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Revision No.16 Discarded	**16, obsolete date: 27/05/2026**
Revision No.17 Activated	**17, active date: 27/05/2026**
Section(s) involved	**Amendments**
Header	
General	• Update to section 3 introduction. • Addition of Provision of services to GPs (section 9) • Updated Specimen transport section that ambient temp (5-30C) and added: The laboratory will periodically evaluate the adequacy of sample transportation systems to verify ambient temperature conditions are met during transportation. • Updated external transport section: Specimens should be sent to the laboratory as soon as possible (via the next transport courier on the same day of sample collection). Plan sample collection in line with transport options/courier schedule. Specimens should be delivered to the laboratory within routine working hours, Monday to Friday, excluding public holidays, 09:00-16:00 (15:00 on Fridays). It is the responsibility of the external location to store specimens at the temperature conditions recommended for the specific sample and test, to prevent deterioration of the sample and assure accuracy of test results. The laboratory would advise that samples should NOT be centrifuged off-site by external locations unless the practice utilises calibrated equipment in accordance with manufacturer's instructions and in line with criteria for the specific sample and test as detailed in this manual. Only serum separator tube samples may be centrifuged. Where a centrifuge is utilised off-site, it is the responsibility of the practice to ensure The centrifuge is calibrated at a minimum annually by an accredited ISO 17025 supplier of the service Prior to centrifugation, samples should sit for 20-30 minutes at room temperature to allow for clotting and should ideally be kept upright. The speed and duration of centrifugation is compliant with the centrifugation criteria as provided in this manual for the relevant test

	(see relevant test table). Where centrifugation criteria are not provided, do not centrifuge the sample. The centrifuge is used and maintained as per its manufacturer's guidelines Users are trained by the practice on the use of the centrifuge Records of above should be maintained and available for audit if required by SUH. • Updated Specimen transport and packaking instructions to include: It is the responsibility of the consignor to ensure that transport containers are maintained in good condition, are cleaned regularly using detergent and disinfection in the event of a specimen spillage. It is the responsibility of the consignor to ensure that the container is appropriate for the purpose, is properly closed, and is not contaminated on the outside. • Addition of image for packaking instruction from HSE National Guidelines or the Preparation for Transport of Patient Specimens and other Biological Materials 2023. • Addition of Patient consent section • Removed reference to Brown request form • Updated Deviation from Specimen Acceptance Policy to use of PATH-LAB-QR-30 and approved list of exceptions • Added Laboratory reference ranges section • Added Policy on Sharing Patient Data with External Bodies:Transfusion recalled components – Shared with Irish Blood Transfusion Service (IBTS)Where a recalled blood component has been transfused, patient details (Name, DOB and hospital number) are provided by the Blood Transfusion laboratory to the IBTS as part of the IBTS Rapid Alert Notification process. • Replaced complaint procedure section with Feedback, complaints and compliments section • Addition of Advisory services section

	• Addition of Freedom of information section • Updated LIS manager to Lindsay Lindsey in contact details • Added Identification of patients and Phlebotomy instructions to Specimen collection section. • Laboratory supplies section: Removed reference to Pathology Paediatrics order form and Q-Pulse. • Specimens on ice section: added that specimens must be hand delivered directly to the laboratory. • Specimen acceptance policy section added: where a collection time is not provided and this impacts results, a default time of 00:01 for in-house and 09:00 for GP samples will be assumed. Processing will proceed based on this assigned collection time. • Section 20 added Electronic Cancer Report – Shared with National Cancer Registry Ireland (NCRI). NCRI collects, analyses, and disseminates comprehensive information on cancer in Ireland. These statistics and insights are used to inform research and cancer policy, enhance public health initiatives, and improve patient outcomes. Electronic Cancer Report is provided by Histology/Cytology Laboratory. Cervical Check Live Data - Shared with Cervical Check. Cervical Check live data sent via Interface HL7, enabling the automated transfer of laboratory results and screening data. The sharing of live data strengthens data management and reporting, supports robust quality assurance processes, facilitates the sharing of clear, transparent information and enhances the collection of real-time, high-quality data.
Biochemistry **Near Patient Testing**	Amendment to Scientifc staff detail Addition of detail for Critical alert values Addition of requirements for Trace metal testing • Reference to new blood gas analyser in medical offsite added • Added new ketone meters Added AQT 90 βhCG analyser
Blood Transfusion	• Added Rachel Gilmartin as Quality Officer. • Added Caitriona Gallagher as Deputy HVO

	• Added Aideen Creaton as Senior Medical Scientist • Removed specimen collection detail and referred to section in general. • Referred to general section for Policy on protection of personal information
Haematology	• Updated Wendy McGinty as Quality Officer • Added to Bone Marrow section that BM can be taken in EDTA or Li Hep bottles • Added critical alert value table
Microbiology/ Serology	Added to the Immunology Referral Tests, Sample Requirements and Refferal Laboratories Table : PATH-SER-FORM-18 to be used for Oxford Immunology Referral testing Section 22. List of Microbiology tests and their Sample requirements Removed reference to Glass Slides and Sellotape Test for Threadworms (Enterobius vermicularis) and replaced with moist swab testing.
Histology and Cytology	• Added email to staff contact details • Added to Histology/Cytology General Information. The request for urgent analysis must be used appropriately. Abuse of the urgent request facility will have an adverse effect on the turnaround times of genuinely urgent requests. For urgent requests indicate that the examination of the specimen is urgent by handwriting “urgent” on the Histopathology request form. Alternatively, contact the Histology laboratory to indicate the priority of the sample has changed to urgent. Ensure a contact number /bleep is on the Histopathology request form for verbal communication of the Consultant Histopathologist report. Such samples will receive priority reporting by the Consultant Histopathologist. Unexpected results are communicated to the requesting Consultant by the Consultant Histopathologist. For external users, please provide a contact number for phoning urgent results. • Added The department employs rigorous internal quality procedures to ensure a high level of quality is maintained. The Pathology Department participates in relevant available external third party assessment schemes. This includes schemes operated by: NEQAS (UK, National External Quality Assurance Scheme) NordiQC (Nordic Immunohistochemical Quality Control (NordiQC), College of American Pathology (CAP). • Added to Histology/Cytology Specimen Acceptance Criteria. Failure to provide the minimum data required on the Histopathology/Cytology Request form will result in a delay in

	processing the sample. The specimen type and anatomical site are particularly important in Histopathology where specimens may be multipart or left or right etc. Failure to submit essential information will result in a delay in specimen processing pending amendments being made to request forms or specimens. This may cause unnecessary delays in issuing reports. • Turnaround Times. Amended All large specimens to All large cancer specimens. Added all other non-cancer large specimens 80% in 15 working days. Amended all small specimens; biopsies from 80% 10 Working days to 80% 15 Working days, added excluding weekend clinics. • Mortuary Staff. Updated to Elaine Harrison Senior Anatomical Pathology Technician • Autopsy on still births and foetuses. Amended Histology Laboratory to Galway University Hospital Perinatal from the ward. • Updated Coroner to Mr. Fergal Kelly
Laboratory IT	• Updated LIS manager to Lindsey Lindsay

1. Table of Contents

2. Preface

This handbook has been prepared to inform the users of the HSE West and North West, Sligo University Hospital, Pathology Laboratory of which services are available and how to obtain the services required.

It is appreciated that with the ever increasing range of tests available it is difficult for the user to know which request form, specimen container, type of specimen and specific protocol required to obtain the specific investigation and result required. It is hoped that this handbook can address some of the problems encountered by clinical staff.

The handbook contains lists of relevant telephone numbers to facilitate access to appropriate consultants and senior scientific staff for advice; departmental telephone numbers are also available for result enquiries etc.

The views of users of this handbook and suggestions on how it may be improved are welcome; agreed changes in content and format etc. will be incorporated in future editions.

Liam O'Grady

Laboratory Manager

(On behalf of the Pathology Dept.)

3. Introduction

A comprehensive Pathology Laboratory Service is provided by the departments of Biochemistry, Haematology,Blood Transfusion, Histology/Cytology and Microbiology. Mortuary Services are also provided at the HSE West and North West - Sligo University Hospital.

The Pathology Department provides a service for Consultant In-patients and Out-Patients, for primary Care Practitioners and Kingsbridge Hospital. An "On-call" Service is provided outside routine working hours for urgent requests in Biochemistry, Haematology/Blood Transfusion and Microbiology.
The role of the Pathology Service can be summarised as follows:

- to provide a consultant-led advisory service supported by appropriate diagnostic facilities
- to provide analytical results with appropriate attention to quality, speed and economy
- to provide interpretation of results, and where necessary, advise on further investigation
- to monitor individual patients and provide laboratory control of therapy where necessary
- to collaborate in the development and implementation of new methods of diagnosis and treatment
- to undertake fundamental and/or applied research
- to participate in research projects generated in the hospital or community
- to collaborate in training and continuing education of staff in the hospital and community
- to offer support and quality control of new patient testing facilities

The Pathology Service is provided by a multi-disciplinary team of staff consisting of Consultant Pathologists, Medical Scientists, Medical Laboratory Assistants, Clerical, Secretarial and Portering Staff. All major disciplines of the Pathology Service are provided to hospital medical staff, GP Practices and other health care units within the region. Within the specified laboratory service limits, eligible healthcare practitioners within this laboratories service area and registered to practice in Ireland may access the services of this laboratory. The laboratory users are responsible for timely review of laboratory results and for acting on the result in a timely manner or bringing the result to the attention of a team member who can act on the result in a timely manner.
This handbook has been prepared to familiarize the user with departmental structure and policies as well as specific test requirements.

Laboratory policy statements include brief descriptions of each laboratory, key contact personnel, hours of operation and instruction regarding specimen collection and transportation to the laboratory.

Acute primary care interace meetings occur quarterly, which the laboratory manager and clinical director attends.

4. Location of the Laboratories

The Pathology laboratories are located on level 4.
The address of the laboratories is:
Pathology Department
Sligo University Hospital,
The Mall,
Sligo.
Eircode for Sligo University Hospital from the General Managers Office is F91 H684.

5. Car Parking

The nearest car park to the laboratory is just off the mall.
Car parking is “pay and display”.

6. Laboratory contact numbers			
Tel; 071917 ext			
Laboratory Manager – Liam O'Grady ext 74560			
Laboratory Reception office	74553	Reception Fax no.	36889
Clinical Biochemistry	**ext**	**Haematology**	**ext**
Oncall	173450	Oncall	173440
Chief Medical Scientist	74561	Haem Chief Medical Scientist	74562
Biochemistry Main Lab	74590	Haem lab Haem Quality Officer	74556 76928
Biochemistry Reception	74142	**Blood Transfusion**	
Serology	74159	Oncall	173440
Near Patient Testing	73444	BT Chief Medical Scientist Blood Transfusion lab	76881 74144 / 74719
		Haemovigilance	74675
		BT Quality Officer	74759
		Consultant Haematologist Dr Andy Hodgson	74458
		Consultant Haematologist Dr Aine Burke	36897
Histology/Cytology		**Microbiology**	
Main lab	74559	Medical Scientist On-Call	173444
		Main lab	74557
Chief Medical Scientist	74564	Molecular Suite	74166
Pathologist Secretary	74554/ 74710	Chief Medical Scientist office	74563
		Consultant Microbiologist Dr Ana Rueda Benito office	74162 087 3481265
		Consultant Microbiologist Dr Vlasta Zujic Atalic	74163 087 3531379
		Consultant Microbiologist's secretary	72501
Serology	74159	Quality Manager	74434
Public Health	74558	Surveillance Scientist- Karen Hickey	74140
Media	74157	**Laboratory IT**	
Infection Prevention and Control	74161	Lindsay Lindsey– LIS Manager Siobhan McHugh	74565 36824

7. Hours of operation

Biochemistry, Haematology, Blood Transfusion and Microbiology Routine Service Monday-Friday 08:00-20:00 hrs (excluding public holidays) Emergency On call service is available outside of these hours

To contact laboratory during routine hours, please refer to specific department for contact details.
To contact laboratory during On Call hours, contact relevant department as follows:

Biochemistry:	173450
Haematology/Blood Transfusion:	173440
Microbiology:	173444

Histology / Cytology / Serology / Public Health / Media /Infection Prevention and Control Department
Open 09:00 to 17:00hrs weekdays only. Please note that these departments are not open at weekends or Public Holidays and do not provide an “on call” service.

The Laboratory Central Reception has no office cover after 17:00 weekdays and ALL weekends, all queries must go through the On-Call telephones as above.

8. Test Availability

Tests Available during routine hours
For routine test availability and specimen requirements, please refer to specific departmental guidelines

Biochemistry
Haematology
Blood Transfusion
Histology/Cytology
Microbiology
Serology
Public Health

9. Provision of services to GPs

All General Practitioners (GPs)/practices accessing the laboratory services are required to complete and return the Laboratory service user registration form. It is a requirement to provide the laboratory with a contact number(s) that can be contacted 24 hours per day 7 days a week. This is required to allow the laboratory to alert a person able to take responsibility for care of the patient if sample analysis generates a potentially critical result including when these results are obtained outside normal practice hours.
Where the GP utilises an out of hours service e.g. Caredoc, it is the responsibility of the GP to have in place arrangements between the out of hours service and the GP to ensure that critical results can be communicated to

the GP and allow appropriate patient follow up. The Laboratory service user registration form can be obtained by request via email SUH.Pathology@hse.ie
The default method for communication of test results to GPs is via the HSE Healthlink electronic transmission system and therefore all GPs accessing the Pathology Laboratory service must be registered with Healthlink to receive laboratory reports prior to utilising the service. For information on Healthlink see www.healthlink.ie or contact support@healthlink@healthmail.ie

The Pathology laboratory reserves the right to restrict specialised and/or referral requests from GPs.

