes provided.	In-house tests Telephone call made to alert requester that interim report is available on ICE within 1 hour of receipt TAT 3 days
Cerebrospinal fluid (additional tests)	Requests for viral PCR, meningococcal and pneumococcal PCR and mycobacterial culture all require discussion with the Consultant Microbiologist	Viral PCR: Leeds SJUH* TAT 7 days Meningococcal and pneumococcal PCR: Leeds SJUH* TAT 7 days Mycobacterial culture: AGH TAT up to 8 weeks

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Specimen Type	Sample collection	Service location Turnaround time – All TAT are approximate unless more complex work is required on a sample or isolate. Where further referral of specimens/isolates is required, TATs may be increased
Chlamydia /GC RNA (endocervical/urethral)	Container: GenProbe APTIMA unisex swab specimen collection kit for endocervical or male urethral specimens (purple box & collection kit labelling)	AGH TAT Chlamydia 7days GC 10 Days
Chlamydia/GC RNA (vaginal)	Container: GenProbe APTIMA vaginal swab specimen collection kit for self-taken or clinician collected specimens (orange box & collection kit labelling)	AGH TAT Chlamydia 7days GC 10 Days
Chlamydia/GC RNA (urine)	Container: GenProbe APTIMA urine specimen collection kit (yellow box & collection kit labelling)	AGH TAT Chlamydia 7days GC 10 Days
Chlamydia/GC RNA (other sites)	Container: GenProbe APTIMA collection kit using unisex or vaginal swab Eye swabs, pharyngeal and rectal swabs are also accepted for chlamydia testing although please note that this technique has not been validated for these specimens and the requesting clinician carries responsibility for acting on the results Note: eye swabs should NOT be taken following the use of fluorescein as this may be inhibitory.	AGH TAT Chlamydia 7days GC 10 Days
Corneal Scrape (microscopy and culture)	Packs consisting of BHI broth, glass slide and a charcoal swab are available in the Ophthalmology department (ordered from Microbiology). Only clinicians trained in the taking and plating of corneal scrapes should perform this test.	In-house test TAT 4 working days (initial culture result) 10 days (Actinomyces culture)
CPE testing	See rectal swab below	

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Specimen Type	Sample collection	Service location Turnaround time – All TAT are approximate unless more complex work is required on a sample or isolate. Where further referral of specimens/isolates is required, TATs may be increased
Ear swabs, associated samples (e.g. pus from ear)	Container: Amies transport media with charcoal (Transwabs). Pus to be collected into sterile universal container.	In-house tests TAT 3 working days
Eye swabs, aqueous and vitreous humour, canaliculal pus (culture)	Microscopy is performed on eye swabs from neonates and canaliculal pus. Container: swabs to be collected in Amies transport media with charcoal. Intraocular fluids to be collected by an ophthalmic surgeon into sterile universal container. Pus to be collected into sterile universal container. Actinomyces culture is performed in addition to routine culture where clinical details are indicative. Viral PCR: swab in viral transport medium	In house tests TAT 4 working days 10 days (where Actinomyces culture is performed) Viral PCR: Leeds SJUH* TAT 7 days
Faecal calprotectin	Container: blue or brown topped universal with integral spoon. For patient information regarding stool collection methods see Appendix 4	In-house tests TAT 7 working days
Faeces (culture)	Container: 30 mL blue top universal with integral spoon (use 2-3 scoops) For patient information regarding stool collection methods see Appendix 1 Please provide information regarding any recent foreign travel. Ova, cysts and parasites investigation by specific request only. Where food poisoning is suspected, please indicate the probable food source.	In-house tests TAT 4 days

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Specimen Type	Sample collection	Service location Turnaround time – All TAT are approximate unless more complex work is required on a sample or isolate. Where further referral of specimens/isolates is required, TATs may be increased
Faeces (virology)	Container: 30mL blue top universal with integral spoon Rotavirus and adenovirus investigation on all patients under 5yrs. Extended viral gastroenteritis screen by specific request only (investigation of outbreaks only, Ilog number must be provided with request)	Rotavirus and Adenovirus: in house tests TAT 4 days Extended viral gastroenteritis screen: Leeds SJUH* TAT 7 days
Faeces for <i>Clostridioides difficile</i>	<i>Clostridioides difficile</i> toxin test is performed on all inpatients ≥2y with loose stools, (or clinical details stating type 5,6 or 7 stool) for all outpatients/GP/ED/OccHealth patients ≥65y with diarrhoea samples (unless specifically requested on patients 2-65y) Only diarrhoeal specimens, which take the shape of the specimen container, are tested. A minimum of 1.5 mL of sample is required.	In-house tests TAT Same day testing when specimen received before 15:00 weekdays and 11:00 weekends
Faeces for <i>Helicobacter pylori</i>	Container: sterile universal or 30 mL blue top universal with integral spoon (1 scoop is sufficient) ICE requesting via microbiology, faeces	In-house tests TAT 7 working days See serology table below for interfering substances and TAT

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Specimen Type	Sample collection	Service location Turnaround time – All TAT are approximate unless more complex work is required on a sample or isolate. Where further referral of specimens/isolates is required, TATs may be increased
Fluid from normally sterile sites (microscopy and culture, including enrichment broth culture)	Container: 30 mL white top universal Contact the laboratory on ext 5645 (or on-call BMS via switchboard if out-of-hours up until 8:30pm) before sending the specimen to ensure urgent processing. After 8:30pm on weekdays and weekends the samples should be sent to AGH by taxi using AGH request on ICE and sample transport boxes provided.	In-house tests (except for pleural fluid, referred to HCA Healthcare UK) Interim microscopy report (urgent, out-of-hours Gram stain, cells and crystals if appropriate) issued within 2 hrs and the report is available on ICE. Up to 3 working days for pleural fluids. TAT 4 days (up to 7 days for pleural fluid) Mycobacterial culture: AGH TAT up to 8 weeks

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Specimen Type	Sample collection	Service location Turnaround time – All TAT are approximate unless more complex work is required on a sample or isolate. Where further referral of specimens/isolates is required, TATs may be increased
Fungal microscopy and culture	Container: Dermapak or 30 mL white top universal For hair, skin scrapings, nail clippings: Numbers and frequency of specimen collection are dependent on clinical condition of patient. The minimum amount that is acceptable should be enough to cover a five pence piece. Use aseptic technique: Skin - swab with 70% alcohol prior to collection. Edges of skin lesions yield greatest quantities of viable fungus. Scrape with a blunt scalpel blade. If insufficient material can be obtained by scraping - press a swab or sticky tape onto lesion, transfer to a clean glass slide for transportation Nail – sample discoloured, dystrophic or brittle parts of the nail. The affected nail should be cut as far back as possible through the entire thickness and should include any crumbly material. If associated skin lesions are present samples from these are likely to be infected with the same organism and are more likely to give a positive culture. Sample from associated sites should be sent in separate packets. Hair -Samples from the scalp should include skin scales and hair stumps. Cut hairs are not suitable for direct examination. Plastic hairbrushes, scalp massage pads, swabs or plastic toothbrushes may be used to sample scalps for culture where there is little obvious scaling. Any sharps used during the collection of these samples must be disposed of safely.	In-house tests Interim microscopy after 3 working days TAT 3 weeks

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Specimen Type	Sample collection	Service location Turnaround time – All TAT are approximate unless more complex work is required on a sample or isolate. Where further referral of specimens/isolates is required, TATs may be increased
Genital swabs (culture)	Container: Amies transport medium with charcoal (Transwabs) Take cervical and high vaginal swabs with the aid of a speculum to avoid vulval contamination. For trichomonas swab the posterior fornix. If pelvic infection or gonorrhoea is suspected include the cervical os. Microscopy for bacterial vaginosis is performed on HVS samples from all pregnant patients, and on specific request on patients aged 14-60 only.	In-house tests TAT 3 working days
Gastric biopsy (<i>H.pylori</i> isolation)	Container: 30ml sterile white topped universal. Biopsy to be sent in sterile saline Specimens must be received before 12pm on Thursday to guarantee full testing by the referral laboratory	<i>H.pylori</i> isolation: GBRU Colindale
Water (for hospital tap water testing only)	Container: Sterilin Sterile Water Sampling Bottle containing sodium thiosulphate Specimens collected by HIF personnel on pre-arranged weekday and delivered straight to Microbiology department.	In-house tests TAT 3 working days
Mouth swabs, oral rinse	Container: Amies transport medium with charcoal (Transwabs) Oral rinse sterile to be collected into universal container	In-house tests TAT 3 working days
MRSA screening swabs	Container: Amies transport medium with charcoal (Transwabs) Routine screening of elective and emergency admissions are performed by culture method using chromogenic agar. Guidance on MRSA screening is in the Hospital Infection Prevention & Control Procedure 012 for Meticillin-Resistant Staphylococcus Aureus (MRSA)	In-house tests TAT 3 days

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Specimen Type	Sample collection	Service location Turnaround time – All TAT are approximate unless more complex work is required on a sample or isolate. Where further referral of specimens/isolates is required, TATs may be increased
Nasal swabs, antral washout, sinus aspirate, sinus washout (culture)	Container: Amies transport medium with charcoal (Transwabs) Aspirates/washouts to be collected into sterile universal container (ideally minimum volume of 1ml)	In-house tests TAT 2 working days (nasal swabs) TAT 3 working days (aspirates/washouts)
Pernasal swab for diagnosis of pertussis (whooping cough)	Container: pernasal swab (note: thin wire shaft) Pernasal swabs for pertussis culture and full instructions for their use are available from the microbiology department. The swabs have a thin flexible wire shaft. SWABS WITH A RIGID SHAFT ARE UNSUITABLE AND WILL NOT BE PROCESSED. After sampling, swabs should be transported to the laboratory in CHARCOAL TRANSPORT MEDIUM (this is the black medium supplied with 'standard' microbiology swabs).	Culture: In-house tests TAT 7 days Serology/PCR (see table 2)
Rectal swab for CPE testing	Samples should be collected using a 'Copan' dual swab (supplied with instructions to all wards)	In-house test TAT 12 hours Same day testing when specimen received before 16:30 weekdays and 11:00 weekends
Respiratory specimens: sputum, tracheal secretions, tracheal aspirate	Container for sputum: 60mL wide topped universal container	HCA Healthcare UK TAT up to 7 working days Mycobacterial culture: AGH TAT up to 8 weeks

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Specimen Type	Sample collection	Service location Turnaround time – All TAT are approximate unless more complex work is required on a sample or isolate. Where further referral of specimens/isolates is required, TATs may be increased
Respiratory samples for molecular detection of SARS-CoV-2 or respiratory viruses	Viral transport media for nose/throat swabs	TAT within 24 hours
Schistosomiasis (Bilharzia)	Container: 3x 250mL universal Collect the total volume of urine produced between 1000-1400 hours	In-house tests TAT 3 working days
Threadworm (<i>Enterobius vermicularis</i>)	A perianal swab is used in preference to a sellotape slide. Both samples should be taken in the morning before washing the perianal area. Faeces are not an appropriate specimen. Use cotton wool swab in dry container. Spread buttocks apart, rub moistened cotton wool swab over area around anus. Place swab back in container (no transport medium required). OR Apply sellotape to perianal region, pressing adhesive side of tape firmly against left and right perianal folds several times. Smooth the tape back on a slide, adhesive side down.	In-house tests TAT 2 working days
Throat swabs	Container: Amies transport medium with charcoal (Transwabs)	In-house tests TAT 3 working days

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Tissue/ biopsies (culture)	Container: 30 mL white top universal A small amount of sterile normal saline may be added to prevent desiccation. Contact the laboratory (or on-call BMS if out-of-hours) before sending the specimen to ensure urgent processing	Orthopaedic Implant associated tissues: In-house tests Non-orthopaedic tissues: HCA Healthcare UK TAT up to 25 days –due to extended incubation times for potentially slow growing organisms
Urine cell count and culture	Container: boric acid universal (30 mL red top) Standard procedures for midstream urine collection are used For dipstick testing, please decant a small amount of urine into a second container to prevent contamination of the sample. Fill container to the line as indicated on the label. If <1mL urine is collected, a 30mL white top universal container (without boric acid) should be used. CSU from indwelling catheters is obtained from the sample port in the catheter tubing and NOT from the bag	In-house tests If white cell count <80/uL and no bacteriuria detected, final report released within 90 minutes If white cell count >80/uL and/or bacteriuria is detected TAT 48-72 hrs
Urinary legionella and pneumococcal antigen detection	Container: 30 mL white top universal ICE requesting via microbiology, urine	In-house tests TAT 2 days
Urine CMV PCR	Container: 30 mL white top universal	Leeds SJUH TAT 5 days

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Specimen Type	Sample collection	Service location Turnaround time – All TAT are approximate unless more complex work is required on a sample or isolate. Where further referral of specimens/isolates is required, TATs may be increased
Wound swabs, skin swabs, swab of pus	Amies transport medium with charcoal (Transwabs) Samples of pus are preferred to swabs	In-house tests TAT 3 working days (TAT 4 working days for swab of pus)
Wound- pus/exudate	Sterile universal container Ideally minimum volume of 1ml Samples of pus are preferred to swabs Please indicate whether actinomycosis or other slow growing pathogens are suspected to ensure that the culture receives prolonged incubation	In-house tests TAT 4 working days (TAT 10 days for actinomycosis)

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Table 2 Specimens for Serology/Virology (note that for referral tests, turnaround times are working days)

Test required	Container 1 x	Maximum turnaround time (days) Note- where further confirmation is required, TATs may be increased	Specimen retention time	Investigation performed at	Factors significantly affecting performance or result interpretation
Acanthamoeba PCR	Corneal scrape, eye swab, contact lens fluid	7	N/A	Micropathology	Advice provided by reference laboratory on final report where applicable
Adenovirus PCR	Purple	5	N/A	Leeds SJUH*	Advice provided by reference laboratory on final report where applicable
Amikacin levels	Gold	7	N/A	Severn Pathology, Bristol	Advice provided by reference laboratory on final report where applicable
Amoebic antibodies	Gold	14	N/A	HTD*	Advice provided by reference laboratory on final report where applicable
Antistreptolysin O titre (ASOT)	Gold `	9	N/A	Severn Pathology, Bristol	Advice provided by reference laboratory on final report where applicable ASOT: >200 IU/mL may be indicative of streptococcal infection
Aspergillus gallactomannan	Gold	7 (10 for BAL specimens)	N/A	Leeds SJUH*	Advice provided by reference laboratory on final report where applicable
Beta-D-Glucan	Gold	7	N/A	Mycology, Leeds SJUH	Advice provided by reference laboratory on final report where applicable
BK virus PCR	Purple	10	N/A	Leeds SJUH	Advice provided by reference laboratory on final report where applicable

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Test required	Container 1 x	Maximum turnaround time (days) Note- where further confirmation is required, TATs may be increased	Specimen retention time	Investigation performed at	Factors significantly affecting performance or result interpretation
<i>Bordetella pertussis</i> antibodies	Gold	10	N/A	RVP, Colindale	Advice provided by reference laboratory on final report where applicable
Borrelia antibodies	Gold	5	4 wks	In-house	This assay has not been established with heat-inactivated, haemolysed, lipaemic or icteric samples.
Borrelia antibodies confirmation	Gold	10	N/A	RIPL Porton Down	Advice provided by reference laboratory on final report where applicable
Brucella antibodies	Gold	14	N/A	BRU	Advice provided by reference laboratory on final report where applicable
Chikungunya serology	Gold	10	N/A	RIPL (Porton Down)	Advice provided by reference laboratory on final report where applicable
Cytomegalovirus (CMV) PCR	Purple	5	N/A	Leeds SJUH	Advice provided by reference laboratory on final report where applicable
CMV antibodies	Gold	10	N/A	IgM / IgG Leeds SJUH	Advice provided by reference laboratory on final report where applicable
CMV avidity	Gold	10	N/A	Leeds SJUH	Advice provided by reference laboratory on final report where applicable
Coxiella serology	Gold	14	N/A	RIPL, Porton Down	Advice provided by reference laboratory on final report where applicable
Cryptococcus antigen	Gold	7	N/A	Leeds SJUH	Advice provided by reference laboratory on final report where applicable
Cysticercosis	See Taenia antibodies				Advice provided by reference laboratory on final report where applicable
Dengue virus serology	Gold	10	N/A	RIPL, Porton Down	Advice provided by reference laboratory on final report where applicable

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Test required	Container 1 x	Maximum turnaround time (days) Note- where further confirmation is required, TATs may be increased	Specimen retention time	Investigation performed at	Factors significantly affecting performance or result interpretation
Diphtheria antibodies	Gold	21	N/A	COL	Advice provided by reference laboratory on final report where applicable
Echinococcus antibodies	Gold	28	N/A	HTD	Advice provided by reference laboratory on final report where applicable
Epstein Barr Virus (EBV) PCR	Purple	7	N/A	Leeds SJUH	Advice provided by reference laboratory on final report where applicable
EBV antibodies	Gold	10	N/A	IgM / IgG Leeds SJUH	Advice provided by reference laboratory on final report where applicable
Farmers lung antibodies	Gold	10	N/A	Leeds SJUH	Advice provided by reference laboratory on final report where applicable
Filarial antibodies	Gold	14	N/A	STM	Advice provided by reference laboratory on final report where applicable
Hepatitis A antibodies (IgM)	Gold	5	6 mths	In-house	This assay has not been established with cord blood, neonatal, cadaver or heat-inactivated samples or body fluids other than serum or plasma. Samples that are haemolysed, lipaemic, icteric or proteinaemic from patient that are immunosuppressed or immunocompromised may affect result.
Hepatitis A antibodies (total - immune status)	Gold	10	N/A	Leeds SJUH	Advice provided by reference laboratory on final report where applicable

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Test required	Container 1 x	Maximum turnaround time (days) Note- where further confirmation is required, TATs may be increased	Specimen retention time	Investigation performed at	Factors significantly affecting performance or result interpretation
Hepatitis B core antibodies	Gold	10	N/A	In-house Confirmation at Leeds SJUH	Advice provided by reference laboratory on final report where applicable
Hepatitis B markers	Gold	10	N/A	Leeds SJUH	Advice provided by reference laboratory on final report where applicable
Hepatitis B PCR	Purple	10 (Leeds SJUH) 7 (Micro pathology)	N/A	Leeds SJUH Micropathology (STC patients only)	Advice provided by reference laboratory on final report where applicable
Hepatitis B surface antibodies (anti-HBs - immune status)	Gold	5	4 wks	In-house	This assay has not been established with cord blood, neonatal, cadaver or heat-inactivated samples or body fluids other than serum or plasma. Samples that are haemolysed, lipaemic, icteric or proteinaemic, biotin spiked or hyper IgG from patient that are immunosuppressed or immunocompromised may affect result. For interpretation of Anti-HBs levels in certain patient groups, please refer to Hepatitis B; the green book (2022).

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Test required	Container 1 x	Maximum turnaround time (days) Note- where further confirmation is required, TATs may be increased	Specimen retention time	Investigation performed at	Factors significantly affecting performance or result interpretation
Hepatitis B surface antigen	Gold	5	6 mths 2yrs antenatal	In-house Confirmation at Leeds SJUH	This assay has not been established with cord blood, neonatal, cadaver or heat-inactivated samples or body fluids other than serum or plasma. Samples that are haemolysed, lipaemic, icteric or proteinaemic, biotin spiked, hyper IgG or high in cholesterol from patient that are immunosuppressed or immunocompromised may affect result.
Hepatitis C antibodies	Gold	5	6 mths 2yrs antenatal	In-house	This assay has not been established with cord blood, neonatal, cadaver or heat-inactivated samples or body fluids other than serum or plasma. Samples that are haemolysed, lipaemic, icteric or proteinaemic or from patient that are immunosuppressed or immunocompromised may affect result.
Hepatitis C antibodies (confirmation)	Gold	10	N/A	Leeds SJUH	Advice provided by reference laboratory on final report where applicable
Hepatitis C PCR	Purple	10 (21 for genotyping) Leeds SJUH 7 (Micro pathology)	N/A	Leeds SJUH Micropathology (STC patients only)	Advice provided by reference laboratory on final report where applicable
Hepatitis D antibodies	Gold	14	N/A	Leeds SJUH	Advice provided by reference laboratory on final report where applicable

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Test required	Container 1 x	Maximum turnaround time (days) Note- where further confirmation is required, TATs may be increased	Specimen retention time	Investigation performed at	Factors significantly affecting performance or result interpretation
Hepatitis E antibodies	Gold	10	N/A	Leeds SJUH	Advice provided by reference laboratory on final report where applicable
Herpes simplex virus (HSV) antibodies	Gold	10	N/A	Leeds SJUH	Advice provided by reference laboratory on final report where applicable
HSV PCR	CSF/ Eye swab/throat swab/skin swab/ in viral transport genital swab orange APTIMA STM	7	N/A	Leeds SJUH	Advice provided by reference laboratory on final report where applicable
HIV antibody/antigen	Gold	5	6 mths 2yr antenatal	In-house	This assay has not been established with cord blood, neonatal, cadaver or heat-inactivated samples or body fluids other than serum or plasma. Samples that are haemolysed, lipaemic, icteric or proteinaemic, hyper IgG, cholesterol, hyperproteinaemic, biotin spiked or from patient that are immunosuppressed or immunocompromised may affect result. This assay has not been established for infants or children.

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HIV genotype/viral load	Purple	10 (Leeds SJUH) 7 (Micro Pathology)	N/A	Leeds SJUH Micropathology (STC only)	Advice provided by reference laboratory on final report where applicable
HIV confirmation	Gold	10	N/A	Leeds SJUH*	Advice provided by reference laboratory on final report where applicable
HTLV I/II	Gold	10	N/A	Leeds SJUH*	Advice provided by reference laboratory on final report where applicable
Hydatid cyst	See Echinococcus antibodies				Advice provided by reference laboratory on final report where applicable
Itraconazole levels	Gold	10	N/A	Severn Pathology, Bristol	Advice provided by reference laboratory on final report where applicable
Isoniazid levels	Grey	10	N/A	Severn Pathology, Bristol	Advice provided by reference laboratory on final report where applicable
JC virus PCR	CSF	7	N/A	Leeds SJUH*	Advice provided by reference laboratory on final report where applicable
Legionella antigen	Urine (boric acid or white topped universal)	2	1 wk	In-house	This assay has not been established in out-patients
Leishmania antibodies	Gold	14	N/A	STM	Advice provided by reference laboratory on final report where applicable
Leptospira antibodies	Gold	10	N/A	RIPL, Porton Down	Advice provided by reference laboratory on final report where applicable
Lyme disease	See Borrelia antibodies				