The laboratory provides results to the requestor (and whomever is listed as a 'copy to' on the request form if they are registered with the laboratory). Any requests for results outside of this should contact the requestor.

10. Oncall service

Medical Laboratory Scientists provide an emergency **On Call service** outside of the routine working hours for in - patients (see above for "on call" working arrangements). This service is intended to respond to urgent test requests and provide results, where there is an immediate clinical requirement for decision making in the patients' care.

Specimens during On Call hours should be sent on the red PATH-GEN-FRM-12 **Laboratory Emergency Request Form.** Any other tests required should be completed on blue/green request forms and attached. These non-On Call tests will be processed during next routine hours.

NB : All 3 copies of form must have patient information completed

Biochemistry Oncall

Biochemistry On Call tests (On Call Telephone number **173450**)	
Blood gases *	Total bilirubin (neonates only)
Urea & Electrolytes	Alcohol **
Cardiac enzymes (weekends only)	Paracetamol
Amylase	Salicylate
Magnesium	Glucose
Calcium	CRP
Troponin T Hs	Gentamicin 8 am-5pm Sat, Sun & BH
	Vancomycin 8am-5pm Sat, Sun & BH

*Biochemistry On call MUST be contacted prior to sending blood gas specimen. Failure to do so may result in specimen not being processed. Do not send blood gas specimens in chute system
** Alcohol requests from ED will only be processed upon direct discussion with the consultant. Result cannot be used for medico legal purposes due to collection procedure.
Tests other than those listed above will be separated and stored and processed during the next routine hours. However, in the event that specialized tests are required to be processed during Oncall hours e.g. Urine Organic Acids or any specimen that must be sent on ice, clinicians MUST contact Biochemistry On-Call to pre-arrange.

Haematology / Blood transfusion Oncall

Haematology / Blood transfusion On Call tests (On Call Telephone number **173440**)	
Group & Cross match*	Full Blood Count
Group & hold	Coagulation Screen
Antibody identification	D Dimers
Blood products*	Fib C

*On call scientist must be contacted to arrange
NB a blood transfusion request form must be completed for all Blood transfusion requests

Microbiology on call

Microbiology Tests available on call (On call Telephone number **173444)**	
Pre-midnight	**Post-midnight**
CSF analysis	CSF analysis
Corneal Scrapings	
Blood cultures.	Blood Cultures
Urines Culture / Microscopy	Urine (Paeds < 2 years of age only)
Sputum from ICU/ NICU.	
Pregnancy tests	
MRSA screens	
VRE screens	
Legionella & Pneumococcal Urinary Antigens	
SARS-CoV-2 / Flu / RSV - Rapid Test (8pm and midnight)	SARS-CoV-2 / Flu / RSV - Rapid Test (Consultant or Night Sister approved only)

The Microbiology Medical Scientist On-Call must be contacted prior to sending any urgent requests On Call. They are contactable using the numbers above or through the Main Switchboard .Other tests not listed here may be processed by request of the attending consultant physician and following discussion with the Medical Scientist on call.

There is no requirement to notify on call staff when sending blood cultures.

11. Turnaround times

Please note that the arrival area for specimens via chute/porter is a separate area to the Biochemistry, Haematology and Microbiology labs. Therefore, sending a specimen without notification to relevant Oncall staff may result in delay in specimen being processed and increased turnaround times.

Specimens between 2000 H and 2200H will be batched with a maximum turnaround time of 3hrs, please note that if specimen is required urgently during this time period, the OnCall staff must be notified and the specimen will be processed ASAP and in general with a maximum turnaround time of 1hr from receipt of specimen.
You are required to alert Oncall staff regarding all specimens after 2200H through to 0900H.
Oncall staff must be notified of all specimens from Resus to ensure specimens are processed immediately.

For routine test TAT's refer to individual laboratory departments.

Microbiology Turnaround Times

The Microbiology Laborarory stated turnaround times (TAT's) are from the day of receipt to issue of reports, in calendar days.

The times shown are the typical TAT's achieved by the laboratory, but may be longer or shorter depending on the availability of staff and the complexity of the investigation. SUH staff are committed to the fastest possible issue of reports, consistent with accuracy, on the specimens they examine.TAT's may vary during seasonal outbreaks, and testing may be conducted more frequently during epidemic seasons.

The Microbiology Laboratory seeks to process at least 75% of specimens received, within the published TAT's. This Quality Objective is reviewed each month using available data from the Laboratory Information System (LIS) for all accredited tests.

12. Laboratory Supplies

For SUH internal users, request forms and specimen containers are issued from the laboratory upon completion of supplies requisition form available from laboratory reception. External service users are required to source their request forms and specimen contaniners from Cruinn Diagnostics using PATH CR FRM 3 Supplies requisition for GP and Community Hospitals. This form is available from laboratory reception. GP orders received by 12pm will be delivered on the next working day

Laboratory reception	071 917 4553

Please allow 2-3 days from laboratory receipt of form to receive supplies.

13. Pathology request forms

Paper Request Forms

There are several types of request form in current use;

- **Blue Request** form used for routine blood sciences analysis
- **Red Request** form used for urgent on call analysis
- **Green Request** form used for Microbiology/Serology analysis
- **Purple Request** form used for Histology/Cytology analysis
- **For BloodTransfusion form details see separate BloodTransfusion section**

Request forms should be completed with appropriate legible clinical details. All request forms must be completed with the following information Please write legibly

- The patient's details (forename, surname, date of birth, sex, hospital number home address) on of request form
- Details of the originator of the request (doctor's name; also 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 collection date and time.
- The specimen type

Request form problems that will cause cancellation or delay in specimen processing

- Illegible patient demographics
- Absent or incorrect patient identifier

- Illegible name of requesting clinician
- Absent or incorrect time and date of request
- Incorrect ward/location
- Unclear or absent marking of test request boxes

High Risk Patients and Danger of Infection Specimens
All biological specimens are handled as though each specimen is a high-risk danger of infection specimen. However in known cases of high risk, please advise laboratory of risk on request form.

14. Specimen Transport

Transport of specimens to the laboratory must be done to minimise risk of infection to all those who come into contact with specimen. All specimens should be treated as potentially biohazardous and standard precautions should apply.

Histology/Cytology specimens must be delivered directly to the Histology/Cytology Laboratory. Pneumatic chute system is unsuitable.

Specimens must be transported in such a manner that:

- Patient confidentiality is maintained during transportation and on receipt of specimens.
- STAT and routine in house specimens are transported to the lab ASAP.
- GP or outside locations must be transported to the lab within 48 hours (72 hours for Serology specimens) or in accordance with criteria for time dependant analytes. Time dependant analytes for Biochemistry are highlighted in Purple in the Biochemistry section of this document.
- Specimens should be transported at ambient temperature ie between 5 °C and 30 °C and/or under conditions recommended for specific tests as per the relevant test guide (in this manual) in the appropriate specimen container.
- Specimens will be required to be packed and transported in accordance with the European Agreement concerning the International Carriage of Dangerous Goods by Road (UN ADR).

The laboratory will periodically evaluate the adequacy of sample transportation systems to verify ambient temperature conditions are met during transportation.

Internal transport of specimens
Specimens should be sent to the laboratory as soon as possible. Specimens must be placed within the specimen bag attached to the request form and sealed. Transport of specimens to laboratory from within hospital, is by use of portering service, Healthcare assistants or pneumatic tube system.
Many wards/departments in the hospital have a pneumatic tube system linked to all the departments. Each chute station displays the operating instructions and a problem guide. For all faults and general information ring the Maintenance department on 74555 or in an emergency bleep 180.

NB: Blood gas, CSF and Histology/Cytology specimens should NEVER be sent via pneumatic tube system as they will not be processed. Blood gas specimens must NOT be sent with needle still in place

Specimens on ice

If a specimen is required to be stored on ice, place ice into a specimen bag, place the specimen into another specimen bag, and place into the ice specimen bag. This ensures that the sample label is not damaged by ice water. Specimens on ice must be hand delivered directly to the laboratory immediately. Specimens on ice should NEVER be sent via pneumatic tube system.

Procedure for the Out of Hours Delivery and Storage of Specimens to Pathology

Urgent specimens may be sent by chute to 4551 or 4552 alternatively the specimen may be delivered to the scientist “on-call”. The person generating the request must contact the scientist “on-call.

External transport of specimens to the laboratory

Specimens may be hand delivered to laboratory central reception office without arrangement or via GP collections, during routine hours only Specimens should be sent to the laboratory as soon as possible (via the next transport courier on the same day of sample collection). Plan sample collection in line with transport options/courier schedule. Specimens should be delivered to the laboratory within routine working hours, Monday to Friday, excluding public holidays, 09:00-16:00 (15:00 on Fridays).
It is the responsibility of the external location to store specimens at the temperature conditions recommended for the specific sample and test, to prevent deterioration of the sample and assure accuracy of test results.
The laboratory would advise that samples should NOT be centrifuged off-site by external locations unless the practice utilises calibrated equipment in accordance with manufacturer's instructions and in line with criteria for the specific sample and test as detailed in this manual. Only serum separator tube samples may be centrifuged.
Where a centrifuge is utilised off-site, it is the responsibility of the practice to ensure

- The centrifuge is calibrated at a minimum annually by an accredited ISO 17025 supplier of the service
- Prior to centrifugation, samples should sit for 20-30 minutes at room temperature to allow for clotting and should ideally be kept upright.
- The speed and duration of centrifugation is compliant with the centrifugation criteria as provided in this manual for the relevant test (see relevant test table). Where centrifugation criteria are not provided, do not centrifuge the sample.
- The centrifuge is used and maintained as per its manufacturer’s guidelines
- Users are trained by the practice on the use of the centrifuge
- Records of above should be maintained and available for audit if required by SUH.

GP collections

A HSE GP transport service is available for transport of samples to the laboratory, for queries regarding this contact the Primary Care General Manager Sligo/Leitrim/Donegal or area as appropriate. Service users have been instructed on the transport requirements (PATH-BT-MEMO-13 Specimen Transport Requirements for Pathology Specimens) and by information contained in this manual.

Specimen transport and packing instructions

Diagnostic specimens which are to be transported by road to the laboratory should be packaged in accordance with the European Agreement concerning the International Carriage of Dangerous Goods by Road (**ADR**), UN 3373. It is the responsibility of the sender (consignor) to adequately package specimens for transport in accordance with these regulations. It is the responsibility of the consignor to ensure that transport containers are maintained in good condition, are cleaned regularly using detergent and disinfection in the event of a specimen spillage. It is the responsibility of the consignor to ensure that the container is appropriate for the purpose, is properly closed, and is not contaminated on the outside. Diagnostic specimens, which are assigned **UN 3373**, are human materials that are transported only for the purposes of diagnosis or investigation.

This following packing instruction applies to diagnostic specimens (UN 3373):

Summary of Requirements for UN 3373 Category B - Biological substances (liquids by road and sea)

Minimum 3 Layer Packaging System

Primary Packaging
- Leakproof

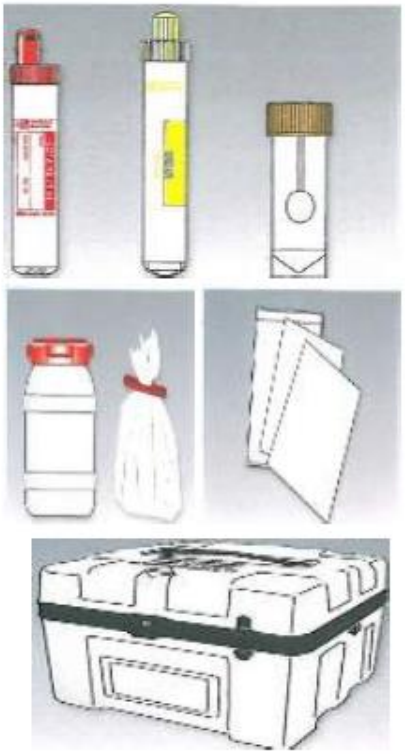
Secondary packaging
- Leakproof
- Contain absorbent material sufficient for all liquid present

Either primary or secondary packaging to withstand internal pressure of 95kPa

Outer Packaging
- Robust construction
- Minimum one surface dimension 100 x 100mm

Either secondary or outer packaging must be rigid

Completed package capable of withstanding a 1.2 m drop test



Example of Packaging systems

Outer packaging markings

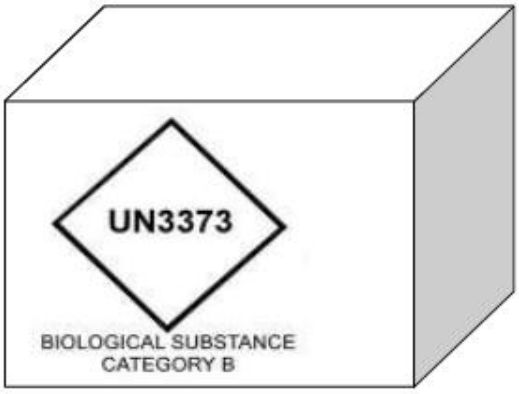
Packaging must

- Display **UN3373 Mark**

(Diamond minimum dimension 50 x 50 mm)

- Display the wording **'Biological Substances Category B'**

(Characters ≥ 6mm High)



Transport

No additional requirements for the carrier

Primary receptacles should be packed in secondary packagings in such a way that, under normal conditions of carriage, they cannot break, be punctured or leak their contents into the secondary packaging. Secondary packagings should be secured in outer packagings with suitable cushioning material. Any leakage of the contents shall not compromise the integrity of the cushioning material or of the outer packaging.

For further details of the packing instructions for UN 3373 refer to European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) part 4 packing instruction P650 and HSE National Guidelines or the Preparation for Transport of Patient Specimens and other Biological Materials 2023.

15. Patient consent

All procedures carried out on a patient need the informed consent of the patient. This should be obtained as per the 'HSE National Consent Policy', refer to HSE website. Patient consent for laboratory investigations is the responsibility of the requesting clinician.
For most routine procedures, consent can be inferred when the patient presents himself or herself with a request form and willingly submits to the collecting procedure e.g. venepuncture.
Special procedures, including more invasive procedures, or those with an increased risk of complications to the procedure may need a more detailed explanation and, in some cases, written consent.
In emergency situations, consent might not be possible; under these circumstances, it is acceptable to carry out the procedure for laboratory investifation, provided they are in the patient's best interest.
For some tests, specific consent forms are required, primarily genetic tests. Where consent forms are required to be completed, this is stated in the departmental user manual requirements for the test.

16. Specimen Collection

A failure to undertake a formal identity check with the patient at the time of sample collection places the patient at risk and breaches professional standards and guidelines.

Identification of patients

- The person taking the specimen should ask the patient to state their full name and date of birth e.g. patient should be asked 'what is your name' not, are you Mr/Mrs Murphy?'
- Where the patient is admitted in SUH, their identification band should record their full name, date of birth and unique hospital number and must correspond to that given by the patient. Where a patient is unable to identify themselves e.g. unconscious, young children etc, patients case notes should be used as an additional check to the identification band.

- The specimen should be labeled at the time of sampling and the information given by the patient must correlate with that which is used to complete the specimen and request form.

Phlebotomy instructions

- Medical doctors, registered nurses/midwives who have had appropriate training can carry out venepuncture.
- It is the responsibility of the person who is taking the specimen to ensure that the specimen collection tube is within its expiry date.

Phlebotomy/equipment

- Appropriate number of suitable specimen collection tubes. Ensure that these are within expiry date.
- Evacuated tubes within expiry date (discard tube if necessary) and safety needle system.
- Clean disposable tourniquet.
- 2% Chlorhexidine & 70% Isopropyl Alcohol swab.
- Gloves
- Gauze
- Waterproof plaster

Cleansing the site

Step 1 Cleanse the site for a minimum of 30 seconds using a "friction scrub" technique applying sufficient pressure to amalgamate surface flora with 2% Chlorhexidine & 70% Isopropyl Alcohol swab.
If the patients arm requires excessive cleansing, then repeat the process with several alcohol swabs.
Step 2 Allow the area to air dry naturally for a minimum of 30 seconds.

Performing the phlebotomy puncture

Apply tourniquet
Vacutainer tube holder method:
Step 1 Have the first tube, stopper-end first, ready to place into the tube holder without advancing it onto the interior needle.
Step 2 Remove the sheath from the needle.
Step 3 Grasp the holder with the fingertips, placing the thumb on top and two or three fingers underneath.
Step 4 Rest the back of the fingers firmly on the patients forearm so that the bevel of the needle faces up and lies just off the skin at the intended puncture site.
Step 5 Inform the patient of the imminent puncture. Note: Do not assume that the patient is prepared for the puncture. A verbal warning should be given, even if the patient appears unconscious or sedated.
Step 6 Anchor the vein. Using the thumb of the free hand, stretch the skin by pulling downward on the arm from below the intended puncture site.
Step 7 Guide the needle into the skin and vein with a steady, forward motion at an angle of 15 degrees or less.
Step 8 Advance the collection tube fully forward so that the interior needle punctures the stopper of the tube, using the flanges of the tube holder. Keep the needle assembly as stable as possible in the vein.
Step 9 Loosen the tourniquet with the free hand once blood begins to flow. If blood is not obtained, then the tube may have lost its vacuum or the needle may be improperly positioned in the vein or the vein may be too small for the needle gauge used or a vacuum-assisted draw.
Step 10 Allow the tube to fill fully to its stated capacity.
Step 11 Remove the filled tube from the tube holder, ensuring the needle is not pulled out of the vein when the stopper is unseated from the interior needle.
Step 12 Gently invert the tube that contains an additive 5-10 times. If more tubes are required, then apply, fill, remove and mix tubes, following the proper order of draw, see below.
Step 13 Instruct the patient not to clench his/her fist.
Step 14 Release the tourniquet, if still applied.
Step 15 Lay a gauze pad lightly on the insertion point without applying pressure.
Step 16 Withdraw the needle completely, immediately activating the devices safety feature according to manufacturer's instructions.
Step 17 Apply pressure to the puncture site.
Step 18 Discard the activated device in a sharps containers without disassembling from the tube holder.

Order of draw

To prevent additive carryover, follow order of draw when collecting multiple specimens during a single venepuncture:

1. Sterile tubes or bottles for blood cultures
2. Sodium citrate tube for coagulation studies (e.g. light blue closure)
3. Serum tube with or without clot activator; with or without gel separator (e.g. red-, gold-, speckled closure)
4. Heparin tube with or without gel separator (e.g. green closure)
5. EDTA tube with or without gel separator (e.g. lavender closure/pink closure)
6. Glycolytic inhibitor tube (e.g. grey closure)

Post puncture care

Step 1 Apply firm pressure to the puncture site using a clean gauze pad until bleeding has stopped. Note: Bending the patients arm up is not an adequate substitute for pressure and prevents observation of bleeding or haematoma formation.
If the patient offers to apply pressure, then co-operative patients may be allowed to assist.
Step 2 Lift the gauze and observe the puncture site for 5 to 10 seconds for superficial bleeding and mounding or rising of the surrounding tissue.
If bleeding has not ceased, then re-apply pressure for 1 to 2 minutes and re-examine site, repeat the process until bleeding has stopped.
If a hematoma develops, then apply direct pressure for 1 to 2 minutes and re-examine site, repeat the process until bleeding has stopped. Maintain pressure dressing and frequent observation of the site. Verify coagulation status and seek medical help if necessary.
If bleeding persists longer than 5 minutes, then maintain direct pressure on site and re-examine site. Verify coagulation status and seek medical help if necessary.
Step 3 Bandage the puncture site, once bleeding has stopped.
Step 4 Instruct the patient to leave the bandage in place for at least 15 minutes.

Safe disposal of materials

Ensure any contaminated sharps are disposed as described above in a contaminated sharps container; also ensure that any contaminated gauze pads are disposed in a contaminated waste container.

Volume	Order of Draw	Cap Colour	Additive	Assays	Mixing Instructions	Special Instructions
8-10 ml (adult) 0.5-5 ml (paeds)	1	 Adult:Aerobic  Adult: Anaerobic  Paeds Bottle		Blood culture/fluid culture	Mix gently by swirling bottles	Wash and dry hands thoroughly. **DO NOT COVER THE BOTTLE BARCODE. THIS IS FOR LAB USE.** For optimum sensitivity, **2 sets of blood cultures** should be collected from separate sites at least ≥ 6 hours apart, or if the patient is extremely ill 20-30 minutes apart.
3ml	2		Citrate Solution	PT, APTT, D-Dimer, Fibrinogen, Thrombophillia Screen,	After Blood Collection, Invert tube 4 times	Fill tube to Arrow Line - Inadequately filled tubes CANNOT be used, including overfilled tubes.
9ml	3		Serum Gel	General Biochemistry Tests, Immunology & Virology Tests,	After Blood Collection, Invert tube 5-10 times	Allow 30 Minutes before Centrifuging
6ml	4	 Red	Serum clot activator Gel Free	Biochemistry tests: certain drug level	After Blood Collection, Invert tube 5-6 times	Take ONLY when specifically requested
9ml	5		Lithium Heparin Gel	Biochemistry tests; if specimen is clotting in-vitro, some non-routine Biochemistry tests e.g. Amino Acids	After Blood Collection, Invert tube 5-10 times	Allow 30 Minutes before Centrifuging
4ml	6	 Green	Lithium Heparin Gel Free	Biochemistry test: Chromosome analysis	After Blood Collection, Invert tube 8-10 times	Take ONLY when specifically requested
3ml	7		EDTA	FBC, HBA1c, Malaria Parasites, Sickledex, Reticulocyte Count, Aldosterone , Renin, Cyclosporins, Haemochromatosis, Ammonia, ESR, PTH, PCR	After Blood Collection, Invert tube 8-10 times	Ammonia MUST be Transported on ICE PTH must be sent promptly to the lab
6ml	8		EDTA	Group& hold, Crossmatch, DCT	After Blood Collection, Invert tube 8-10 times	PDA label or Handwritten details ONLY
4ml	9		Fluoride Oxalate	Blood Glucose Levels & GTT, Lactate	After Blood Collection, Invert tube 5-10 times	Specify Collection Time & State if sample is RANDOM or FASTING,Lactate to be transported on Ice
6ml	10	 Royal Blue	Serum clot activator, Metal free	Trace Metal Analysis	After Blood Collection, Invert tube 8-10 times	Take ONLY when specifically requested

Table 1 Sample Collection Tubes & Order of Draw

Specimen containers and request forms should be labelled at the time of collection. Pre-labelling of blood collection tubes is poor practice and increases risks of misidentification.

If using an addressograph/adhesive label on a specimen it must be no bigger than that of the label already on the container and should be placed horizontally and only over the existing label.

Separate Blood samples are required for each of the Laboratory disciplines (e.g. if a clotted blood sample is required for Serology and Biochemistry tests, then two clotted blood samples should be sent). Ensure the correct numbers of samples are sent for the tests requested. One full clotted specimen is adequate for all routine biochemistry and endocrinology testing.

Contamination, interfering factors and specimen storage

!!! AVOID CONTAMINATION !!!

When taking a series of blood specimens, it essential that the **order of draw** outlined in the table above is followed. Failure to adhere to this sequence will lead to contamination of blood specimens with anticoagulants /preservatives. This contamination can produces spurious and invalid results in major biochemical parameters.

- Always draw Blood Cultures first to reduce contamination of the bottles.
- Avoid haemolysis, drip contamination, over-heating and prolonged venous constriction.
- Ensure thorough and instant mixing of blood with anticoagulant (heparin, fluoride EDTA or potassium EDTA) for plasma specimens.
- Do not transfer blood from one tube to another e.g. EDTA to Lithium heparin.
- Do not leave Clinical Biochemistry blood specimens in the fridge (4°C) or overnight at room temperature without prior centrifugation if required.

17. Specimen Acceptance Policy:

The following does not apply to Blood Transfusion or Histology/Cytology; please refer to Blood Transfusion and Histology/Cytology sections.

For test specific requirements, refer to specific laboratory department sections.

Mandatory criteria for specimen labeling
• Patient surname & forename (do not use abbreviations)
• SUH PID (where available for GP samples)
• Date of birth
• Date of collection *Multiple specimens taken at different times on a patient MUST be labeled on the specimen container with the time (24 hr clock) when the specimen is taken. The request form should also be labeled accordingly
• For babies of multiple births: twin/triplet etc number
• In exceptional circumstances e.g. SUH patients in a major incident or unknown unconscious ED patient: Unique identification number, name e.g. Jane Doe and gender.
• Details must be legible

Mandatory criteria for request form completion
• Patient surname & forename(do not use abbreviations)
• SUH PID (where available for GP requests)
• Date of birth
• Date & time (24 hr clock) of collection (Omission of collection time renders samples unsutiable for some tests, see test profiles)
• For babies of multiple births: twin/triplet etc number
• In exceptional circumstances e.g. SUH patients in a major incident or unknown unconscious ED patient: Unique identification number, name e.g. Jane Doe and gender.
• Relevant Clinical Details
• Location and Doctor
• Test(s) requested
• Details must be legible

The patient details must be correct and correspond on specimen and request form.

Additional labeling information

- Please provide Professional Registration number
- All sheets of the request form should be labeled with an addressograph.
- Some genetic/specialised tests require an additional completed consent form and may not be processed without it, refer to specific laboratory department sections.
- Specimen and form may be handwritten or addressograph labeled or use Blood Track PDA label.
- Where a collection time is not provided and this impacts results, a default time of 00:01 for in-house and 09:00 for GP samples will be assumed. Processing will proceed based on this assigned collection time.

Please Use the appropriate request form:

-**Blue Request form** used for routine Blood sciences analysis (Biochemistry/Haematology/Serology)

-**Red Request form** used for urgent on call analysis (Biochemistry/Haematology/Microbiology)

-**Red Blood Transfusion request form** (Blood Transfusion)

-**Green Request form** used for Microbiology analysis and chlamydia testing for Serology (Microbiology/ Serology)

-**Purple Request form** used for Histology/Cytology analysis

Actions if mandatory requirements not met
If any mandatory criteria are omitted or incorrect on specimen &/or request form or differ between specimen and request form, the specimen will not be analysed, will be rejected and this will be reported on the LIS.

Aged (>48hrs) samples and illegible writing on request forms or samples will NOT be processed.

Deviation from Specimen Acceptance Policy:
If a Doctor/Advanced Nurse Practitioner (ANP) requires a rejected request (from below list of exceptions) to be processed due to the specimen **being irreproducible**, they must attend the Pathology laboratory and in conjunction with a medical scientist complete a PATH-LAB-QR-30 Sample acceptance deviation record. The Dr/ANP will state the reason for the error, confirm they are **unable to obtain** repeat specimens and accept responsibility for any clinical decisions made on the basis of the results.

The Pathology Department will accept no responsibility for specimens analysed which initially failed to meet the acceptance criteria.