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Test required	Container 1 x	Maximum turnaround time (days) Note- where further confirmation is required, TATs may be increased	Specimen retention time	Investigation performed at	Factors significantly affecting performance or result interpretation
Measles antibodies	Gold	5 – 10	4 wks	In house – IgG Leeds SJUH - IgM	IgG: This assay has not been established with plasma, heat-inactivated, haemolysed, lipaemic or icteric samples. IgM: Advice provided by reference laboratory on final report where applicable
Measles PCR	Buccal swab in viral transport with red or pink top	6	N/A	Leeds SJUH	Advice provided by reference laboratory on final report where applicable
Meningococcal antibodies	Gold	14	N/A	MRI*	Advice provided by reference laboratory on final report where applicable
Meningococcal and Pneumococcal PCR	Purple	7	N/A	Leeds SJUH	Advice provided by reference laboratory on final report where applicable
Mpox (MPXV) PCR	Swab of vesicle/ulcer in viral transport	Only available on specific request with referral laboratory	N/A	RIPL, Porton Down	Advice provided by reference laboratory on final report where applicable
Mumps antibodies	Gold	10	N/A	Leeds SJUH*	Advice provided by reference laboratory on final report where applicable
Mumps PCR	Throat swab in viral transport, oral fluid, NPA, urine or CSF	14	N/A	VRD Colindale (UKHSA)	Advice provided by reference laboratory on final report where applicable
Needle stick injury	Gold	3	2 yrs	In-house	See specific sections on HIV antigen/antibody, Hep C antibodies, Hep B surface antigen
Parvovirus antibodies	Gold	10	N/A	Leeds SJUH	Advice provided by reference laboratory on final report where applicable

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Test required	Container 1 x	Maximum turnaround time (days) Note- where further confirmation is required, TATs may be increased	Specimen retention time	Investigation performed at	Factors significantly affecting performance or result interpretation
Parvovirus PCR	Purple	7	N/A	Leeds SJUH	Advice provided by reference laboratory on final report where applicable
Pertussis	See <i>Bordetella pertussis</i>				
Polio antibodies	Gold	Contact referral lab	N/A	COL	Advice provided by reference laboratory on final report where applicable
Pneumococcal antigen	Urine (boric acid or white topped universal)	2	1 wk	In-house	This assay has not been established in young children. This assay has not be established for patients who have taken antibiotics for > 24 hours. Patients who have received pneumococcal vaccine within the last five day may have false positive result.
QuantiFERON-TB	4x blood tubes- yellow, green, grey and purple (Quantiferon tube pack available from Microbiology)	7	4 weeks	In-house	Specimens must be received between 09:00 and 16:00 Monday - Wednesday

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Test required	Container 1 x	Maximum turnaround time (days) Note- where further confirmation is required, TATs may be increased	Specimen retention time	Investigation performed at	Factors significantly affecting performance or result interpretation
In patients : In house Respiratory PCR screen to include RSV, influenza A & B and SARS CoV-2	Nose / Throat swab in viral transport	1	1 day	In house	Testing performed between 09:00 and 21:00 - 7 days a week
In patients (extended panel) Respiratory PCR screen to include RSV, influenza A & B, parainfluenza, adenovirus, coronavirus including SARS and MERS, metapneumovirus, rhinovirus/enterovirus, <i>B. pertussis</i> , <i>B.</i> <i>parapertussis</i> , <i>C.</i> <i>pneumoniae</i> , <i>M.</i> <i>pneumoniae</i>	Nose / Throat swab in viral transport	1	7 days	In house	Testing performed between 09:00 and 21:00 - 7 days a week Test requesting restricted to paediatric patients <1 yr old, other patients by specific request
Rickettsia antibodies	Gold	10	N/A	RIPL, Porton Down	Advice provided by reference laboratory on final report where applicable
Rifabutin levels	Gold	10	N/A	Severn Pathology, Bristol	Advice provided by reference laboratory on final report where applicable

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Test required	Container 1 x	Maximum turnaround time (days) Note- where further confirmation is required, TATs may be increased	Specimen retention time	Investigation performed at	Factors significantly affecting performance or result interpretation
Rubella IgG	Gold	5	2yr	In-house	This assay has not been established with cord blood, neonatal, cadaver or heat-inactivated samples or body fluids other than serum or plasma. Samples that are haemolysed, lipaemic, icteric or hyperproteinaemic or from patient that are immunosuppressed or immunocompromised may affect result.
Rubella IgM	Gold	10	N/A	Leeds SJUH	Advice provided by reference laboratory on final report where applicable
Schistosoma antibodies	Gold	14	N/A	HSL	Advice provided by reference laboratory on final report where applicable
Strongyloides antibodies	Gold	14	N/A	HSL	Advice provided by reference laboratory on final report where applicable
Syphilis antibodies	Gold	5	6 mths 2yrs antenatal	In-house	This assay has not been established with cord blood, neonatal, cadaver or heat-inactivated samples or body fluids other than serum or plasma. Samples that are haemolysed, lipaemic, icteric or proteinaemic, hyper IgG, cholesterol, hyperproteinaemic, biotin spiked or from patient that are immunosuppressed or immunocompromised may affect result.
Syphilis confirmation	Gold	10	N/A	Leeds SJUH	Advice provided by reference laboratory on final report where applicable

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Test required	Container 1 x	Maximum turnaround time (days) Note- where further confirmation is required, TATs may be increased	Specimen retention time	Investigation performed at	Factors significantly affecting performance or result interpretation
TDM for anti HIV therapy	Purple	21	N/A	Cambridge Clinical Laboratories	Advice provided by reference laboratory on final report where applicable
T Spot	Green x 2	5 days	N/A	Oxford Diagnostic Laboratories	Advice provided by reference laboratory on final report where applicable
Taenia antibodies	Gold	14	N/A	Immunology, Leeds SJUH	Advice provided by reference laboratory on final report where applicable
Teicoplanin levels	Gold	10	N/A	Severn Pathology, Bristol	Advice provided by reference laboratory on final report where applicable
Toxocara antibodies	Gold	14	N/A	HSL	Advice provided by reference laboratory on final report where applicable
Toxoplasma antibodies	Gold	5	4 wks	In-house	This assay has not been established with haemolysed, lipaemic or icteric, neonatal samples or cord blood.
Toxoplasma confirmation	Gold	14	N/A	TRL, Swansea	Advice provided by reference laboratory on final report where applicable
Toxoplasma PCR	Purple	14	N/A	TRL, Swansea	Advice provided by reference laboratory on final report where applicable
Varicella zoster virus (VZV) PCR	Purple	5	N/A	Leeds SJUH	Advice provided by reference laboratory on final report where applicable

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Test required	Container 1 x	Maximum turnaround time (days) Note- where further confirmation is required, TATs may be increased	Specimen retention time	Investigation performed at	Factors significantly affecting performance or result interpretation
VZV IgG	Gold	3	4 wks	In house	This assay has not been established with heat-activated, haemolysed, lipaemic or icteric samples.
VZV IgM	Gold	10	N/A	Leeds SJUH	Advice provided by reference laboratory on final report where applicable
Weil's disease	See Leptospira antibodies				
West Nile virus serology	Gold	10	N/A	RIPL, Porton Down	Advice provided by reference laboratory on final report where applicable
Whipples PCR	Purple	10	N/A	Leeds SJUH	Advice provided by reference laboratory on final report where applicable
Whooping cough	see <i>Bordetella pertussis</i>				
Zika virus PCR	Purple	10	N/A	RIPL, Porton Down	Advice provided by reference laboratory on final report where applicable

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Critical Alert Organisms and Infections

This section deals with the verbal communication of critical alerts initiated by the laboratory. Routine reporting to test requesters is by electronic or paper copy reporting, however, there are some results which require urgent communication – see table below. The list is not all inclusive and unusual or rare isolates or identifications can always be discussed with the Duty Consultant. In addition, the service user is directed to the interim report available on ICE for CSF, urgent joint fluid and urgent paediatric urine microscopy results.

Responsibility of staff reporting to the General Practitioners: Laboratory staff telephone GP surgeries with results for all the appropriate isolates/conditions listed in the table below. It is expected that in most cases the GP receptionist will be happy to take the results and pass them to the GP. Duty Consultants telephoning results will normally speak to the GP him/herself.

Responsibility of staff reporting to the Hospital Infection Prevention and Control Nurses: Laboratory staff telephone, message on answer phone or bleep (ext/bleep 3112) the HICN as soon as the isolate identification is made for all the appropriate organisms/conditions in the table below **unless** the Duty Consultant has advised them this is not required.

Responsibility of staff reporting to the Community Infection Prevention and Control Nurses: Laboratory staff should telephone the North Yorkshire and York IPCT for *C. difficile* cases in the community **unless** the Duty Consultant has advised them this is not required.

Telephone enquiries for results from patients and relatives: Results must not be given to patients or their relatives, or any other person not directly concerned with the care of the patient. This includes staff members at HDFT.

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Communication of key organisms and infections

<u>Organism/infection</u>	<u>CM</u>	<u>GP if not in hospital</u>	<u>HICN if in hospital</u>	<u>CICN if not in hospital</u>	<u>CCDC</u>	<u>EHO</u>
Organisms						
<i>Bacillus anthracis</i>	By BMS-U	By CM	By CM		By CM	By CCDC
<i>Bacillus cereus</i>		By BMS	By BMS		OB	
<i>Bordetella sp</i>	By BMS-P ⁱ	By CM ⁱ	By CM ⁱ			
<i>Brucella sp</i>	By BMS-U	By CM	By CM			
<i>Campylobacter sp</i>			By BMS		OB	CR
<i>Candidozyma auris</i>	By BMS - U		By BMS		By CM	
<i>Carbapenemase Producing Organism (CPO)</i>	By BMS-U	By CM	By CM	By HICN	By CM	
<i>Chlamydia trachomatis</i> ^a	By BMS-P	By CM				
<i>Clostridium botulinum</i>	By BMS-U	By CM	By CM		By CM	By CCDC
<i>Clostridioides difficile</i> ^b	By BMS-P		By CM	By HCAI email		
<i>Clostridium perfringens</i> ^c	By BMS-P					
<i>Clostridium tetani</i>	By BMS-U	By CM	By CM		By CM	
<i>Corynebacterium diphtheriae</i> or <i>ulcerans</i>	By BMS-U	By CM	By CM		By CM	
<i>Cryptosporidium</i>			By BMS		OB	CR
<i>Entamoeba histolytica</i>	By BMS-P	By CM	By CM		OB	CR
<i>E. coli</i> O157 (inc. presumptive)	By BMS-P	By CM	By CM	CR	By CM	CR
<i>Giardia</i>			By BMS		OB	CR

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<u>Organism/infection</u>	<u>CM</u>	<u>GP if not in hospital</u>	<u>HICN if in hospital</u>	<u>CICN if not in hospital</u>	<u>CCDC</u>	<u>EHO</u>
<i>Haemophilus influenzae</i> invasive disease	By BMS-P	By CM	By CM		By CM	
Hepatitis A (acute)			By BMS		By BMS	
Hepatitis B or C	By BMS/B4-P	By CM	By CM			
HIV	By BMS/B4-P	By CM	By CM			
<i>Legionella sp</i> (inc. urinary antigen)	By BMS/B4-P	By CM	By CM		By CM	
<i>Listeria sp</i>	By BMS-P	By CM	By CM		By CM	
<i>Mycobacterium</i> /AAFB	By BMS-P	By CM	By CM	CR	By CM	
<i>Neisseria gonorrhoeae</i> ^a	By BMS-P	By CM				
<i>Neisseria meningitidis</i>	By BMS-U	By CM	By CM		By CM	
Pneumococcal antigen (urinary)	By BMS/B4-R					
Respiratory Syncytial Virus (RSV)			By electronic results transmission			
Respiratory PCR at HDFT for in patients- see next table						
Respiratory PCR OPD/GP- see next table						
Rotavirus			By BMS			
<i>Salmonella sp</i>			By BMS		OB	CR
<i>Salmonella typhi/paratyphi</i>	By BMS-U	By CM	By CM		By CM	CR