Approved list of exceptions:
- Paediatric specimens <7 yrs of age (not Microbiology specimens)
- Dynamic function test specimens (TRH, Synacthen)
- Specimens collected in an acute situation where the clinical status of the patient may have changed e.g. drug overdose, hypoglycaemic episode, commencing anti-coagulant therapy, mast cell tryptase, complete loss of venous access such as severe burns.
- Bone marrow, CSF specimens, tissues and other fluids obtained by invasive procedures (NOT blood specimens).
- Specimens for culture from normally sterile sites where antibiotic therapy has been subsequently started e.g. blood cultures
- All histology and cytology specimens

Please note in general that specimens of Blood would not normally be classified as 'Unrepeatable'.

General Practitioner requests for changes to patient demographics

Where a GP requires a patient's forename, surname, DOB or gender to be amended on the Laboratory Information System (LIS), they must provide written confirmation.
This must be on GP headed paper which includes:

- Patient's current forename, surname, DOB, gender, address,
- the change required
- The GPs signature (include PID if available).
-

This should be provided with the specimen as required.

If not, and the patient demographics on the request do not match those on the LIS, the specimen will not be processed and will be reported as rejected on the LIS. Specimens will be stored for 48hrs and processed if testing is feasible upon receipt of the confirmation.

NB: General Practitioners; Where Pathology reports are returned to GP practice with Sligo University Hospital PID quoted, please update patient records and use PID on future requests

18. Laboratory reference ranges

Reference ranges are age and sex related as appropriate and are provided on the test report. Note all ranges quoted on laboratory reports for females are for non-pregnant females.
If the patient is pregnant, many laboratory parameters will have different reference ranges to those for non-pregnant females. In addition, different ranges apply at different stages of the pregnancy.
Clinicians must note that the interpretation of laboratory test results in pregnant patients should be based on the circumstances and gestational age, rather than on the stated reference ranges for non-pregnant females. Please see https://perinatology.com/Reference/Reference%20Ranges/Reference%20for%20Serum.htm#C or contact the relevant laboratory department for further information.

19. Policy on protection of personal information

Arrangements are in place to ensure that confidentiality of personal information is maintained. Each member of staff is contractually bound not to discuss or disclose any information of a confidential nature except in the proper course of their employment, COR-CE-002 Sligo General Hospital Confidentiality Code of Practice.

20. Policy on Sharing Patient Data with External Bodies

Notifiable Diseases – Shared with Department of Public Health

All medical practitioners, including clinical directors of diagnostic laboratories, are required by law to notify the Medical Officer of Health (MOH)/Director of Public Health (DPH) of certain diseases.

This information is used to investigate cases thus preventing spread of infection and further cases. The information will also facilitate the early identification of outbreaks.

It is also used to monitor the burden and changing levels of diseases, which can provide the evidence for public health interventions such as immunisation.

The list of diseases (and their respective causative pathogens) that are notifiable is contained in the Infectious Diseases Regulations 1981 and subsequent amendments.

There is a requirement to give "immediate preliminary notification" to a Medical Officer of Health for twenty-three notifiable infectious diseases on the notifiable disease list that have a potential to cause a serious threat to public health. Notifications to the Medical Officer of Health (MOH)/Director of Public Health (DPH) are made by Surveillance Scientist (Microbiology) using the **Computerised Infectious Disease Reporting (CIDR)** national information system and include patient identifiers (name, hospital number, date of birth, address) in addition to the relevant notifiable disease.

The list of notifiable diseases is available at:

https://www.hpsc.ie/notifiablediseases/listofnotifiablediseases/

Epidemiological Reports – Shared with HPSC

In addition to the notification of certain diseases to the Medical Officer of Health (MOH)/Director of Public Health (DPH) outlined above, regular epidemiological reports are submitted to the **Health Protection Surveillance Centre (HPSC)** by Surveillance Scientist.

The HPSC is part of the Health Service Executive and works in partnership with health service providers and sister Organisations in Ireland and around the world, to provide the best possible information for the control and prevention of infectious diseases. HPSC strives to protect and improve the health of the Irish population by providing timely information and independent advice, and by carrying out disease surveillance, epidemiological investigation and related research and training. Reports include patient identifiers (hospital number and date of birth, but not name or address).

Hospital Acquired Infections – Shared with National Incident Management System (NIMS)

Instances of hospital-acquired Staphylococcus aureus infection and hospital-associated new Clostridium difficile infection (CDI) are reported on the National Incident Management System (NIMS).
NIMS is a web-based system for capturing, managing and analysing patient safety incidents and claims in Ireland. The system also supports reviews into incidents, the monitoring of recommendations and records complaints.
Reporting of incidents includes patient identifiers (name, hospital number, date of birth).

Transfusion recalled components – Shared with Irish Blood Transfusion Service (IBTS)

Where a recalled blood component has been transfused, patient details (Name, DOB and hospital number) are provided by the Blood Transfusion laboratory to the IBTS as part of the IBTS Rapid Alert Notification process.

Electronic Cancer Report – Shared with National Cancer Registry Ireland (NCRI)

NCRI collects, analyses, and disseminates comprehensive information on cancer in Ireland. These statistics and insights are used to inform research and cancer policy, enhance public health initiatives, and improve patient outcomes. Electronic Cancer Report is provided by Histology/Cytology Laboratory.

Cervical Check Live Data - Shared with Cervical Check

Cervical Check live data sent via Interface HL7, enabling the automated transfer of laboratory results and screening data. The sharing of live data strengthens data management and reporting, supports robust quality assurance processes, facilitates the sharing of clear, transparent information and enhances the collection of real-time, high-quality data.

21. Open Disclosure

In line with HSE Open disclosure policy, the laboratory will communicate with patients, users and other relevant persons in an open, honest, timely and transparent manner when laboratory incidents resulted or could have resulted in patient harm. This will be done via the relevant department Consultant and/or the Hospital Quality and Patient Safety department.

22. Feedback, complaints and compliments procedure

The goal of the laboratory is to ensure that our users receive accurate, reliable, meaningful and timely laboratory results.
The laboratory welcomes all feedback particularly in relation to the selection of examination methods and interpretation of examination results.
It is your right as a service user of the HSE to make a complaint if you believe that standards of care, treatment or practice fall short of what is acceptable.

Any individual who wishes to make a complaint, compliment or provide feedback can contact the relevant departmental Chief Medical Scientist or the Laboratory Manager and request that their complaint/compliment be documented (refer to laboratory contact details section).
For all substantive complaints the laboratory ensures that those areas of activity and responsibility involved are promptly investigated. Records of all complaints including appropriate investigations, corrective action and follow-up actions taken by the laboratory are reviewed and maintained electronically in the laboratories quality management system. Wherever possible the laboratory will acknowledge receipt of the complaint and provide the complainant with the outcome.

Alternatively, patients can provide complaints or feedback via the HSE Your Service Your Say at https://www2.hse.ie/complaints-feedback/ or by contacting Hospital Consumer Services or by contacting the SUH Patient Advice and Liaison Service (PALS) Coordinator via SUH switchboard. Patient feedback that is relevant to the Pathology Laboratory is communicated to Laboratory management via these services.

If a complaint cannot be resolved at local level the complainant is advised of their right to review by the Hospital Consumer Services.

The laboratory is committed by use of surveys or otherwise to establishing a method of measuring customer satisfaction. Improvements to the service as a result of customer satisfaction surveys are recorded and maintained by the laboratories quality management system.

23. Advisory services

Departmental Consultants provide clinical advisory services and scientific staff provide scientific advisory services to users and are contactable as per departmental contact details. Exception: No Chemical Pathologist is available for Biochemistry department. Consultant Haematologists do provide advisory services for Haematinics. Requesting appropriate tests, subsequent application of test results and interpretative guidance from the appropriate laboratory department must be applied to patient care by the patient's clinician in the overall context of the patient concerned. For this reason, clinical advisory services are only accessible to medical practitioners or other healthcare professionals acting on the recommendation of a medical practitioner.

24. Freedom of information

The laboratory provides results to the requestor. Where a patient wishes to obtain information related to their laboratory results, they can contact their requesting Doctor for same. Alternatively, the patient can contact the Sligo Hospital consumer services department and request the information via a Freedom of Information request. The consumer services department will process Freedom of Information requests, access the LIS and provide the relevant laboratory results to the requester in line with Freedom of Information and Data protection legislation. The laboratory will assist the Sligo Hospital consumer services department with Freedom of Information requests when required.

25. Biochemistry Laboratory

Biochemistry Laboratory
Pathology Department,
Sligo University Hospital,
Sligo.

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Introduction

The function of the Clinical Chemistry laboratory is to perform qualitative and quantitative analyses on body fluids such as blood, urine, spinal fluid as well as other fluids. This is a guide to the Biochemistry laboratory in Sligo University Hospital and it aims to detail sample requirements for the repertoire of tests that are performed in the department and to summarise requirements for those that are sent out to referral laboratories.

Biochemistry Hours of Operation

Hours of Operation:	Routine Service Monday-Friday 0800-2000 Emergency On call service available outside of these hours

Biochemistry Laboratory Staff Contact Details

The telephone in Biochemistry will be answered daily between 11:30 – 13:00h and between 14:00-1530h. Patient reports are available on the LIS for look up as soon as they are authorised.
Details of specimen requirements are listed in the sections below.

Name	Job title	Contact / Email
Mr Liam O'Grady	Laboratory Manager	Liam.OGrady@hse.ie 071 917 4560
Ms. Noreen Montgomery	Chief Medical Scientist	Noreen.Montgomery@hse.ie 071 917 4561
Ms Louise Molloy	Specialist Medical Scientist	Louise.Molloy1@hse.ie Ext 73444
Ms Karen Connolly	Senior Medical Scientist	KarenA.Connolly@hse.ie 071 917 4590
Ms Sarah Daly	Senior Medical Scientist	Sarah.Daly6@hse.ie 071 917 4590
Ms Martina Egan	Senior Medical Scientist	Martina.Egan2@hse.ie 071 917 4590
Laboratory Phone Numbers	On call	173450

	Biochemistry Reception	071 917 4142
	Main Laboratory	071 917 4590

Biochemistry Blood Sample tube guidelines

The sample tubes that are predominantly used in Biochemistry are as follows;

Vacuette Serum Tube

The inner wall of the VACUETTE® Serum tubes have a special coating of microscopic silica particles to activate the coagulation process. Serum gel tubes contain an inert barrier gel that is present in the bottom of the tube. During centrifugation the barrier gel moves upward to the serum - clot interface, where it forms a stable barrier separating the serum from fibrin and cells. VACUETTE® Serum Tubes with Gel improve the serum yield and enable serum to be left in the primary tube.

Serum Gel free Tubes
The serum tubes without gel are needed for checking the levels of many therapeutic drugs. Please contact the laboratory for further guidance

Vacuette Lithium Heparin Tube

The inner wall of the VACUETTE® Heparin tubes is coated with spray-dried lithium, ammonium or sodium heparin. The additives are anticoagulants, which block the coagulation cascade and prevent coagulation of the blood sample.
Plasma gel tubes contain an inert barrier gel that is present in the bottom of the tube. During centrifugation the barrier gel moves upward to the plasma - cell interface, where it forms a stable barrier separating the plasma from cells. VACUETTE® Plasma Tubes with Gel improve the plasma yield and enable plasma to be left in the primary tube.

Lithium Heparin Gel free tubes
Use the gel-free lithium heparin tubes for Chromosome and Genetic studies.

Vacuette Flouride Oxalate Tube



Both sodium fluoride and iodoacetate are used in VACUETTE® Glucose Tubes as glycolysis inhibitors to preserve glucose when combined with an anticoagulant such as EDTA, potassium oxalate or heparin. The tubes are suitable for determining glucose and lactate. The latter must be collected on ice.

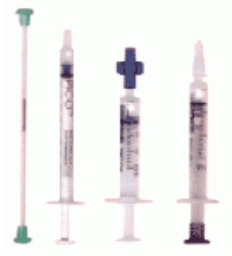
Vacuette EDTA Tube


The tube interior of EDTA tubes is spray dried with EDTA. (EDTA – a salt of ethylene diamine tetraacetic acid). EDTA tubes are offered as either K2EDTA or K3EDTA tubes.

EDTA Aprotinin Tubes

The 4ml **EDTA Aprotinin** (Pink capped) tube is required for certain tests referred to External laboratories.These include, but are not exclusive to, ACTH, ADH, Glucagon, PTH-Related peptide, Somatostatin, etc.This tube is available from the Biochemistry laboratory. Please contact the Biochemistry Laboratory for further guidance.

Blood gas syringes



Unique dry, electrolyte-balanced heparin prevents bias and analyzer clotting

Receipt of Specimens

Ideally all specimens should be received as soon as possible following phlebotomy. For in-house samples the most efficient delivery to the laboratory is via the chute. Certain sample types however cannot be transported via the pneumatic chute system as outlined in the departmental specimen acceptance policy. The samples that

should **not** be sent via chute are Blood Gases and any sample on ice requiring immediate processing e.g. Lactate and Ammonia. All samples for Biochemistry must be received within 48hrs of phlebotomy in line with departmental specimen acceptance criteria. A restricted testing profile can only be provided when specimens are aged.

Sample Processing, Results and Turn-Around-Times (TAT's)

Every effort is made to ensure that samples are processed in a timely manner with results available to the requesting clinicians within stated TAT's.

STAT specimens: Results available within a 1 hour target
Routine SUH in patient specimens: Results available within a 4 hour target.
GP specimens: Results available within 48 hours of receipt into the laboratory during routine working hours.

The relevant department should always be contacted in advance if results from primary care locations are required urgently.

Retrospective Requesting (add-on requests)

It may be possible to retrospectively request additional testing on a sample already in the possession of the laboratory when this would facilitate efficient clinical management. However, this depends on the integrity of the sample in our possession, its suitability for the additional test and current workload levels being experienced. Results may take up to 12hr to report. If urgent results are required it is always preferable to take a fresh sample. Add-on testing remains at the discretion of the laboratory because of the additional risk and work it involves and we would appeal to users not to abuse this aspect of our service.
In general tests can be added up to 24 hours post collection, after 24 hours it is preferable to collect another sample. Some tests are not suitable for add-on requesting e.g. Alcohol, Ammonia, CO_2 (Bicarbonate), Glucose, HbA1c, Lactate, PTH

Telephoning of Results

The department strives to phone back critical test results as soon as possible following report authorisation, in line with departmental policy and in conjunction with guidance issued nationally from the Royal College of Pathologists. Once a report is authorized, it is available to view at ward level and is downloaded to primary care locations via Healthlink. Refer to the table below for outline of critical alert values.

Biochemistry Critical Alert values

Test name	**Critical lower limit**	**Critical upper limit**	**Units**	**Urgency** (Guidelines only)	**Comments**
Sodium	≤ 120 ≤ 130 if <16yrs	≥155	mmol/L	A	
Potassium	≤ 2.5	≥6.0 **≥6.5***	mmol/L	A	***For all DIALYSIS (RDU) patients only**
Glucose	≤ 2.5	≥25.0 ≥15.0 if <16 yrs	mmol/L	A	
Urea		≥30.0* ≥10.0 if <16y	mmol/L	A	*New or if > 50% increase in 48hr in Non dialysis patients
Urea ((Pregnant patients only)		>5.0 *	mmol/L	A	*Results >5.0 for pregnant patients must be communicated as per PATH-GEN-POL-28
Creatinine		≥354 * ≥200 if <16y	umol/L	A	*New or if > 50% increase in 48hr in Non dialysis patients
eGFR	≤15*		ml/min/ 1.73sq.m	A	*New presentation
Bicarbonate	≤ 10.0		mmol/L	A	
Calcium (Adj)	≤1.80	≥3.00	mmol/L	A	
Magnesium	≤ 0.40		mmol/L	A	

Phosphate	≤ 0.3 * >0.3 – ≤ 0.45 **			A * B **	* Requires immediate communication ** Requires communication within 24 hours if GP/GP OOH's, preferably same working day
Troponin		≥ 14 if GP/OPD Patient/ non in house location ≥ 50 for all in house locations *		A	*1st presentation
Creatinine Kinase		≥5000 ≥500 1st occurrence	U/L	A	
Uric Acid		≥ 0.34 * (Ante natal indications only)	mmol/L	A	*Results> 0.50 for pregnant patients must be communicated as per PATH-GEN-POL-28
LDH (Pregnant patients only)		>450 * (>550 for 3rd Trimester)		A	*For pregnant patients only; results > 450 (and >550) must be communicated as per PATH-GEN-POL-28
Amylase		≥ 500 (≥ULN x 5)	U/L	A	ULN:Upper Limit of Normal
Total Bilirubin		≥ 200 *	umol/L	A	*Neonates only
Direct (Conj.) Bilirubin		≥ 25 *	umol/L	A	*Neonates only
ALT		≥ ULN x 15	U/L	A	ULN:Upper Limit of Normal
AST		≥ ULN x 15	IU/L	A	ULN:Upper Limit of Normal

AST (Pregnant patients only)		>50 *	IU/L	A	*For pregnant patients only; results > 50 must be communicated as per PATH-GEN-POL-28
Lactate		≥ 5.0	mmol/L	A	
Ammonia		≥ 100	umol/L	A	
Alcohol		≥ 400 (or any detectable level in <16yrs)		A	
Carbamazepine		≥ 25 *		B	*Requires communication within 24 hours
Digoxin		≥2.5	nmol/L	A	
Lithium		≥1.5 ≥ 1.0 for MHS patients	mmol/L	A	MHS = Mental health Services incl. COLO
Paracetamol		Any detectable level		A	
Phenytoin		≥ 25 *		A	*Requires communication within 24 hours
Salicylate		≥ 300		A	
Free T4		≥50.0	pmol/L	C	If new presentation
Osmolality (Serum)	<250	> 320	mOsm/ Kg	A	
Cortisol	≤ 50 * ≤ 250 ** (SST 30min)			A	*Unless part of dexamethasone suppression test ** As part of SST(Short Synacthen Test)
CRP		≥300		A	
TRIGS		≥ 20		B	
Vitamin B12	≤ 150			B	
Hypogamma-globulinaemia	IgG < 3.0*			C	*With low IgA and IgM

Paraprotein		IgD Any IgE Any IgG >15 IgA >10 IgM >!0	g/L	C	First Time detection
Gentamicin		>5.0	mg/L	A	
Vancomycin		>20.0	mg/L	A	

Near Patient Testing (NPT)

NPT refers to tests performed by non-laboratory staff near to the patient rather than in the clinical laboratory. The rapidity of obtaining a result can contribute to improved outcomes for patients. It is essential that all NPT is conducted within a framework of quality standards in compliance with National Guidelines.

Access to service training

Training and competency assessment is required for access to all NPT equipment under the governance of the NPT manager. Training for some NPT analysers is undertaken at staff induction. This includes the blood gas analysers, glucometers, ketone meters & the Beta Hcg analyser training. Some ward staff are trained by the near patient testing team as cascade trainers. These trainers can train staff in their own working area. To schedule training please contact Near Patient Testing Manager by email at;

louise.molloy1@hse.ie Ext 73444

It is mandatory to enter patient's demographics on ALL NPT devices. Any demographics entered incorrectly should be reported immediately to the NPT department or the Biochemistry department outside hours.
Only staff who are fully trained have access to the analysers through their own unique password.

DO NOT share your log on with any other staff.

6.1 Blood Gas Analysis

There are 14 blood gas analysers spread across the Sligo University Hospital campus.These are listed in the table below.

LOCATION	LEVEL	NUMBER OF ANALYSERS
Acute Assessment Unit	3	1
Emergency Department	3	3
Delivery Ward	4	1
Near Patient Testing Laboratory	4	1
Medical South	5	1
Day Services Theatre	6	1
Paediatric ward	7	1
Intensive Care Unit	8	2
Post-Anaesthesia Care Unit	8	1
Benbulbin Respiratory Hub	Off-site	1
Medical offsite ward (St Johns)	Off-site	1

Blood gases should be collected in approved heparinised syringes and processed immediately, ideally

within 10 minutes of collection.

6.2 Glucometry

There are 60 Roche Inform II glucose meters located throughout the hospital used for patient monitoring. These quantitatively measure glucose (sugar) in venous whole blood, arterial whole blood, neonatal heel stick, or fresh capillary whole blood samples drawn from the fingertip as an aid in monitoring the effectiveness of glucose control.

6.3 HbA1c Analysis

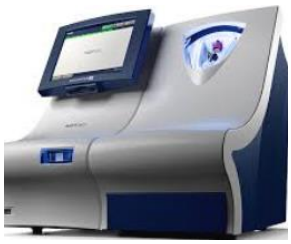
The Siemens DCA vantage analyser is located in the Diabetes Centre at SUH and is used to measure HbA1c from a small (1 µL) whole blood sample in 6 minutes

6.4 Ketone Meters

There are 36 Apex Bio Ketosure meters located throughout the hospital and at our 2 off site locations- the benbulben hub and medical ward in St Johns hospital. These quantitatively measure ketones in
venous whole blood, arterial whole blood, neonatal heel stick, or fresh capillary whole blood samples dra wn from the fingertip as an aid for managing Type 1 diabetes and avoiding life-threatening diabetic ketoacidosis (DKA).

6.5 Beta Hcg (βhCG) Analysis

The Radiometer AQT 90 flex is a fully automated immunoassay analyser for the the measurement of βhCG. This analyser is located in Surgical gynae. The analyser measures βhCG on an EDTA blood specimen. Once taken this sample is stable for 3 hrs.



Important Note: Any unexpected results or results not in line with the clinical presentation should be sent to the central laboratory for confirmation.

Biochemistry Test Menu

Blood and Fluids

Test	Specimen type		Additional Information
Time dependant analytes highlighted in Purple Only serum separator tube samples (red top tube) may be centrifuged for 10 mins 30 sec at 2200 g/RCF			
Albumin	Blood Fluid	Serum (Red top tube)	
Alcohol	Blood	Serum (Red top tube)	By Consultant approval when from ED
Alk.Phosphatase	Blood	Serum (Red top tube)	.
ALT	Blood	Serum (Red top tube)	
Alpha Fetoprotein	Blood	Serum (Red top tube)	.
Alpha1 Antitrypsin	Blood	Serum(Red top tube)	
Ammonia	Blood	EDTA (purple top tube)	On ice and transported to Lab immediately Must inform Lab before taking sample Do not send via chute
Amylase	Blood	Serum (Red top tube)	
Anti-CCP	Blood	Serum (Red top tube)	
AST	Blood	Serum (Red top tube)	

Test	Specimen type		Additional Information
Time dependant analytes highlighted in Purple Only serum separator tube samples (red top tube) may be centrifuged for 10 mins 30 sec at 2200 g/RCF			
Beta HCG	Blood	Serum (Red top tube)	
Bicarbonate	Blood	Serum (Red top tube)	
Bilirubin (Total)	Blood	Serum (Red top tube)	
Bilirubin (Direct)	Blood	Serum (Red top tube)	
Blood Gases	Arterial Blood	Arterial Blood Balanced Heparinised Syringe.	**Do not transport in chute.** Needle must NOT be left in syringe. Label sample clearly. Inform laboratory when sending gas especially during on call periods
Calcium	Blood	Serum (Red top tube)	
CEA	Blood	Serum (Red top tube)	.
CA-15.3	Blood	Serum (Red top tube)	
CA-19.9	Blood	Serum (Red top tube)	
CA-125	Blood	Serum (Red top tube)	
Carbamazepine	Blood	Serum (Red top tube)	
Chloride	Blood	Serum (Red top tube)	
Cholesterol	Blood	Serum (Red top tube)	
HDL Cholesterol	Blood	Serum (Red top tube)	
LDL Cholesterol	Blood	Serum (Red top tube)	
C-Reactive Protein	Blood	Serum (Red top tube)	

Test	Specimen type		Additional Information
Time dependant analytes highlighted in Purple Only serum separator tube samples (red top tube) may be centrifuged for 10 mins 30 sec at 2200 g/RCF			
Cortisol	Blood	Serum (Red top)	
Creatine Kinase	Blood	Serum (Red top tube)	
Creatinine	Blood	Serum (Red top tube) or Plasma (Green top tube)	
CSF Protein	CSF	Universal	Contact Laboratory
CSF Glucose	CSF	Universal	
Digoxin	Blood	Serum (Red top tube)	Specimen should be taken at least 6-12 hours post dose.
Electrophoresis	Blood	Serum (Red top tube)	
	EMU or 24H Urine	24Hr container	EMU- full morning void or complete 24h collection
Ferritin	Blood	Serum (Red top tube)	
Folate	Blood	Serum (Red top tube)	
FSH	Blood	Serum (Red Top)	
Gamma GT	Blood	Serum (Red top tube)	
Glucose	Blood	Fluoride EDTA; Adult grey top or Paediatric yellow top tube.	
Haemochromotosis	Blood	EDTA (purple top tube)	
Haemoglobin A1c	Blood	EDTA (purple top tube) or Fluoride EDTA	
Haptoglobin	Blood	Serum (Red top tube)	
IgG **IgA** **IgM**	Blood	Serum (Red top tube)	

Test	Specimen type		Additional Information
Time dependant analytes highlighted in Purple Only serum separator tube samples (red top tube) may be centrifuged for 10 mins 30 sec at 2200 g/RCF			
Iron	Blood	Serum (Red top tube)	
Lactate	Blood	Fluoride EDTA; Adult grey top or Paediatric yellow top tube.	On ice and transported to laboratory immediately Do not send via chute
LDH	Blood Fluid	Serum (Red top tube)	
LH	Blood	Serum (Red top tube)	
Lithium	Blood	Serum (Red top tube)	Specimen should be taken 12 hours post dose
Magnesium	Blood	Serum (Red top tube)	
Oestradiol	Blood	Serum (Red top tube)	
Osmolality	Blood	Serum (Red top tube)	For Water Deprivation Test, contact the laboratory in advance.
	Urine	Random	
Paracetamol	Blood	Serum (Red top tube)	
Phenobarbital	Blood	Serum (Red top tube)	
Phenytoin	Blood	Serum (Red top tube)	

Test	Specimen type		Additional Information
Time dependant analytes highlighted in Purple Only serum separator tube samples (red top tube) may be centrifuged for 10 mins 30 sec at 2200 g/RCF			
Phosphate	Blood	Serum (Red top tube)	
Potassium	Blood	Serum (Red top tube) or Plasma (Green top tube)	GP's must clearly state on request form if potassium testing is required, as it is not included in the GP Renal Profile, however, when the Creatinine level is >150umol/L or when the Potassium level is <3.5mmol/L, Potassium result will be reported. NB Specimen must be received in laboratory within 4hrs of phlebotomy for an accurate potassium measurement.
Progesterone	Blood	Serum(Red top)	
Procalcitonin	Blood	Serum (Red top)	
Prolactin	Blood	Serum (Red top tube)	
Protein (Total)	Blood Fluid	Serum (Red top tube)	
PSA	Blood	Serum (Red)	
PBNP	Blood	Serum(Red Top)	
PTH	Blood	EDTA (purple top tube)	
Rhuematoid factor	Blood	Serum (Red top tube)	
Salicylate	Blood	Serum (Red top tube)	

Test	Specimen type		Additional Information
Time dependant analytes highlighted in Purple Only serum separator tube samples (red top tube) may be centrifuged for 10 mins 30 sec at 2200 g/RCF			
Sodium	Blood	Serum (Red top tube) or Plasma (Green top tube)	
Sweat Test	Sweat	Collected by Medical Scientist, must arrange with Biochemistry Lab ext 4590 in advance.	
Testosterone	Blood	Serum(Red Top)	Male levels only tested at SUH. Female / paediatric testing is referred to an external laboratory
T4 (Free)	Blood	Serum (Red top tube)	Samples with TSH above or below normal range will be processed, otherwise by endocrinologist request.
Total Iron Binding Capacity	Blood	Serum (Red top tube)	
Transferrin saturation	Blood	Serum (Red top tube)	
Triglyceride	Blood	Serum (Red top tube)	
Troponin T Hs	Blood	Serum (Red top tube)	
TSH	Blood	Serum (Red top tube)	
Urate	Blood	Serum (Red top tube)	
Urea	Blood	Serum (Red top tube) or Plasma (Green top tube)	
Valproic Acid	Blood	Serum (Red top tube)	
Vitamin B12	Blood	Serum (Red top tube)	
Vitamin D 25OH	Blood	Serum (Red top tube)	

For further information on test requirements, specimen type and referral lab details for tests not listed above, please contact the Biochemistry department.