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<u>Organism/infection</u>	<u>CM</u>	<u>GP if not in hospital</u>	<u>HICN if in hospital</u>	<u>CICN if not in hospital</u>	<u>CCDC</u>	<u>EHO</u>
<i>Shigella dysenteriae</i>	By BMS-P	By CM	By CM		By CM	CR
<i>Shigella sp</i>			By BMS		OB	CR
<i>Staphylococcus aureus</i> MRSA (not bacteraemia), inc PCR			By BMS	CR		
<i>Streptococcus</i> Gp A	By BMS-P ^j	By BMS ^e	By BMS		OB	
<i>Streptococcus</i> Gp B ^f		By BMS				
<i>Taenia solium</i>	By BMS-P				By CM	CR
<i>Treponema pallidum</i>	By BMS/B4-R	By CM				
<i>Vibrio sp</i>	By BMS-P	By CM	By CM		By CM	CR
<i>Yersinia enterocolitica</i>	By BMS-R		By BMS			
<i>Yersinia pestis</i>	By BMS-U	By CM	By CM		By CM	
<i>Varicella zoster IgG (if absent)</i> ^g	By BMS-P	By CM				
Other infections						
Pathogen from CSF	By BMS-U		By CM		By CM	
Bacteraemia (organisms other than organisms above)	By BMS-U	By CM	By CM ^h			

Legend

CM Consultant Microbiologist/Duty medic

BMS Biomedical Scientist

B4 Band 4 advanced practitioner

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HICN Hospital Infection Control Nurse

CCDC Consultant in Communicable Disease Control

EHO Environmental Health Officer

OB if outbreak or cluster, CM will discuss with CCDC

CR copy report

U urgent i.e. BMS informs CM if present in Department, or calls/bleeps CM if not present

P prompt i.e. BMS informs CM if present in Department, or calls/bleeps CM if not present

R routine i.e. BMS informs CM if present in Department, but waits until next routine working day if not

a non-urinary and non-genital isolates only

b use CICN 'hotline' 01423 557340

c non-gastrointestinal

d invasive disease only

e not ear/nose/throat isolates

f maternity/SCBU only. BMS also contacts requester if ANC, Community Midwife etc.

g in pregnant or immunocompromised contacts

h if an alert organism e.g. MRSA, multi-resistant GNB

I positive *Bordetella* sp culture results should be telephoned to the requesting clinical team (excluding GP OOH) by the CM

j In-patient specimens only

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Out of Hours Reporting of Respiratory PCR Results

Respiratory tract infection	Contact duty/on-call medical microbiologist	Contact IPCN
RSV	No	No
Influenza A and B	No	No
Parainfluenza	No	No
<i>Mycoplasma pneumoniae</i>	No	No
Coronavirus (non-MERS / non SARS-CoV)	No	No
SARS-CoV-1	Yes	Yes
SARS-CoV-2 (COVID-19)	No	No
MERS coronavirus	Yes	Yes
Bocavirus	No	No
Metapneumovirus	No	No
Rhinovirus / enterovirus	No	No
<i>Bordetella pertussis</i>	Yes	Yes
<i>Bordetella parapertussis</i>	No	Yes
Negative	No	No

On call Microbiologist is contacted during out of hours by phoning switchboard.

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HISTOPATHOLOGY

Location

Histopathology is located on the 1st floor of Fewston Wing. Histopathology Specimen Reception is found on the right just after the 2nd set of double doors after passing the exit to Herriot's Restaurant.

Opening Hours

08:45 to 17:00 hrs, weekdays only. Please note that the Histopathology Department is not open at weekends or Public Holidays and it does not provide an on call service.

Staff Contact Details

Name	Job Title	Tel. No.	email
Dr C. Gray	Consultant Histopathologist	01423 553071	carl.gray1@nhs.net
Dr C. lo Polito	Consultant Histopathologist	01423 553107	c.lopolito@nhs.net
Dr D Scott	Consultant Histopathologist	01423 555664	daniel.scott1@nhs.net
Dr E Millward	Consultant Histopathologist	01423 555635	esther.millward@nhs.net
Dr E Tjio	Consultant Histopathologist	01423 555724	e.tjio@nhs.net
Dr I Georgiades	Consultant Histopathologist	01423 555072	Izabela.Georgiades@nhs.net
Dr Katherine Humphris	Consultant Histopathologist	01423 553074	Katherine.humphris@nhs.net
Andrew Whittingham-Hirst	Pathology General Manager – IPS Histopathology & Bradford site		Andrew.whittingham-hirst@nhs.net
Mrs Philippa Bleasdale	Advanced BMS – Section Manager		Philippa.bleasdale1@nhs.net
Mrs T Boughton	Secretary	01423 554443	Tracy.boughton@nhs.net
Mrs A Gillespie-Wilson	Secretary	01423 553072	amanda.gillespie1@nhs.net
Mrs C Johnston	Secretary	01423 554448	Caroline.johnston2@nhs.net

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Contacts for Advice and Interpretation

Clinical enquiries	Consultant Histopathologists	As above
MDT enquiries		Hdft.histology-mdt@nhs.net
General queries, missing reports etc	Histopathology office	ext. 3072 or hdft.histology1@nhs.net
Technical advice, booking frozen sections, fresh tissue arriving	Histopathology Laboratory	ext. 5609

On Call Arrangements

There is no on-call rota for Histopathology. In emergencies, a member of the consultant staff may be contactable via the switchboard.

Communication of Critical and Unexpected Histopathology Results

All Histopathologists are responsible for communicating critical or unexpected results. Biomedical scientists will facilitate the effective, rapid communication of critical unexpected results.

Turnaround Time

Turnaround time depends on a variety of factors. These include the following:

- Size of the sample – larger samples require longer fixation
- Decalcification of samples – bone samples will have a longer turnaround time.
- Time of receipt of the sample in the laboratory – please ensure urgent samples and cytology samples are sent to laboratory as early in the working day as possible.
- Sample referral – If a sample has to be referred to another laboratory for extra tests this will result in a longer turnaround time

In the majority of cases, the turnaround time is likely to be less than that stated below. The times given have been designed to meet the needs of users whilst allowing Histopathology to carry out any extra tests that may be needed for the report. If the turnaround time is likely to exceed those stated below an interim report will be issued.

The targets that the department aims to meet are as follows:

Urgent specimens	90% reported within 7 calendar days
	98% reported within 10 calendar days
Non-urgent specimens	90% in 14 calendar days

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Should the degree of urgency for a request change, please contact the laboratory and follow up with an email to hdfh.histology1@nhs.net

PLEASE NOTE THE TURNAROUND TIME IS FROM RECEIPT OF THE SAMPLE IN THE LABORATORY, NOT THE TIME YOU TAKE IT. IF SAMPLES ARRIVE LATE IN THE DAY AND CANNOT BE PLACED ON OUR OVERNIGHT PROCESSOR THEN IT WILL BE PROCESSED OVER THE FOLLOWING NIGHT INCREASING THE TURNAROUND TIME.

Factors Affecting Test Performance

It is important that all histopathology and non-gynaecological specimens sent to Histopathology arrive no later than **16:45 hrs** to allow adequate time for preparation. Specimens will be accepted up until 1700 hrs but these specimens may be subject to a 24 hour delay in the turnaround time. If you are unable to get the sample to Histopathology by 17:00 hrs please ensure the specimen is retained in the clinical area. Non-gynaecological specimens should be refrigerated; this will help preserve cellular viability. For histopathology specimens ensure that an adequate amount of formalin is present in the container, these do not need to be refrigerated. The specimen should be submitted early the next working day. **Please note that Histopathology does not open bank holidays and weekends.**

Histopathology and cytology are both vulnerable to sampling errors, and to errors of interpretation. If you have doubts about the diagnosis, or if the diagnosis does not seem to fit the clinical picture, always ask for a review of the histology or cytology, and provide all the relevant clinical information. The Consultant Pathologists are always willing to discuss individual cases and to give advice when they can. Contact may be made by phone or via e-mail.

When submitting bone or calcified tissue for analysis please be aware that the decalcification process required for sampling may have an effect on the antigenicity of the tissue in immunohistochemical testing. This could introduce uncertainty in staining, and is considered by the reporting Pathologist.

Measurement of Uncertainty

The majority of diagnostic services provided by Histopathology are not numeric and, therefore, reports cannot be traced back or related to national or international standards of measurement.

Uncertainty in reporting is minimised by:

- Pathologists seeking a second opinion.
- Discussion of results at multidisciplinary team meetings.
- Reference to published descriptions of pathology.
- Internal quality control.

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- Participation in relevant external quality assurance (EQA) schemes and / or proficiency testing.
- Equipment / reagents sourced from reputable suppliers, verified before use, serviced and calibrated as required.

Uncertainty may arise from many sources including:

- An inappropriate or inadequate specimen being taken.
- Inadequate fixation.
- Delayed transport to the laboratory.
- Inadequate storage of specimens.
- Inadequate training or supervision of staff.
- Malfunctioning equipment.
- Inadequate internal quality control of staining results.
- Unresolved poor performance in EQA schemes.

The department addresses these issues by:

- Compliance with standard operating procedures.
- Training and competency assessment for staff.
- Resolution of poor performance / non conformities.
- Equipment / reagents sourced from reputable suppliers, serviced and calibrated as required.

Requests for Additional Examinations

Requests for additional examinations must be made as soon as possible, following the laboratory's receipt of the specimen. These requests must be made by telephone and followed up with an email to the reporting pathologist. Depending on the nature of the specimen, and the request made, be aware that it may not be possible to accommodate your request although every effort will be made to do so, if clinically relevant.

Requests for additional examinations made at MDT meetings are recorded in the minutes of the meeting and also emailed by the MDT coordinator to hdft.histology1@nhs.net. Requests made directly by the oncology team are sent by email to hdft.histology1@nhs.net.

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requests

Routine	Fixation	Routine Turnaround times (If urgent please indicate urgent on form)	Comments, Special precautions, information required	Specimen retention time	Investigation performed at
Urgent histology for small biopsies on cancer pathway All cases are stained by Haematoxylin and Eosin (H&E) stain	10% formalin	7 calendar days	Site. Reason for biopsies	Minimum 6 weeks – wet tissue Blocks and slides – 30 years	HDH (in-house)
Urgent Cytology Depending of type of specimen: Papanicolaou (PAP) stain, H&E stain and May Grunwald-Giemsa (MGG) Stain	Cytology in universal (fresh or in cytorich Red- depending of type of specimen- see next rows on this table)	7 calendar days	Site. Type of specimen: Fluid, FNA	Minimum 6 weeks – Cytology fluid Blocks and slides – 30 years	HDH (in-house)
Routine biopsies and large resection All cases are stained by H&E stain	10% Formalin	14 calendar days	Site. Reason for resection	Minimum 6 weeks – wet tissue Blocks and slides – 30 years	HDH
Effusions for cytology All cases stained by PAP,H&E and MGG. Preparation of cellblock. Stained by H&E	Fresh, no fixative. Place in universal container	10 calendar days	Provide clinical details, especially if mesothelioma suspected. Do not submit in receiving set. Send as early in the working day as possible.	Minimum 6 weeks	HDH
Fine Needle Aspiration Cytology All cases stained by PAP Staining and H&E. Preparation of cellblock.	Place in a universal container with CytoRich Red added	10 calendar days		Minimum 6 weeks – Cytology	HDH