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Urine Biochemical Analysis

Obtain the correct collection container from the laboratory for analysis;
Refer to urine sampling guidelines

There are three types of urine container available from the lab;
Plain bottle
Catecholamine / 5HIAA Testing (contains Hydrochloric acid) *
Calcium Testing (contains Hydrochloric acid)*

Health and safety notice

Patient should be informed that container contains acid and be informed of the potential dangers.
Keep acidified containers out of reach of children
In case of contact with eyes or skin, rinse immediately with plenty of water and seek medical advice
Patients must NOT urinate directly into acidified container
Do not breathe any fumes from acidified containers
Please return any unused urine containers to laboratory for appropriate disposal.

Procedure for 24hr urine collection

At the start of the collection (~8AM) empty the bladder completely, this should be done whether or not the patient feels the need.
Collection begins after 1st morning urine is passed.
Note the exact time on the bottle and the request card.
Collect all urine passed for the next 24 hours and place in the collection bottle. The bottle should be kept in a cool place.
Exactly 24 hours later (8AM) empty the bladder completely, whether or not the patient feels the need. Add this final specimen to the collection. Once again note the finish time on the collection bottle and request card.
Promptly send the entire collection and request form to the laboratory in the bag provided.

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Urine specimen requirements

Test	Sample Type	Sent to:
Urine Amino Acids	Random Urine On Ice Only done as a Temple St. request. Clarify with requesting ward clinician. Metabolic Investigation request form must be completed.	Metabolic Lab Temple St
Urine 5HIAA	24hr Urine collection in acidified CATS/HIAA bottle. Within 48 hours prior to the assay, avoid consuming serotonin containing foodstuffs e.g. bananas, walnuts, chocolate, dried fruit, citrus fruit, avocados, tomatoes, plums, kiwis, pineapples and mollusks.	Beaumont
Urinary Arsenic	Random urine	Eurofins
Bence Jones Protein	Screening - random sample. Known cases - 24hr collection	In house
Bone markers in Urine	Random Urine - Send with blood sciences form	Northern General Hospital Sheffield
Urine Calcium (Random)	Paeds only. Random sample -must be sent to lab immediately on ice	In house
Urine Calcium	24hr Urine collection in acidified Calcium bottle	In house
Urine Calcium-Creatinine ratio	Paeds only. Random sample - must be sent to lab immediately on ice	In house
Urine Catecholamines / VMA ***NB: Please note, plasma metanephrines are the test of choice when screening for phaeochromocytomas and paragangliomas** **Urinary catecholamines and metanephrines are no longer available in Beaumont Hospital apart from select cases where confirmatory testing is required/ pre-arrangement with Beaumont Hospital**	***See note** **Adults -** 24hr Urine collection in acidified CATS bottle available from Lab. ***See note: Paeds <15 yrs -** Random sample is acceptable for analysis but must be sent to Biochemistry Laboratory IMMEDIATELY for acidification. (Within 48 hours prior to the assay, avoid consuming serotonin containing foodstuffs e.g. bananas, walnuts, chocolate, dried fruit, citrus fruit, avocados, tomatoes, plums, kiwis, pineapples and mollusks.)	*Beaumont

Test		Sample Type	Sent to:
Urine Chromium		Sample to be taken at end of patients work shift.	Eurofins
Urine Citrate		24hr Urine collection - plain bottle - **must be received by lab immediately**	Eurofins
Urine Citrate (Paeds)		Random Sample on Ice- Send with blood sciences form	Eurofins
Urine Copper		24hr Urine collection - plain bottle	Eurofins Biomnis
Urine Cortisol		24hr Urine collection - plain bottle	Eurofins Biomnis
Urine Creatinine / Creatinine Clearance		24hr Urine collection - plain bottle. Blood sample required to be sent also for calculation of clearance estimation	In house
Urine Cystine	**Adult**	Early morning fasting sample - 10mls. **Must be on ice**	Eurofins Biomnis
	Paed	Random Urine **on ice** (add 1 drop 5% thiomersal). Metabolic Investigation form must be completed.	Metabolic lab Temple St
Hydroxyproline		Early morning fasting sample on Ice.	Eurofins
Urinary Iodine		Early morning Sample - Send with blood sciences form	Eurofins Biomnis
Urine Melatonin			
Urine Metabolic screen (Phos/Uric acid/Calcium)		24hr Urine collection - plain bottle **and** 24hr Urine collection in acidified Calcium bottle (available from Lab)	In house
Urinary Metanephrines ***NB: Please note, plasma metanephrines are the test of choice when screening for phaeochromocytomas and paragangliomas** **Urinary catecholamines and metanephrines are no longer available in Beaumont Hospital apart from select cases where confirmatory testing is**		***See note** **Adults -** 24hr Urine collection in acidified CATS bottle available from Bio Lab. ***See note: Paeds <15 yrs -** Random sample is acceptable for analysis but must be sent to Biochemistry Laboratory IMMEDIATELY for acidification. (Within 48 hours prior to the assay, avoid consuming serotonin containing	Beaumont

Test	Sample Type	Sent to:
required/ pre-arrangement with Beaumont Hospital	foodstuffs e.g. bananas, walnuts, chocolate, dried fruit, citrus fruit, avocados, tomatoes, plums, kiwis, pineapples and mollusks.)	
Methylmalonic Acid	15ml early morning sample on ice	Eurofins Biomnis
Urine Microalbumin/creatinine ratio (MCR)	Random	In house
Urine Microalbumin Excretion 24 Hr	24hr Urine collection - Plain Bottle	In house
Urine Molybdenum	Random urine	Eurofins
Mucopolysaccahrides	Random Urine Sample (add 1 drop 5% thiomersal)	Willink Manchester
Urine Myoglobin	Random Urine, send to lab urgently, requires freezing upon receipt and in <4 hrs.	Eurofins Biomnis
Urine Organic Acids	Urine- send immediately to lab **on ice** with Metabolic Investigation form.	Metabolic Lab Temple St
Urine Oxalate	24hr Urine collection in acidified Calcium bottle	Eurofins Biomnis
Random Urinary Oxalate(Paeds)	Random Urine Sample	Birmingham Children's Hospital
Urinary Porphyrin	24hr Urine collection - plain bottle – protected from light	St.James
Urine Protein 24 HR	24hr Urine collection - plain bottle	In house
Urinary Pyrimidine	5-10ml Random Urine - Send with blood sciences form	Purine Lab St. Thomas's
Purine	5-10ml Random Urine - Send with blood sciences form	Purine Lab St. Thomas's London
Urinary Reducing Substances	10ml of urine avoid 1st sample of the morning. Send on Ice	Eurofins Biomnis
Serotonin (5 Hydroxytryptamine)	24hr Urine Collection in plain container. Dietary restrictions: Within 48 hours prior to the assay, avoid consuming serotonin containing foodstuffs e.g. bananas, walnuts, chocolate, dried fruit, citrus fruit,	Eurofins Biomnis

Test	Sample Type	Sent to:
	avocados, tomatoes, plums, kiwis, pineapples and mollusks.	
Urinary Steroid Profile	17ml Random Sample - Send with blood sciences form	Kings College Hospital London
Sulphonylurea	24hr urine collection – plain bottle	Biomnis
Thallium	10ml Random Urine - Send with blood sciences form	Eurofins Biomnis
TMA Trimethylamine Urea	Random Urine	Metabolic Lab /Clinical Chemistry Sheffield Children's Hospital
Urine Toxicology screen (Benzodiazepine, Barbituates,Opiates,Cocaine, Propoxyphene,Cannabinoids, Amphetamine,Methadone, Ethanol)	Random urine NB. If Ecstasy / Heroin are required, please state on request form	Beaumont

Please contact Biochemistry lab on ext 4142 or 4590 if further advice is required.

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Biochemistry Referrals

Specialised testing that is not available in Biochemistry SUH, may be sent to selected referral laboratories for analysis. Upon completion of analysis, the report is returned to Clinical Biochemistry, where it is scanned and forwarded on to the requesting location. Some referral lab reports are interfaced and are available for viewing electronically.
For further details on referral test requirements and where they are sent, please contact the department.

Drug testing that requires Serum gel free tube on ice

*(See in Green for exception)

DRUG	ALTERNATIVE NAME	SPECIMEN REQUIREMENTS
ALODORM	NITRAZEPAM	
AMIODARONE	CORDARONE	
ATIVAN	LORAZEPAM,TEMESTA	
BENZODIAZEPINE		
BRIVARACETAM		
CHLORDIAZEPOXIDE	LIBRIUM	

CHLORPROMAZINE	LARGITAL	**1 x serum Gel – Free tube**  **Must be frozen <4hrs**
CLOBAZAM	FRISIUM, URBANOL	
CLONAZEPAM	KLONOPIN	
CLOZAPINE		
CORDARONE	AMIODARONE	
DIAZEPAM	VALIUM	
DILTIAZEM		
EFFEXOR	VENLAFAXINE	
ESLICARBAZEPINE	ZEBINEX, TRILEPTAL, OXCARBAZEPINE	
ETHOSUXIMIDE		
FELBAMATE	FELBATOL	
FELBATOL	FELBAMATE	
FLECANIDE		
FLUCOXETINE	PROZAC	
FRISIUM	CLOBAZAM, URBANOL	
GABAPENTIN	NEURONTIN	
GABITRIL	TIAGABINE	
INOVELON	RUFINAMIDE	
INTRACONAZOLE		
KEPPRA	LEVETIRACETAM	
KLONOPIN	CLONAZEPAM	
LACOSAMIDE	VIMPAT	
LAMICTAL	LAMOTRIGENE	
LAMOTRIGENE	LAMICTAL	
LARGITAL	CHLORPROMAZINE	
LEVETIRACETAM	KEPPRA	
LEVODOPA ***Lithium heparin Gel Free tube**	SINEMET***Lithium heparin Gel Free tube**	
LIBRIUM	CHLORDIAZEPOXIDE	
LORAZEPAM	ATIVAN, TEMESTA	
METHANOL		
METHOTREXATE		
METHYLPHENIDATE	RITALIN	
MIRAP	MIRTAZEPINE	
MIRTAZEPINE	MIRAP	
MYSOLINE	PRIMIDONE	
NESDONAL	THIOPENTONE	
NEURONTIN	GABAPENTIN	
NITRAZEPAM	ALODORM	
OLANZAPINE	ZYPREXA,ZOLAFREN	
OXYCARBAZEPINE	TRILEPTAL, ZEBINEX, ESLICARBAZEPINE	

PRIMIDONE	MYSOLINE	
PROZAC	FLUOXETINE	
RISPERDAL	RISPERIDONE	
RISPERIDONE	RISPERDAL	
RITALIN	METHYLPHENIDATE	
RUFINAMIDE	INOVELON	
SABRIL	VIGABATRIN	
SINEMET	LEVODOPA	
TEMESTA	LORAZEPAM, ATIVAN	
THIOPENTONE	NESDONAL	
TIAGABINE	GABITRIL	
TOPAMAX	TOPIRAMATE	
TOPIRAMATE	TOPAMAX	
TRILEPTAL	OXYCARBAZEPINE, ZEBINEX, ESLICARBAZEPINE	
URBANOL	FRISIUM CLOBAZAM	
VALIUM	DIAZEPAM	
VENLAFAXINE	EFFEXOR	
VIGABATRIN	SABRIL	
VIMPAT	LACOSAMIDE	
VORICONAZOLE		
ZEBINEX	ESLICARBAZEPINE, OXCARBAZEPINE, TRILEPTAL	
ZOLAFREN	OLANZAPINE, ZYPREXA	
ZONEGRAN	ZONISAMIDE	
ZONISAMIDE	ZONEGRAN	
ZYPREXA	OLANZAPINE, ZOLAFREN	

The list is intended as a guide only and is not exhaustive.