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Stained by H&E				fluid Blocks and slides – 30 years	
EBUS FNA Preparation of Cellblock. Stained by H&E	Place in a universal container with CytoRich Red added	10 calendar days		Blocks and slides – 30 years	HDH
Urine All cases stained by PAP Staining	Fresh, in universal container	10 calendar days	Do not submit early morning urine, as cells will be degenerate. Submit second voiding of the day. State if obtained after catheterisation.	Minimum 6 weeks – Cytology fluid slides – 30 years	HDH
Immunofluorescence	Michel's medium	4 weeks	Send to the laboratory immediately. These samples are referred to St John's Institute of Dermatology which results in a longer turnaround time	N/A	St Johns Institute of Dermatology
Immunohistochemistry	10% formalin Embedded in paraffin	In-house: 1-3 calendar days Airedale: 3-4 calendar days HSL: 1-2 weeks QEHB: 2-4 weeks	The sample needs to be fixed in formalin for a minimum of 6 hours	Slides kept for 30 years	HDH Airedale, HSL QEHB
Special stains	10% formalin Embedded in paraffin	1-3 calendar days		Slides kept for 30 years	HDH
HER-2 FISH Testing	10% formalin Embedded in paraffin	2-4 weeks	Reported by HSL	N/A	HSL
Molecular testing 1- MSI+ (test M1.1) 2- Lung NGS Genexus (test M4.13) 3- NTRK (test M227)	10% formalin Embedded in paraffin	1- 15 calendar days 2- 5 calendar days 3- 17 calendar days 4- 5 calendar days	1- Analysed and reported in Newcastle (Genomic Hub) 2- Analysed and reported by all sites (Leeds, Sheffield and	N/A	Samples prepared by WYAAT, Performed at Genomic Hubs

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4- Breast (test M3.6) 5- Melanoma NGS Roche (test M7.1) 6- Melanoma EPIC array (test 7.10) 7- Endometrial -POLE (test M215.5) 8- Ovarian (test M2.5) 9- Prostate (test M218.1) 10- Urothelial (test M217.1) 11- GIST (test M8.1) 12- Thyroid (test M9.1) 13- Others (less common)		5- 17 calendar days 6- 15 calendar days 7- 17 calendar days 8- 17 calendar days 9- 28 calendar days 10- 5 calendar days 11- 17 calendar days 12- 17 calendar days 13- 14 to 28 calendar days	Newcastle) 3- Analysed and reported by all sites 4- Analysed and reported in Sheffield 5- Analysed and reported by all sites 6- Analysed and reported by all sites 7- Analysed and reported in Leeds 8- Analysed and reported by all sites 9- Analysed and reported by all sites 10- Analysed and reported in Sheffield 11- Analysed and reported in Leeds 12- Analysed and reported in Sheffield 13- Genomic Hubs		– see comments for individual tests
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Sample Handling and Transport

The department usually receives tissues fixed in 10% formalin fixative. **See exceptions below.** Other fixatives may cause severe distortion of tissues rendering diagnosis impossible. Samples will not be accepted out of hours. If samples cannot be delivered before 17:00 pm they must be kept in the clinical area and delivered to Histopathology the following morning.

Please refer to the Trust Policy 'TRANSPORT OF HISTOPATHOLOGY SPECIMENS POLICY' available on PolicyStat.

Urgent Samples

Urgent samples must be clearly marked **URGENT**. Please only mark those samples requiring an urgent report as urgent. Specimens require overnight processing for optimal technical results. Please telephone laboratory (ex 5609) when sending urgent samples to ensure same day processing. Please indicate 2-week wait pathway.

Fresh Tissue

If the specimen being sent is a fresh piece of tissue, please contact the Histopathology laboratory to inform the staff that the tissue is being sent. This will ensure they are able to handle the request appropriately.

Theatre Samples

All theatre specimens **must be transported directly to Histopathology Reception**. They should not be transported to clinical sciences reception. If they cannot be delivered before 17:00 pm then they must be kept in Theatres and delivered early the following morning.

Small containers containing 10% formalin fixative are ordered by individual departments. The histopathology department only supplies large, empty containers to which formalin fixative obtained by requisition from pharmacy stores (ext. 3087) may be added.

Exceptions for sample fixation are:

- [Frozen sections](#)
- [Skin immunofluorescence](#) - specimens received locally and dispatched to St John's Institute of Dermatology for analysis
- [Lymphomas and haematological malignancy](#) – specimens received locally and dispatched to HMDS at St James's University Hospital
- [Cytogenetics samples](#) – to be sent directly (not via histopathology)
- [Muscle biopsies](#) for enzyme histochemistry – to be sent directly (not via Histopathology)
- [Ophthalmic Specimens](#)

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Frozen Sections – No fixative required

Consultant availability can only be guaranteed through prior notification by telephone (Ext. 5609). Specimens for frozen section should be taken **unfixed** immediately to Histopathology reception (first floor, Fewston Wing). They should be handed in person directly to a member of Histopathology laboratory staff. The request form should include details of the operating theatre being used and the contact telephone number for the report.

There is no formal out of hours service for frozen sections available, however, a Consultant Histopathologist may be available for advice. Please contact Switchboard.

Reporting - a verbal report will be made to the requesting clinician as soon as possible. A final report will be issued after paraffin processing. Please note that frozen sections are not within the accredited scope of the laboratory.

Skin biopsies for Immunofluorescence – Michel's Medium

The specimen should be placed in the small bottles containing Michels medium that are supplied and sent directly to Histopathology reception (first floor, Fewston Wing) 0900–17:00 hours Mon-Fri. The request form should clearly indicate that immunofluorescence is required. **Specimens must be received before 16:30 hours.** These specimens may be sent via the POD system to station 2.

Reporting - the reporting Histopathologist at St John's Institute of Dermatology is responsible for the interpretation and reporting of immunofluorescence samples. Reports will be added to the corresponding in house histopathology report and will be available on ICE. Clinical advice and interpretation is available via the multidisciplinary team meetings (MDTs), and from the reporting pathologist. If this pathologist is not available, other pathologists from the same specialty will provide this service.

Immunohistochemistry (IHC)

Antibody	Sample	TAT	Where performed
AE1/3	Formalin fixed, paraffin embedded (FFPE)	1-3 calendar days	In-house
BEREP-4	FFPE	1-3 calendar days	In-house
CA-125	FFPE	1-3 calendar days	In-house
CALRETININ	FFPE	1-3 calendar days	In-house
CAM 5.2	FFPE	1-3 calendar days	In-house

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CD34	FFPE	1-3 calendar days	In-house
CD56	FFPE	1-3 calendar days	In-house
CEA	FFPE	1-3 calendar days	In-house
CHROMOGRANIN	FFPE	1-3 calendar days	In-house
CK 5/6	FFPE	1-3 calendar days	In-house
CK7	FFPE	1-3 calendar days	In-house
CK14	FFPE	1-3 calendar days	In-house
CK20	FFPE	1-3 calendar days	In-house
DESMIN	FFPE	1-3 calendar days	In-house
E-CADHERIN	FFPE	1-3 calendar days	In-house
EMA	FFPE	1-3 calendar days	In-house
ER	FFPE	1-3 calendar days	In-house
GATA-3	FFPE	1-3 calendar days	In-house
GCDFP-15	FFPE	1-3 calendar days	In-house
HER-2 (excluding gastric)	FFPE	1-3 calendar days	In-house
HMB45	FFPE	1-3 calendar days	In-house
H. PYLORI	FFPE	1-3 calendar days	In-house
LCA/CD45	FFPE	1-3 calendar days	In-house
MELAN-A	FFPE	1-3 calendar days	In-house
PAX8	FFPE	1-3 calendar days	In-house
P16	FFPE	1-3 calendar days	In-house
P53	FFPE	1-3 calendar days	In-house
P63	FFPE	1-3 calendar days	In-house
PR	FFPE	1-3 calendar days	In-house
PRAME	FFPE	1-3 calendar days	In-house
PSA	FFPE	1-3 calendar days	In-house
S100	FFPE	1-3 calendar days	In-house
SMA	FFPE	1-3 calendar days	In-house
SMM	FFPE	1-3 calendar days	In-house
SOX-10	FFPE	1-3 calendar days	In-house
SYNAPTOPHYSIN	FFPE	1-3 calendar days	In-house
TTF-1	FFPE	1-3 calendar days	In-house
CDX-2	FFPE	1-3 calendar days	In-house
WT-1	FFPE	1-3 calendar days	In-house
MMR (MLH1, MSH2, MSH6, PMS2)	FFPE	Gastric – 2-4 weeks Endometrial and colorectal- 3-4 calendar days	Gastric – QEHB Endometrial and colorectal- Airedale
HER-2 gastric	FFPE	2-4 weeks	QEHB
PD-L1 gastric	FFPE	2-4 weeks	QEHB
Ca19.9	FFPE	3-4 calendar days	Airedale

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CD10	FFPE	3-4 calendar days	Airedale
CD117	FFPE	3-4 calendar days	Airedale
CD20	FFPE	3-4 calendar days	Airedale
CD3	FFPE	3-4 calendar days	Airedale
CD68	FFPE	3-4 calendar days	Airedale
CK5	FFPE	3-4 calendar days	Airedale
D2-40	FFPE	3-4 calendar days	Airedale
DOG1	FFPE	3-4 calendar days	Airedale
Ki67/MIB-1	FFPE	3-4 calendar days	Airedale
Napsin	FFPE	3-4 calendar days	Airedale
Oct 3/4	FFPE	3-4 calendar days	Airedale
PSAP	FFPE	3-4 calendar days	Airedale
Vimentin	FFPE	3-4 calendar days	Airedale

Requests for antibodies not routinely held in-house are either sent to Airedale Histopathology Department (see table above) or HSL Advanced Diagnostics. Check a list of current available antibodies for HSL- [Clinical Antibodies \(IHC\) | IHC | HSL Advanced Diagnostics](#).

Special Stains

Special stains repertoire in Harrogate		
Special stain	Sample	TAT
Alcian Blue	FFPE	1-3 calendar days
Alcian Blue / PAS	FFPE	1-3 calendar days
PAS+/-Diastase	FFPE	1-3 calendar days
Highman's Congo Red	FFPE	1-3 calendar days
Elastic Van Gieson	FFPE	1-3 calendar days
Gordon & Sweets' Method	FFPE	1-3 calendar days
Gram Stain	FFPE	1-3 calendar days
Grocott Methenamine Silver	FFPE	1-3 calendar days
Martius, Scarlet, Blue (MSB)	FFPE	1-3 calendar days
Masson Fontana	FFPE	1-3 calendar days
Masson Trichrome	FFPE	1-3 calendar days

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Perls' Prussian Blue	FFPE	1-3 calendar days
Shikata Orcein	FFPE	1-3 calendar days
Ziehl-Neelson	FFPE	1-3 calendar days

Lymphoma and Haematological Malignancy Specimens

Lymphoma diagnosis is based on a combination of routine histopathology on formalin-fixed tissue and immunophenotyping studies performed on fresh unfixed tissue. If a whole lymph node then please send fresh as soon as possible directly to the department of Histopathology. A portion of fresh tissue will be transported to the HMDS laboratory at St. James's University Hospital. The remaining tissue is placed in formalin fixative and processed for routine histopathology at Harrogate. If there is more than one biopsy then please send one in formalin fixative for routine histopathology and place the other biopsy in saline and send both to the Histopathology Department.

Skin biopsy for possible cutaneous lymphoma – send immediately in saline soaked gauze.

Reporting - HMDS is responsible for the interpretation and reporting of samples. Results are sent directly to the referring clinician. HMDS has senior staff experienced in all aspects of the diagnosis of haematological malignancies. If you are unsure of who to contact please call 0113 2067851 and ask to speak to any of the consultants or clinical scientists who will be able to direct your enquiry appropriately.

Cytogenetic Samples

Send in transport medium (RPMI) directly to the Leeds Genetics Laboratory based at St James Hospital, Leeds. **DO NOT** send to Histopathology. Requests must include clinical history and reason for request. Samples should be collected into a sterile Universal container containing culture medium (Ham's F10) and antibiotics. If no transport medium is available, it is possible to send the tissue in sterile isotonic saline, or in a dry sterile vessel. These samples should be sent to the laboratory without delay.

Please see [The Leeds Genetics Laboratory, Tissue Sample \(leedsth.nhs.uk\)](http://leedsth.nhs.uk). Here you can find information on sending samples to the laboratory and order medium by following the links at the bottom of their homepage.