Requests for Trace Metals

Please use ***Green top, Gel Free Lithium Heparin*** blood tube for the following tests:

Test Name	Sample Type
Aluminium	Lithium Heparin Gel Free plasma (Green Top)
Cadmium	Lithium Heparin Gel Free whole blood (Green Top)
Chromium	Lithium Heparin Gel Free whole blood (Green Top)
Cobalt	Lithium Heparin Gel Free whole blood (Green Top)
Copper	Lithium Heparin Gel Free plasma (Green Top)
Lead	Lithium Heparin Gel Free whole blood (Green Top)
Mercury	Lithium Heparin Gel Free whole blood (Green Top)
Nickel	Lithium Heparin Gel Free plasma (Green Top)
Selenium	Lithium Heparin Gel Free plasma (Green Top)
Zinc	Lithium Heparin Gel Free plasma (Green Top)

Requests for Genetic Testing

Some referral tests require consent form and clinical information forms may be available on line depending on the test.

Genetic investigations, when required at Consultant request, may require arrangement and discussion with the laboratory in advance. All genetic testing to be dispatched to Eurofins Biominis require a signed completed consent form that can be downloaded here https://www.eurofins.ie/biomnis/test-information/test-request-forms/

Genetic testing requests to be sent to the Cytogenetics and Molecular genetics laboratories at the National Centre for Medical Generics in Crumlin also require the completion of the appropriate consent that is available to download here
https://www.olchc.ie/services/departments-a-z/department-of-clinical-genetics/information-leaflets-forms/

For all other genetic testing requirements and forms please contact the main Biochemistry Laboratory at Ext 74590.

Genetic testing user guide

Test Name / Genetic Investigation	*Sample Type*	Form on Q Pulse	*Notes*
Highlighted in red: Samples only accepted on Monday (due to later international dispatch via referral lab).			
Orange fields***: Consultant must contact Chief Medical Scientist*** in Clinical Biochemistry to organise "high cost" test requests ***before sample collection*** (Ms. Noreen Montgomery, Ext. 74561)			
Ambiguous genetalia	2 x EDTA whole blood	PATH-BIO-EXT-38	Crumlin (Molecular Genetics)
Angelman syndrome	2 x EDTA whole blood	PATH-BIO-EXT-38	Crumlin (Molecular Genetics)
Beckman Weideman syndrome	2 x EDTA whole blood	PATH-BIO-EXT-38	Crumlin (Molecular Genetics)
BRCA1 + BRCA2	2 x EDTA whole blood	PATH-BIO-EXT-38	Crumlin (Consultant Geneticist must preapprove testing in Crumlin)-otherwise see next row
BRCA1 + BRCA2	2 x EDTA whole blood	Completed BRCA Test Request & Consent form	Beaumont
Cadasil	2 x EDTA whole blood	PATH-BIO-EXT-38	Crumlin (Molecular Genetics)
CFTR gene	2 x EDTA whole blood	PATH-BIO-EXT-38	Crumlin (Molecular Genetics)
Cholinesterase phenotyping / (Suxamethonium sensitivity)	2 x EDTA whole blood	PATH-BIO-EXT-40	Bristol Genetics Lab
Chromosomal Analysis (PAEDS / < 5yrs old)	2 x Lithium Heparin blood	PATH-BIO-EXT-38	Crumlin (Cytogenetics)
Chromosomal Analysis (Adults / > 5yrs old)	1 x gel free Lithium Heparin tube	PATH-BIO-EXT-39	Eurofins Biomnis
Cochlin genetic test	2 x EDTA whole blood	PATH-BIO-EXT-38	Crumlin (Molecular Genetics)
Connexin	2 x EDTA whole blood	PATH-BIO-EXT-38	Crumlin (Molecular Genetics)
Cystic Fibrosis	2 x EDTA whole blood	PATH-BIO-EXT-38 + PATH-BIO-EXT-25	Crumlin (Molecular Genetics)
Down syndrome	2 x Lithium Heparin blood	PATH-BIO-EXT-38	Crumlin (Molecular Genetics)
Down syndrome maternal marker / Triple test	1 x serum tube on ice	PATH-BIO-EXT-24	Eurofins Biomnis

Test Name / Genetic Investigation	*Sample Type*	Form on Q Pulse	*Notes*
Highlighted in red: Samples only accepted on Monday (due to later international dispatch via referral lab).			
Orange fields***: Consultant must contact Chief Medical Scientist*** in Clinical Biochemistry to organise "high cost" test requests ***before sample collection*** (Ms. Noreen Montgomery, Ext. 74561)			
DPD deficiency testing (DPYD gene + 5FUT activity)	3 x Lithium heparin gel free tube (2 tubes on ice + 1 tube off ice)	PATH-BIO-EXT-41	Eurofins Biomnis
Dravet syndrome / SCNIA	2 x EDTA whole blood	PATH-BIO-EXT-29	Scotland Genetics Lab
Duchenne muscular dystrophy	2 x EDTA whole blood	PATH-BIO-EXT-38	Crumlin (Molecular Genetics)
Ehlers Donlos syndrome	2 x EDTA whole blood	PATH-BIO-EXT-38	Crumlin (Molecular Genetics)
Fabrys disease (genetic screen)	Sanofi blood spot card	PATH-BIO-EXT-28	Willink Unit, Manchester
Fabrys enzyme (alpha galactosidase)	Sanofi blood spot card	PATH-BIO-EXT-28	Willink Unit, Manchester
Facioscapulohumeral muscular dystrophy	2 x EDTA whole blood	PATH-BIO-EXT-38	Crumlin (Molecular Genetics)
Familial Amyloid polyneuropathy	2 x EDTA whole blood	PATH-BIO-EXT-38	Crumlin (Molecular Genetics)
FISH / Karyotyping (PAEDS / < 5yrs old)	2 x Lithium Heparin blood	PATH-BIO-EXT-38	Crumlin (Cytogenetics)
FISH / Karyotyping (ADULTS / > 5yrs old)	1 x gel free Lithium Heparin tube	PATH-BIO-EXT-39	Eurofins Biomnis
Fragile X	2 x EDTA whole blood	PATH-BIO-EXT-38	Crumlin (Molecular Genetics)
Fredreich ataxia	2 x EDTA whole blood	PATH-BIO-EXT-38	Crumlin (Molecular Genetics)
Galactose-1-phosphate uridyl transferase	EDTA whole blood	PATH-BIO-EXT-39	Eurofins Biomnis
Galactose kinase	1 x gel free Lithium Heparin tube	PATH-BIO-EXT-22	Guys & St. Thomas (SAS Genetic enzyme lab)
Gauchers disease	Sanofi blood spot card	PATH-BIO-EXT-28	Sanofi blood spot card
Hereditary spastic Paraplegia	2 x EDTA whole blood	PATH-BIO-EXT-11	Sheffield Childrens Hospital (Genetics Lab)
Huntingtons disease	2 x EDTA whole blood	PATH-BIO-EXT-37 + PATH-BIO-EXT-38	Crumlin (Molecular Genetics)
Klinefelter syndrome (ADULTS)	1 x gel free Lithium Heparin tube	PATH-BIO-EXT-39	Eurofins Biomnis
Klinefelter syndrome (PAEDS)	2 x Lithium Heparin blood	PATH-BIO-EXT-39	Eurofins Biomnis

Test Name / Genetic Investigation	*Sample Type*	Form on Q Pulse	*Notes*
Highlighted in red: Samples only accepted on Monday (due to later international dispatch via referral lab).			
Orange fields***: Consultant must contact Chief Medical Scientist*** in Clinical Biochemistry to organise "high cost" test requests ***before sample collection*** (Ms. Noreen Montgomery, Ext. 74561)			
Krabbe disease	2 x EDTA whole blood and / Sanofi blood spot card	PATH-BIO-EXT-28	Willink Unit, Manchester
Lynch syndrome / Hereditary non polyposis colon cancer	2 x EDTA whole blood	PATH-BIO-EXT-38	Crumlin (Molecular Genetics)
Lysosomal enzymes	2 x EDTA whole blood and / Sanofi blood spot card	PATH-BIO-EXT-28	Willink Unit, Manchester
Marfan syndrome	2 x EDTA whole blood	PATH-BIO-EXT-38	Crumlin (Molecular Genetics)
Microarray analysis	2 x EDTA whole blood	PATH-BIO-EXT-22	Guys & St.Thomas (Genetic Lab), London
Mitochondrial DNA	2 x EDTA whole blood	PATH-BIO-EXT-38	Crumlin (Molecular Genetics)
MODY	2 x EDTA whole blood	PATH-BIO-EXT-3	Crumlin (Molecular Genetics)
Muscular dystrophy	2 x EDTA whole blood	PATH-BIO-EXT-38	Crumlin (Molecular Genetics)
Myosin genetic test	2 x EDTA whole blood	PATH-BIO-EXT-38	Crumlin (Molecular Genetics)
Neurofibromatosis	2 x EDTA whole blood	PATH-BIO-EXT-38	Crumlin (Molecular Genetics)
Noonan syndrome	2 x EDTA whole blood	PATH-BIO-EXT-22	Guys & St. Thomas (Genetic Lab), London
Osteogenesis imperfect	2 x EDTA whole blood	PATH-BIO-EXT-38	Crumlin (Molecular Genetics)
Pierre Robin syndrome (ADULTS)	1 x gel free Lithium Heparin tube	PATH-BIO-EXT-38	Crumlin (Cytogenetics)
Pierre Robin syndrome (PAEDS)	2 x Lithium Heparin blood	PATH-BIO-EXT-38	Crumlin (Cytogenetics)
PMP 22 gene (Charcot-Marie tooth disease)	2 x EDTA whole blood	PATH-BIO-EXT-38	Crumlin (Molecular Genetics)
Pompe Disease	Sanofi blood spot card	PATH-BIO-EXT-28	Willink Unit, Manchester
Prader Willi syndrome	2 x EDTA whole blood	PATH-BIO-EXT-38	Crumlin (Molecular Genetics)
PR55	2 x EDTA whole blood	PATH-BIO-EXT-38	Crumlin (Molecular Genetics)
PTEN	2 x EDTA whole blood	PATH-BIO-EXT-38	Crumlin

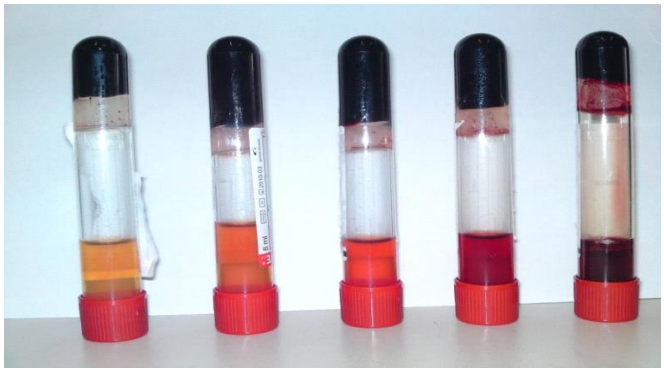
Test Name / Genetic Investigation	*Sample Type*	Form on Q Pulse	*Notes*
Highlighted in red: Samples only accepted on Monday (due to later international dispatch via referral lab).			
Orange fields***: Consultant must contact Chief Medical Scientist*** in Clinical Biochemistry to organise "high cost" test requests ***before sample collection*** (Ms. Noreen Montgomery, Ext. 74561)			
			(Molecular Genetics)
Retts syndrome	2 x EDTA whole blood	PATH-BIO-FRM-9	Crumlin (Molecular Genetics)
Spinal muscular atrophy	2 x EDTA whole blood	PATH-BIO-EXT-38	Crumlin (Molecular Genetics)
SPINK 1 gene	2 x EDTA whole blood	PATH-BIO-EXT-38	Crumlin (Molecular Genetics)
TTR gene	2 x EDTA whole blood	PATH-BIO-EXT-38	Crumlin (Molecular Genetics)
Tubersclerosis	2 x EDTA whole blood	PATH-BIO-EXT-38	Crumlin (Molecular Genetics)
Turners syndrome	1 x gel free Lithium Heparin tube	PATH-BIO-EXT-39	Eurofins Biomnis
Williams syndrome (ADULTS)	1 x gel free Lithium Heparin tube	PATH-BIO-EXT-38	Crumlin (Cytogenetics)
Williams syndrome (PAEDS)	2 x Lithium Heparin blood	PATH-BIO-EXT-38	Crumlin (Cytogenetics)
Wilsons disease	2 x EDTA whole blood	PATH-BIO-EXT-11	Sheffield Childrens Hospital (Genetics Lab)
16p13 Deletions	2 x EDTA whole blood	PATH-BIO-EXT-22	Guys & St. Thomas (Genetic Lab), London

Note: IF THERE IS ANY GENETIC TEST, OTHER THAN THOSE LISTED ABOVE, PLEASE CONTACT THE CLINICAL BIOCHEMISTRY LAB IN ADVANCE OF SAMPLE COLLECTION, TO CONFIRM SPECIMEN REQUIREMENTS. (Extn. 74142 and 74590)

Factors affecting Clinical Biochemistry results

Haemolysis

Haemolysis is defined as red blood cell break down and the release of haemoglobin and intracellular contents e.g. Potassium into the serum. Haemolysis is most frequently an in vitro phenomenon caused by trauma in specimen collection or processing, although slow leakage may also occur.
Haemolysis is graded as slight, moderate or gross.