They supply medium at no cost as part of the service. **N.B Harrogate District Hospital Histopathology department no longer supplies RPMI.**
Requests are sent to:

North East & Yorkshire Genomic Laboratory Hub, Central Lab

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Genomic Specimen Reception (Histopathology Department)
 Bexley Wing (Level 5)
 St. James's University Hospital
 Beckett Street
 Leeds
 LS9 7TF

Reporting - the Leeds genetics laboratory is responsible for the interpretation and reporting of cytogenetic samples. Results are sent to the referring clinician. Complex abnormal results are usually telephoned prior to the written report being sent and the interpretation and implication discussed. In response to telephone enquiries, only normal results or those which confirm a previous finding are given to a clinician's secretary or the clinic sister. All other results are only given to clinicians or faxed reports are sent to designated contacts.

Muscle Biopsies

For **ALL** muscle biopsies the following protocol must be followed:

- The Specialist Histopathology department at St James university Hospital **MUST** be informed by telephoning 0113 2064710 when a muscle/nerve is being sent and also of the expected time of arrival.
- Biopsies should arrive no later than 16:00 pm.
- Muscle for histological and histochemical analysis can be sampled as either an open biopsy or a needle biopsy.
- Muscle from an open biopsy should measure approximately 2.5 cm in length and 0.5 cm in diameter. Alternatively 2 or 3 samples (0.5 x 0.5 cm) should be obtained if the procedure involves using a biopsy needle (Conchotome).
- Place the sample/s into a screw top container or petri dish, which contains damp **but not wet** saline gauze. The gauze should not come into direct contact with the muscle.
- If a nerve biopsy is also to be sent, take a sample 2.0-3.0 cm in length. Keep the nerve straight and cover with a **damp but not wet** saline gauze before placing in a screw top container or petri dish.
- Place the screw top container/petri dish containing the samples into a leak proof box, include a request form and send by taxi or courier to:

The Specialist Histology Unit via;
 Pathology Reception, Ground Floor of Block 32,
 Chancellor Wing
 St James's University Hospital
 Beckett Street
 LEEDS
 LS9 7TF

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NB The screw top container/petri dish should be surrounded by ICE (not dry ice) if the sample is likely to take longer than 1 hour before it arrives at the specialist histopathology department at St James.

Ophthalmic Specimens

The NHS National Commissioning Group has designated laboratories to undertake specialist eye and ocular adnexal pathology reporting. Areas of expertise include orbital and adnexal neoplasia, ocular and adnexal trauma, degenerative eye conditions; corneal and ocular surface pathology, paediatric and developmental conditions, and infectious disease. All Ophthalmic samples will therefore be referred to the National Specialist Pathology Service at Manchester Royal Infirmary. They accept fixed tissue, fresh (conjunctival) specimens for immunofluorescence and cytology specimens.

Reporting – The National Specialist Pathology Service is responsible for the interpretation and reporting of Specimens. Results are sent directly to the referring clinician. The service can be contacted on 0161 276 8808.

High Risk Specimens

All high risk specimens must be clearly labelled as such on both the specimen and request form

Non-Gynaecological Cytology

Effusions for cytology should be sent fresh (no fixative) in a conical universal container. Do not send in taking sets. Send no more than 20 mL in each universal sent.

Fine needle aspiration cytology – send in cytospin fluid in a universal container. Fixed slides should no longer be sent.

Urine – send fresh in a conical universal container, not a boric acid microbiology container.

Use a routine histopathology form for all samples

Sputum Cytology

N.B. Sputum cytology should not be used as one of a battery of investigations when admitting a patient with chest infection or recent

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exacerbation of chronic bronchitis. It cannot be used to exclude carcinoma due to inherently low sensitivity.

Sputum cytology is considered appropriate in the following circumstances:

- To obtain a histological diagnosis in individuals with a **persistent** abnormality (usually radiological) in whom bronchoscopy is clinically inappropriate.
- To obtain a histological diagnosis of peripheral lung lesions where bronchoscopy is unlikely to obtain diagnostic material.
- For certain non-neoplastic conditions such as atypical asthma, where cytological constituents may aid diagnosis.

If a request for inappropriate sputum cytology is sent to Histopathology the department will register it on the laboratory management system but the sample will not be processed. A pathologist will email the requesting clinician to inform them the sample has been rejected. A report will be issued on ICE reflecting this. These reports will be highlighted with a red flag.

Cervical Cytology

The cervical cytology service is provided by Gateshead Health NHS Foundation Trust. All enquiries regarding supplies of consumables and results should be made using the contact details below:

General Enquiries	email: ghnt.neycervicalscreeningcentre@nhs.net
	Telephone: 0800 953 7610
IT Issues	email: ghnt.pathsupport@nhs.net
	Telephone: 0191 445 6504
Supplies	email: ghnt.hpv-supplies@nhs.net
Address:	NEY Cervical Screening Service The Pathology Centre Queen Elizabeth Hospital Sheriff Hill Gateshead NE9 6SX

Placentas, Foetuses & Cytogenetics

Placentas

Routine placentas are not sent for histopathology. Placentas should only be submitted if they appear abnormal; or if the baby is abnormal, unwell or stillborn; or following a pregnancy affected by medical complications. Microbiology samples should be taken on the ward and sent to microbiology, prior to placing the placenta in formalin. Placentas should be submitted in formalin, accompanied by a completed "Request for Histopathology" form.

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This should include the obstetric history and reason for histopathology request.

Foetuses and Foetal Material

Foetuses and embryos less than 24 weeks' gestational age have no legal identity as an individual, and are examined and recorded as histopathology requests in the Histopathology laboratory. However, it is the policy of the Histopathology department is to accord all recognisable babies the respect due to human life. Details of the policy and procedures for dealing with foetal material are given in the "Management of Pregnancy Remains Policy" under the Trust Wide tab at the top of the intranet home page and then Care and Procedures after Death, then policies. All foetal tissue submitted to the Histopathology department must be accompanied by a request form that indicates whether or not histological examination is required, the gestational age, and confirm that the mother has given consent for respectful disposal. A sticker summarising this information is available in theatre and on relevant wards to fix to the standard request form. The foetal material should be submitted in formalin (cytogenetic and microbiology samples should be taken on the ward prior to fixation).

If internal examination of a recognisable foetus is required, the foetus must be accompanied by a post-mortem request form signed by one of the parents, preferably the mother. At present consent is recorded on the NHS form "Consent to a hospital post mortem examination on a baby or child ". If no forms are available on the ward a copy may be printed from "Families and post mortems: a code of practice", pages 30-37, then photocopied to provide copies for the notes, the Histopathology Department and the mother.

Foetuses and stillbirths over 24 weeks' gestational age, and live born infants dying in the perinatal or neonatal periods, have a legal identity. A death certificate is required, and the babies are examined and reported as post mortem examinations at the mortuary (see the Mortuary section)

Reference Laboratories

The laboratory may refer tissue for additional analysis on a case by case basis. The primary referral location is the Histopathology Department, Airedale General Hospital (which is accredited by UKAS). For further information on the referral process, please contact the Histopathology laboratory using the details on page 97.

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MORTUARY

Location of Mortuary

The mortuary is located on the ground floor of Harrogate District Hospital next to the switchboard room. Access is restricted by means of swipe card access. An intercom system is available at both entrances for visitors to the department. There is vehicular access for funeral directors and emergency services via Willaston Crescent.

Opening Hours

08:00 to 16:00 hrs, weekdays only.

Please note that the mortuary is not open at weekends or Public Holidays. An on call service operates out of hours and staff are contactable via switchboard

Contact Details

Mortuary Clinical Lead	Telephone	e-mail
Dr Kate Humphris	01423 553074	katherine.humphris@nhs.net

Consultant Staff

Dr Carl Gray	01423 553071	carl.gray1@nhs.net
Dr Daniel Scott	01423 555664	daniel.scott1@nhs.net
Dr Elza Tjio	01423 555724	e.tjio@nhs.net

Mortuary Manager

Mr Andrew Cooper	01423 553391
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Mortuary Office	01423 553391
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Policies relating to death and bereavement are available from HDFT PolicyStat including:

Care in the Last days/hours of Life and Care after Death (Adults) under the care of HDFT (Hospital and Community)

Policy and Procedure for Taking Post Mortem Consent Adult

Guide to the Post-Mortem Examination of a Baby (Leeds)

Advice on Death Certification, Coroner's Cases and Cremation

Death Certification

All deaths are scrutinised by the Medical Examiners team who issue death certificates.

Reporting Deaths to the Coroner

All unexplained or unexpected death are reportable to the Coroners

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Officer/Police as soon as possible. The Coroner is informed prior to the removal of any organs or tissues for transplant purposes where the death is notifiable to him or likely to be so.

For Indications for reporting deaths to the coroner please refer to Standard Operating Procedure (SOP) for Referral to the Coroner available on HDFT PolicyStat.

The Coroner will issue all legal paperwork when a post mortem examination has been requested.

Hospital Consent Post-mortem Examination

Adult Consent Post-mortem Examination

Following a death within HDFT, the decision to request a post-mortem examination must be made by senior members of medical staff in discussion with the Consultant Histopathologist prior to requesting consent. The Consultant Histopathologist will also take the consent. The next of kin must be invited to attend the hospital to discuss the request for post mortem examination and give consent. Consent paperwork must be sent to the Mortuary Department along with the medical notes.

Consent Forms are available on the following policy available on HDFT PolicyStat:

Adult Post Mortem Request, Consent Form

Paediatric Consent Post-mortem Examination

Consent for a paediatric post mortem examination is taken by trained staff in the maternity department in discussion with the next of kin and clinicians. Consent paperwork must be sent to the Mortuary Department.

Consent Forms:

These are held in the maternity department.

Paediatric post mortem examinations take place at a specialist centre at St James Hospital, Leeds.

Post Mortem Requests from General Practice

A GP may request a post mortem examination. The GP must obtain written and informed consent from the next of kin or executor acting on behalf of the deceased, and must use the HDFT consent form. The request should be discussed with a Consultant Histopathologist.

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Viewing of the Deceased

Viewing of the deceased in the mortuary department is by appointment only. To arrange a viewing within working hours contact the Mortuary Department extension number 3391. To arrange viewing out of hours please contact the clinical site manager via switchboard.

Please see the following policies for further information, available on HDFT PolicyStat.

Procedure for the viewing of a deceased at Harrogate District Hospital Mortuary
 Procedure for the viewing of a deceased in Harrogate District Hospital Mortuary
 Policy on a page

Organ and Tissue Donation

NHS Blood and Transplant (NHSBT) manages the national voluntary donation system for blood, tissues, organs and stem cells turning these precious donations into products that can be used safely to the benefit of the patient.

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Appendix 1

How to collect a faeces (stool, motion) specimen for microbiological examination

Before collecting the specimen, make sure your name, date of birth, hospital number and date of the sample is on the specimen container.

Method 1: using a child's potty, a chamber pot, a commode or a suitable container (empty plastic margarine or ice cream tub which will not be required for any other purpose after such use)

- Clean the chosen container thoroughly with soap or detergent and water (DO NOT use disinfectant, bleach or cleaners containing bleach) and give a final rinse in clear water.
- Pass a motion into the container
- Open the specimen bottle and with the little spoon attached to the lid, scoop up enough of the motion to cover the bottom of the bottle
- Replace the lid securely on the bottle
- Dispose of the remainder of the motion down the toilet and either clean thoroughly, or dispose of the container in which the specimen was collected (replace lid of margarine or ice cream tub and put into the dustbin)
- Use and dispose of toilet paper down the toilet in the usual way
- Wash your hands thoroughly with soap and hot running water

Method 2: using cling film

- Raise the toilet seat and loosely place a sheet of cling film across the rim of the toilet bowl to stop anything from falling into the bowl
- The cling film should not be tight – it should have a dip in the centre.
- Place the toilet seat down. You can then sit as normal on the toilet seat.
- Pass a motion onto the cling film
- Open the specimen bottle and with the little spoon attached to the lid, scoop up enough of the motion to cover the bottom of the bottle
- Dispose of the remainder of the motion down the toilet and discard the cling film into a clean polythene bag, tie it and put into the dustbin
- Use and dispose of toilet paper down the toilet in the usual way
- Wash your hands thoroughly with soap and hot running water

REMEMBER: Do not collect faecal specimens that have fallen into the toilet bowl or toilet water. No matter how clean your toilet is, it will always contain some bacteria that will interfere with the test results.

For babies, a faeces (stool, motion) sample can be taken directly from a soiled nappy. (For most tests, it does not matter if a small amount of urine is accidentally passed into the pot, cling film or nappy with the faeces)

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Appendix 2

Instructions for Obtaining Patient-Collected APTIMA Vagina Swab Specimens



NOTE: If you have any questions about this procedure, please ask your doctor, nurse or care-provider.

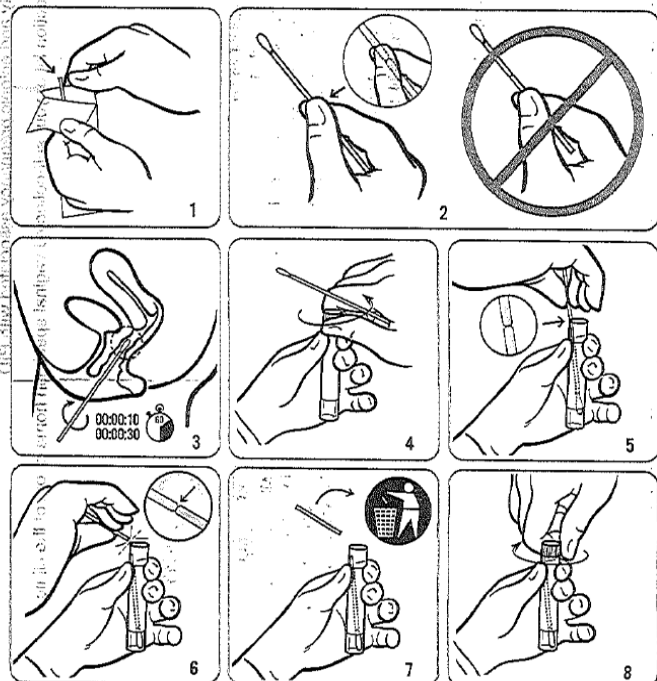
Wash your hands before starting.

In the privacy of the examination room or restroom, you will need to undress from the waist down. You will need to comfortably position yourself to maintain balance during the collection procedure.

Open kit package and set the tube aside before beginning instructions.

WARNING: If the contents of the tube are spilled on your skin, wash the affected area with soap and water. If the contents of the tube are splashed in your eyes, immediately flush your eyes with water. Notify your doctor, nurse or care-provider if irritation develops. If the contents of the tube are spilled, your test result may be invalidated. Do not take internally.

1. Partially peel open the swab package as shown in Diagram 1. Remove the swab.
Do not touch the soft tip or lay the swab down.
If the soft tip is touched, the swab is laid down, or the swab is dropped, request a new APTIMA Vaginal Swab Specimen Collection Kit.
2. Hold the swab in your hand as shown in Diagram 2, placing your thumb and forefinger in the middle of the swab shaft covering the score line.
Do not hold the swab shaft below the score line.
3. Carefully insert the swab into your vagina about 2 inches (5 cm) inside the opening of the vagina (as shown in Diagram 3) and gently rotate the swab for 10 to 30 seconds. Make sure the swab touches the walls of the vagina so that moisture is absorbed by the swab and then withdraw the swab without touching the skin.
4. While holding the swab in the same hand, unscrew the cap from the tube as shown in Diagram 4.
Do not spill the contents of the tube. If the contents of the tube are spilled, request a new APTIMA Vaginal Swab Specimen Collection Kit.
5. Immediately place the swab into the transport tube so that the score line is at the top of the tube as shown in Diagram 5.
6. Carefully break the swab shaft at the score line against the side of the tube as shown in Diagram 6.
7. Immediately discard the top portion of the swab shaft as shown in Diagram 7.
8. Tightly screw the cap onto the tube as shown in Diagram 8. Return the tube as instructed by your doctor, nurse or care-provider.



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Appendix 3 Blood Sciences Add-On Assay Time Limits



Biochemistry



Haematology

Sample colour dictates container top colour.

**Paediatric patients: Tests for serum samples can be added onto Lithium Heparin samples.*

	TEST	CODE	TIME	ADULT SAMPLE	PAED. SAMPLE
A	Activated Partial Thromboplastin Time Ratio	APTR	4 hours	Sodium Citrate Plasma	Sodium Citrate Plasma
	Alanine Aminotransferase	ALT	5 days	Plain Serum	Plain Serum Clear-Top
	Antinuclear Antibodies	ANA	N/A	Plain Serum	Plain Serum Clear-Top
	Albumin (added with Total protein)	TPALB	5 days	Plain Serum	Plain Serum Clear-Top
	Alcohol	ALCP	3 days	Fluoride Oxalate Plasma	Fluoride Oxalate Plasma
	Alkaline Phosphatase	ALP	5 days	Plain Serum	Plain Serum Clear-Top
	Alkaline Phosphatase Isoenzyme	ALKI	5 days	Plain Serum	Plain Serum Clear-Top
	Alpha Feto Protein	AFP	2 days	Plain Serum	Plain Serum Clear-Top
	Ammonia	AMM	N/A Cannot be added	EDTA Plasma	EDTA Plasma
	Amylase	AM	5 days	Plain Serum	Plain Serum Clear-Top
B	Aspartate Aminotransferase	AST	5 days	Plain Serum	Plain Serum Clear-Top
	Beta-2 Microglobulin	B2M	3 days	Plain Serum	Plain Serum Clear-Top
	Bicarbonate (Includes Chloride)	BICL	4 hours	Plain Serum	Plain Serum Clear-Top
	Bile Acids	BILE	2 days	Plain Serum	Plain Serum Clear-Top
C	Bone Profile	BONE	4 days	Plain Serum	Plain Serum Clear-Top
	C-Reactive Protein	CRP	5 days	Plain Serum	Plain Serum Clear-Top
	CA125	C125	2 days	Plain Serum	Plain Serum Clear-Top
	CA153	C153	2 days	Plain Serum	Plain Serum Clear-Top
	CA199	C199	2 days	Plain Serum	Plain Serum Clear-Top
	Calcium	CA	5 days	Plain Serum	Plain Serum Clear-Top
	CEA	CEA	2 days	Plain Serum	Plain Serum Clear-Top

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	TEST	CODE	TIME	ADULT SAMPLE	PAED. SAMPLE
	Cholesterol	CHO	5 days	Plain Serum	Plain Serum Clear-Top
	Clotting screen (PT+APTT)	COAGH	4 hours	Sodium Citrate Plasma	Sodium Citrate Plasma
	Complement C3 (Includes C4)	COM3	5 days	Plain Serum	Plain Serum Clear-Top
	Complement C4 (Includes C3)	COM4	5 days	Plain Serum	Plain Serum Clear-Top
	Conjugated Bilirubin	SBIL	1 day (>24hrs refer to BMS)	Plain Serum	Plain Serum Clear-Top
	Cortisol	CORT	2 days	Plain Serum	Plain Serum Clear-Top
	Creatinine	CREP	5 days	Plain Serum	Plain Serum Clear-Top
	Creatine Kinase	CK	12 hours	Plain Serum	Plain Serum Clear-Top
D	DDimer	DDIM	4 hours Only add-on once APTT and PT results are available in WinPath Inform a BMS	Sodium Citrate Plasma	Sodium Citrate Plasma
	Digoxin	DIG	5 days	Plain Serum	Plain Serum Clear-Top
E	Electrophoresis	PE	5 days	Plain Serum	Plain Serum Clear-Top
	Erythrocyte Sedimentation Rate	ESR	N/A Unable to add-on due to specific test tube and protocol	ESR Sodium Citrate Black-Top	ESR Sodium Citrate Black-Top
F	Ferritin	FER	2 days	Plain Serum	Plain Serum Clear-Top
	Fibrinogen (Clauss Fibrinogen)	FIB	4 hours Only add on once APTT and PT results are available in WinPath Inform a BMS	Sodium Citrate Plasma	Sodium Citrate Plasma
	Film	FILM	<24 hours	EDTA Whole blood	EDTA Whole blood
	Folate	FOL	2 Days	Plain Serum	Plain Serum Clear-Top
	Free T3	FT3	2 days	Plain Serum	Plain Serum Clear-Top
	Free T4	FT4	2 days	Plain Serum	Plain Serum Clear-Top
	FSH & LH	FL	2 days	Plain Serum	Plain Serum Clear-Top
	Full Blood Count (Includes RET)	FBC	24 hours Can only be added if there is a spare	EDTA Whole blood	EDTA Whole blood

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	TEST	CODE	TIME	ADULT SAMPLE	PAED. SAMPLE
		(RET- this will reflex a FBC as well)	sample or an HbA1c		
G	Gamma Glutamyl Transferase	GGT	5 days	Plain Serum	Plain Serum Clear-Top
	Gentamycin	GENT	5 days	Plain Serum	Plain Serum Clear-Top
	Glucose (Plasma)	GLX	3 days	Fluoride Oxalate Plasma	Fluoride Oxalate Plasma
	Glucose Fasting (Plasma)	GLXF	3 Days	Fluoride Oxalate Plasma	Fluoride Oxalate Plasma
H	Haptoglobin	HAPT	5 days	Plain Serum	Plain Serum Clear-Top
	Haematinics	FER, FOL, B12	Ferritin & Folate can be added within 2 days Vitamin B12 1 day	Plain Serum	Plain Serum Clear-Top
	Haemoglobin Electrophoresis (Sickle Cell testing not screening / Thalassemia / Haemoglobin Variants)	HBOP for non-antenatal HBOP for antenatal	48 hours (up to 72 hours if sample is still in the cold room) Inform a BMS	EDTA Whole Blood	EDTA Whole blood
	Haemoglobin A1c	A1C	1 day	EDTA Plasma	EDTA Plasma
	Haematological Malignancy Diagnostic Service	MDS	*Refer to BMS	EDTA Whole Blood	EDTA Whole blood
	HCG (beta)	HCG	8 hours	Plain Serum	Plain Serum Clear-Top
	HDL Cholesterol	LIPID	5 days	Plain Serum	Plain Serum Clear-Top
	Immunoglobulins (IgA, G, & M)	IGS	5 days	Plain Serum	Plain Serum Clear-Top
I	IgA	IgA	5 days	Plain Serum	Plain Serum Clear-Top
	IgG	IgG	5 days	Plain Serum	Plain Serum Clear-Top
	IgM	IgM	5 days	Plain Serum	Plain Serum Clear-Top
	International Normalised Ratio	INRA	No limit Can only be added if a PT has been tested	Sodium Citrate Plasma	Sodium Citrate Plasma
	Iron	FE	5 days	Plain Serum	Plain Serum Clear-Top
	Lactate	LACT	N/A Cannot be added	Fluoride Oxalate	Fluoride Oxalate
	Lactate Dehydrogenase	LDH	4 days	Plain Serum	Plain Serum Clear-Top
	Lithium	LI	5 days	Plain Serum	Plain Serum Clear-Top
L	Lipids (Triglyceride + Cholesterol)	LIPID	5 days	Plain Serum	Plain Serum Clear-Top

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	TEST	CODE	TIME	ADULT SAMPLE	PAED. SAMPLE
M	Liver Function Test (Total Bilirubin will not be included if >24 hours)	LFT	1 Day (1-5 days, refer to BMS)	Plain Serum	Plain Serum Clear-Top
	Magnesium	MG	5 days	Plain Serum	Plain Serum Clear-Top
	Malarial Parasites	MP	48 hours (up to 72 hours if sample is still in the cold room) Inform a BMS	EDTA Whole Blood	EDTA Whole Blood
O	Oestradiol	OE2	5 days	Plain Serum	Plain Serum Clear-Top
	Osmolality	OSMO	3 days	Plain Serum	Plain Serum Clear-Top
P	Paracetamol	P	2 days	Plain Serum	Plain Serum Clear-Top
	Parathyroid Hormone	PTH	N/A Cannot be added	EDTA Plasma	EDTA Plasma
	Paul Bunnell	IM	48 hours (up to 72 hours if sample is still in the cold room) Inform a BMS	Plain Serum (preferred)	Plain Serum (preferred) Clear-Top
	Paul Bunnell	IM	48 hours (up to 72 hours if sample is still in the cold room)	EDTA Whole Blood	EDTA Whole Blood
	Phosphate	PO4	4 days	Plain Serum	Plain Serum Clear-Top
	Plasma Viscosity	PV	24 hours (From sample received to tested at Leeds) Haematology + Rheumatology Consultants only Sample cannot be used if refrigerated Inform the BMS	EDTA Whole Blood	EDTA Whole Blood
	Progesterone	PROG	N/A Cannot be added	Plain Serum	Plain Serum Clear-Top
	Procalcitonin	PCAL	2 days	Plain Serum	Plain Serum Clear-Top
	Prolactin	PROL	2 days	Plain Serum	Plain Serum Clear-Top

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	TEST	CODE	TIME	ADULT SAMPLE	PAED. SAMPLE
R S	Prostate Specific Antigen	PSA	1 day	Plain Serum	Plain Serum Clear-Top
	Rheumatoid Factor	RF	1 day	Plain Serum	Plain Serum Clear-Top
	Salicylate	S	2 days	Plain Serum	Plain Serum Clear-Top
	SARS-Cov-2 IgG	COV2	5 days	Plain Serum	Plain Serum Clear-Top
	Split Bilirubin	SBIL	1 day (>24hrs refer to BMS)	Plain Serum	Plain Serum Clear-Top
	Serum Glucose (In-patients only) Fasting Serum Glucose (In-patients only)	GLU GLUF	2 hrs	Plain Serum	Plain Serum Clear-Top
	Serum Light chains	SFLC	5 days	Plain serum	Plain Serum Clear-Top
	Sex Hormone Binding Globulin	SHBG	5 days	Plain Serum	Plain Serum Clear-Top
T	Sickle Cell Screen / Sickle Solubility Test	SICK	48 hours (up to 72 hours if sample is still in the cold room) Inform a BMS	EDTA Whole Blood	EDTA Whole Blood
	Testosterone (Male)	TEST	2 days	Plain Serum	Plain Serum Clear-Top
	Theophylline	THEO	5 days	Plain Serum	Plain Serum Clear-Top
	Thyroid Function Test	TSH	5 days	Plain Serum	Plain Serum Clear-Top
	Total Bilirubin	TBIL	1 day	Plain Serum	Plain Serum Clear-Top
	Total Protein (Includes Albumin)	TPALB	5 days	Plain Serum	Plain Serum Clear-Top
	Thyroid Peroxidase	TPO	2 days	Plain Serum	Plain Serum Clear-Top
	TIBC, Iron Saturation	ISAT	5 days	Plain Serum	Plain Serum Clear-Top
	Triglycerides	TG	5 days	Plain Serum	Plain Serum Clear-Top
	Troponin I	TNI	N/A Cannot be added	Plain Serum	Plain Serum Clear-Top
	Thyroid Stimulation Hormone	TSH	5 days	Plain Serum	Plain Serum Clear-Top
U	Urea & Electrolytes	UE	5 days	Plain Serum	Plain Serum Clear-Top
	Urea & Electrolytes (Full Panel) (Bicarbonate not included if sample >4 hours)	UE	5 days (4 days for a closed anaerobic sample) Inform BMS	Plain Serum	Plain Serum Clear-Top
	Uric Acid	UA	5 days	Plain Serum	Plain Serum Clear-Top

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TEST	CODE	TIME	ADULT SAMPLE	PAED. SAMPLE
Urine Albumin Creatinine Ratio	ACR	5 days	Plain Urine	Plain Urine
Urine Protein	24TP ((24hr) UP TPC (ratio)	48 Hours	Plain Urine	Plain Urine
Urine Calcium	UCA 24CA (24hr) UCAC (Ratio)	4 Days	Plain Urine	Plain Urine
Urine Creatinine	UCRE 24CR (24hr)	24 Hours	Plain Urine	Plain Urine
Urine Potassium	UEL 24E (24hr)	/	Plain Urine	Plain Urine
Urine Sodium	UEL 24E (24hr)	/	Plain Urine	Plain Urine
Urine Phosphate	UPHO 24PH (24hr) UPO4 (Ratio)	N/A Acidified sample only	Plain Urine	Plain Urine
Urine Uric Acid	UUA 24UA (24hr)	N/A	Plain Urine	Plain Urine
Urine Bence Jones	BJPH	2 Days (if protein not already tested) Or 1 week (if protein already tested)	Plain Urine	Plain Urine
Urine Osmolality	OSMU	3 Days	Plain Urine	Plain Urine
V Vancomycin	VANC	N/A Cannot be added	Plain Serum	Plain Serum Clear-Top
Vitamin B12	B12	1 day	Plain Serum	Plain Serum Clear-Top
Vitamin D	VITD	18 Hours	Plain Serum	Plain Serum Clear-Top

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Appendix 4

How to Collect a Faeces (Stool, Motion) Sample for Calprotectin Testing

Please follow the instructions below

Before collecting the specimen, please label the sample container correctly with ALL the information below:

- Full name (no initials)
- Date of birth
- hospital number or NHS number
- Date the sample has been collected.

Samples will be rejected if they are not labelled with ALL of the above information

How to collect a faeces (stool, motion) specimen for Calprotectin testing

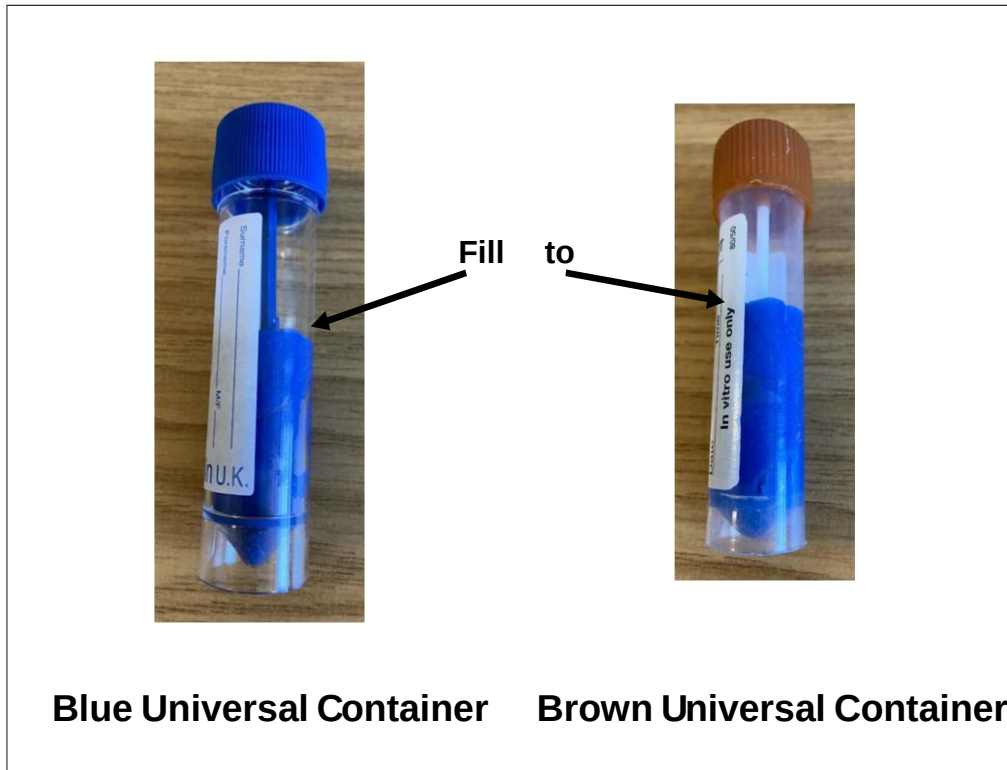
Method 1: using a child's potty, a chamber pot, a commode or a suitable container (empty plastic margarine or ice cream tub, which will not be required for any other purpose after such use)

- Clean the chosen container thoroughly with soap or detergent and water (DO NOT use disinfectant, bleach or cleaners containing bleach) and give a final rinse in clear water.
- Pass a motion into the container
- Open the specimen bottle and with the little spoon attached to the lid, scoop up enough of the motion to half fill the container (see suggested fill line on the diagram below)
- Replace the lid securely on the bottle
- Dispose of the remainder of the motion down the toilet and either clean thoroughly, or dispose of the container in which the specimen was collected (replace lid of margarine or ice cream tub and put into the dustbin)
- Use and dispose of toilet paper down the toilet in the usual way

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- Wash your hands thoroughly with soap and hot running water



Method 2: using cling film

- Raise the toilet seat and loosely place a sheet of cling film across the rim of the toilet bowl to stop anything from falling into the bowl
- The cling film should not be tight – it should have a dip in the centre.
- Place the toilet seat down. You can then sit as normal on the toilet seat.
- Pass a motion onto the cling film
- Open the specimen bottle and with the little spoon attached to the lid, scoop up enough of the motion to half fill the container (see suggested fill line on the diagram above)
- Dispose of the remainder of the motion down the toilet and discard the cling film into a clean polythene bag, tie it and put into the dustbin
- Use and dispose of toilet paper down the toilet in the usual way
- Wash your hands thoroughly with soap and hot running water

REMEMBER: Do not collect faecal specimens that have fallen into the toilet bowl or toilet water. No matter how clean your toilet is, it will always contain some bacteria that will interfere with the test results.

For babies, a faeces (stool, motion) sample can be taken directly from a soiled nappy. (For most tests, it does not matter if a small amount of urine is accidentally passed into the pot, cling film or nappy with the faeces).

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Appendix 5

Instructions for collection of QuantiFERON-TB samples

Please read the instructions carefully before submitting a sample.

There are specific requirements for the QuantiFERON test. Samples have to be incubated in the Microbiology Department before being sent to the reference laboratory, and, therefore, **samples can only be tested if received in the laboratory between 09:00 am-14:00 pm, Monday – Wednesday.**

Instruction for taking Samples

This is best performed by Phlebotomists in the Phlebotomy Outpatients Clinic

1. Request a QuantiFERON tube pack from the Microbiology laboratory (ext 3078).
2. Fill each of the 4 tubes (yellow, green, grey & purple) with **EXACTLY 1.0 mL of blood.**

NB: All four tubes must be filled or the test cannot proceed.

3. Mix by inverting the tube 10 times –**Under-mixing may result in false negative results, but DO NOT shake the tubes**
4. Please ensure that the date and time the blood was drawn is clearly marked on the request form and sample tubes. Failure to do this may result in the sample being rejected.
5. Specimen tubes are to be immediately taken by hand to the Microbiology Laboratory. **DO NOT POD.**
6. Ensure that the tubes, once filled, are NOT REFRIGERATED at any point – the test cannot proceed if this occurs.
7. These tests are batch tested at the reference laboratory with an average TAT of up to two weeks. Single tests will not be performed on an urgent basis.

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