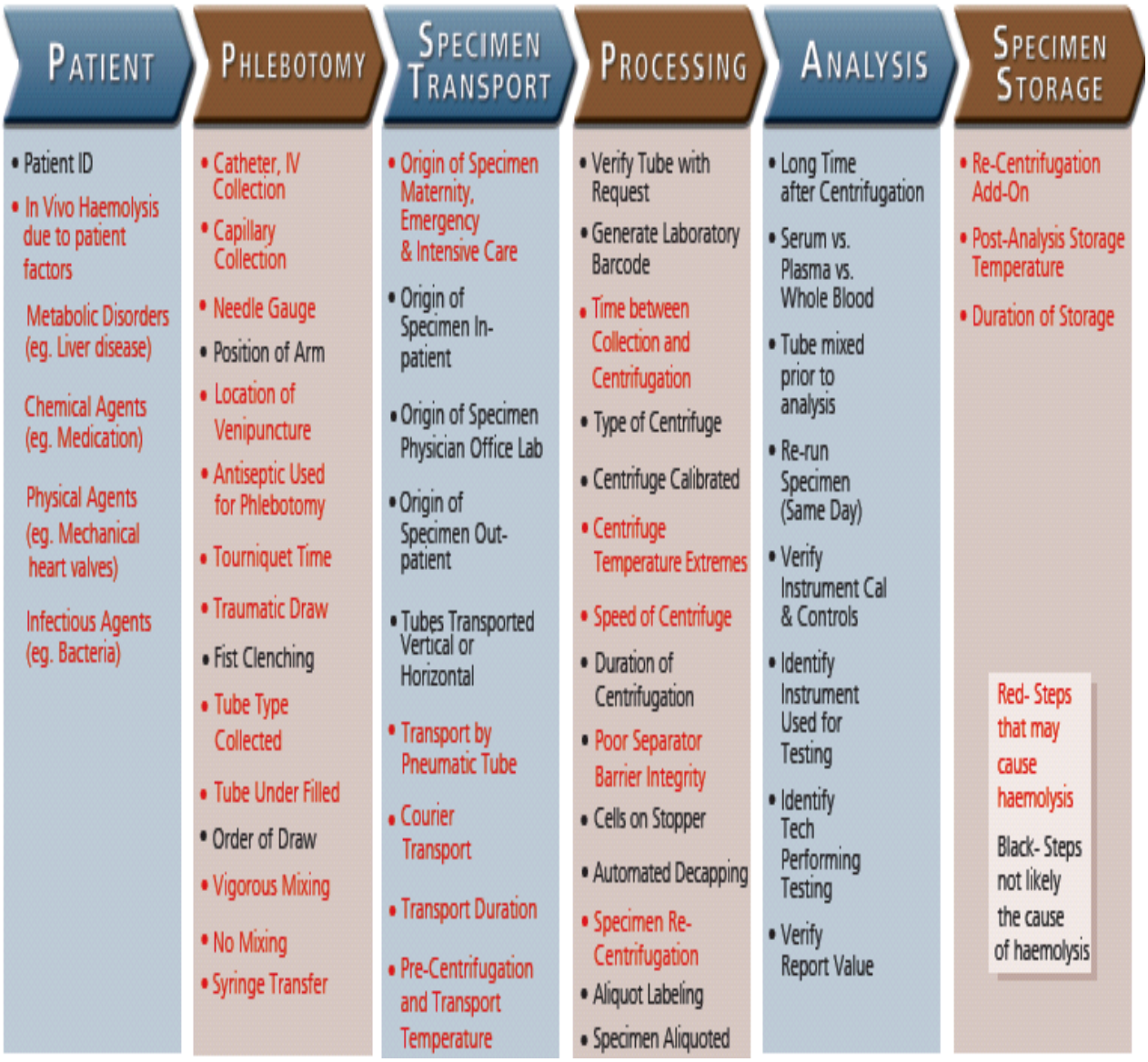


(1) Normal sample, (2) slightly haemolysed, (3) haemolysed, (4) haemolysed(5) grossly haemolysed

Test results on specimens with slight haemolysis are usually processed and comments are attached indicating the degree of haemolysis.
Haemolysed samples will be processed however some analytes cannot be accurately determined and in this instance a result will not be reported.
Grossly haemolysed samples will not be processed by the laboratory.

In the Biochemistry laboratory, the degree of haemolysis on all general chemistry samples is measured and any analytes affected are commented on automatically.

Factors attributed to in vitro haemolysis



For further information, please refer to following links;
www.specimencare.com haemolysis
Oh-No-Its-Haemolysed

Icterus

Icterus (or the icterus dex) is a measure of the yellow colour of serum. This colour is normally due almost exclusively to the presence of bilirubin, a hemoglobin waste product from the red blood cells. The presence of a very high Bilirubin level can interfere with certain analytes. In the Biochemistry laboratory, the degree of icterus in all general chemistry samples is measured and any analytes affected are commented on automatically.

Lipaemia

Lipemia is a measure of serum transparency. High levels of blood lipids, mostly triglycerides, increase serum turbidity. In the Biochemistry laboratory, the degree of lipaemia in all general chemistry samples is measured and any analytes affected are commented on automatically.

NB If a clinician encounters an unexpected result, it is important to consider other possible measurement interferences. It has been documented that certain medications / supplements can interfere with laboratory results. If in any doubt contact the laboratory with as much information as possible regarding medications etc. The laboratory will endeavour to provide guidance on technical limitations when available.

Immunology Referral Tests

Immunology is a broad branch of biomedical science that covers the study of all aspects of the immune system. The diseases caused by the immune system fall into two broad categories: immunodeficiency, in which parts of the immune system fail to provide an adequate response and autoimmunity, in which the immune system attacks its own host's body.

The following Immunology Referral Tests are processed from the Serology Laboratory.

Serology Laboratory Pathology Department Sligo University Hospital Sligo		
Hours of Operation	Routine Service Monday-Friday 0900-1700	
Mr Liam O'Grady	Laboratory Manager	Liam.OGrady@hse.ie 071 917 4560
Ms Noreen Montgomery Ms Anne O Toole	Chief Medical Scientist (Biochemistry / Microbiology)	Noreen.Montgomery@hse.ie 071 91 7 4561 Anne.OToole@hse.ie 071 91 7 4563

Referral tests may take up to 2 weeks for turnaround of results and over 3 - 4 weeks for specimens sent to the UK.

Immunology Referral tests, Sample requirements and Referral Laboratory:

Test	Sample Type/ Additional Information	Sent to:
Acetyl choline receptor antibodies - ACRA	Serum, Oxford request form	OUH, UK
Anti Adrenal gland Abs	Serum	Biomnis
Anti AMPA antibodies	Serum, Oxford request form	OUH, UK
Anti Carbonic Anhydrase II Antibodies	Serum	Biomnis
Anti- DNA Abs	Serum	Biomnis
Anti ENA Abs (SSA, SSB, Sm, Rnp, Jo1, Scl-70)	Serum	Biomnis
Anti GAB receptor Ab, gamma-aminobutyric acid receptor	Serum, Oxford request form	OUH, UK
Anti ganglioside antibodies/ Anti-glycolipid antibodies	Serum	Biomnis
Anti-glomerular basement membrane Ab - AGB	Serum	GUH
Anti- glutamic acid decarboxylase Abs - GAD	Serum	GUH
Anti Histone Abs	Serum	Biomnis
Anti IA2 antibodies – Anti tyrosine phosphatase Abs	Serum	Exeter
Anti-insulin antibodies	Serum, Send urgently to Lab. Must be FROZEN within 4 hr. Collect date and time must be specified on request form.	Biomnis
Anti-intrinsic factor antibodies - AIF	Serum	Biomnis
Anti-islet cell antibodies	Serum	Biomnis
Anti Lipoprotein 4 Ab	Serum, Oxford request form	OUH, UK
Anti Liver Kidney Microsomal Abs - LKM	Serum	Biomnis
Anti Myelin Associated Glycoprotein Abs-MAG Abs	Serum, Oxford request form	OUH, UK
Anti-muscle-specific kinase antibodies-MUSK	Serum, Oxford request form	OUH, UK
Anti Microsomal Abs - See Anti-thyroperoxidase Abs		
Anti-mitochondrial antibodies	Serum	Biomnis
Anti MOG, Anti myelin oligodendrocyte glycoprotein ab	Serum, Oxford request form	OUH, UK

Test	Sample Type/ Additional Information	Sent to:
Anti-neuromyelitis optica Abs – NMO Abs (aquaporin 4)	Serum	Biomnis
Anti N-methyl-D-aspartate receptor antibodies - NMDA	Serum, Oxford request form	OUH, UK
Anti-nuclear Abs - ANA	Serum	Biomnis
Anti-neuronal Abs (Hu, Yo, Ri, CV2, Amphiphysin, Ma1, Ma2)	Serum	Biomnis
Anti-neutrophil cytoplasmic antibodies - ANCA	Serum	GUH
Anti-parietal cell Abs	Serum	Biomnis
Anti Proton Pump Abs	Serum	Biomnis
Anti Saccharomyces cervisiae Abs	Serum	Biomnis
Anti Skeletal Muscle Abs/ Striated Muscle Abs	Test Discontinued	
Anti Soluble Liver Antigen – Anti SLA	Serum	Biomnis
Anti-smooth muscle Abs	Serum	Biomnis
Stronglyoidiasis antibodies	Serum	Biomnis
Anti Synthetase Abs	Serum	Biomnis
Anti-reticulin Abs	Test Discontinued	
Anti Ribosome Abs	Serum	Biomnis
Anti- thyroglobulin Abs	Serum	Biomnis
Anti-thyroperoxidase Abs – Anti TPO	Serum	Biomnis
Anti Titan Abs	Serum	Biomnis
Anti-TSH receptor Abs	Serum	Biomnis
Anti-tyrosine phosphatase antibodies, See Anti IA2		
Beta Interferon Neutralising Antibody	Serum. Gel Separator tube NOT suitable. Use 4 X 1.3 ml micro tubes available from Serology. Serology Lab must be notified before blood is taken. Collect date and time must be specified on request form. Sera must be frozen	Biomnis

Test	Sample Type/ Additional Information	Sent to:
	within 4 hours of venepuncture.	
Bullous Pemphigoid Antibodies (see also Pemphigoid Vulgaris antibodies)	Serum	SJH
C1 esterase inhibitor	Serum	GUH
C1 Inhibitor Function	Serum. Send Urgently to Lab. Frozen ASAP & on same day sample was taken. Collect date and time must be specified on request form.	GUH
CASPR2 (Contactin-2 associated protein)	Serum, Oxford request form	OUH, UK
CD 4 Count from GUM clinic/ HIV Positive patients	EDTA sample X 2. Serology lab must be contacted prior to taking the blood samples. Samples must be taken after 1 pm (Mon-Thurs) to ensure they are transported to SJH within 24 hrs of venepuncture. Specimen collect date and time must be provided on request form.	UHG
Circulating immune complexes (CIC)	Serum	Biomnis
Complement – C3, C4	Serum	GUH
Complement CH100/ CH50 (Total haemolytic complement functional activity)	Serum. Send Urgently to Lab. Frozen ASAP & on same day sample was taken. Collect date and time must be specified on request form.	GUH
DPPX Antibodies	Serum, Oxford request form	OUH, UK
Ganglionic ACRA	Serum, Oxford request form	OUH, UK
Glycine Receptor Abs	Serum, Oxford request form	OUH, UK
Interferon Beta Neutralising Ab – See Beta interferon Neutralising Ab		
LGI1 Antibodies (Anti leucine rich glioma inactivated antibodies)	Serum, Oxford request form	OUH, UK
M2 Subtype Mitochondrial Abs	Serum	Biomnis
Myositis Screen	Serum	GUH

Test	Sample Type/ Additional Information	Sent to:
Natalizumab (Tysabri) Antibodies	Serum, only take on a Mon or Tues. Must be arranged with lab in advance, requires freezing ASAP, bring samples direct to Serology.	Barts, UK
Paraneoplastic antibody markers (includes all neuronal Abs + CRMP5	Serum, Oxford request form	OUH, UK
Pemphigoid Vulgaris Antibodies	Serum	SJH
Pituitary Antibodies	Serum	Biomnis
Scleroderma Screen	Serum	GUH
Voltage gated calcium channel Ab	Test Discontinued	
Voltage gated potassium channel Ab (Oxford Immunology Laboratory Laboratory recommend that LGI1/CASPR2 antibody testing is conducted as a first line test when investigating VGKC antibodies)	Serum PATH-SER-FORM-18 to be used for Oxford Immunology Referral testing	OUH, UK
Zinc transporter 8 Abs	Serum	EX, UK

Immunology Referral Laboratories:

Laboratory	Address	Contact details
Oxford University Hospital Immunology	Clinical Laboratory Immunology Churchill Hospital Churchill Drive Old Road Headington Oxford OX3 7LE UK	Tel: 0044 1865 225995
Biomnis Laboratories Ltd.	Three Rock Road, Sandyford Business Estate, Sandyford, Dublin 18, Ireland.	Results and Test Enquiries **1800 252966** Telephone enquiries 09:00 - 17:30 GMT Web link; main website www.Biomnis.com

Laboratory	Address	Contact details
Galway University Hospital	Galway University Hospital Newcastle Road Galway	Telephone enquiries 09:00 - 17:00 GMT Results and Test Enquiries **091 524765 / 524222 ext 4418**
Immunology Dept Royal London & St Barts Hospital	Immunology, 2nd floor Pathology & Pharmacy building 80 Newark Street, Whitechapel, London, E1 2ES	Tel: 0044 2032460279
Immunology Laboratory, St James's Hospital	St James' Hospital James street, Dublin 8	(01) 416 2928 or (01) 416 2034
Exeter Pathology Services: Royal Devon and Exeter NHS Foundation Trust	Barrack Rd, Exeter (EX UK) EX2 5DW, UK	General Queries 0044 1392 402464 Clinical Queries 0044 1392 402463

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26. Blood Transfusion Laboratory

Blood Transfusion Laboratory
Pathology Department,
Sligo University Hospital,
The Mall,
Sligo. F91 H684

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Blood Transfusion Laboratory Index

Introduction

The Blood Transfusion laboratory is located in the Pathology laboratory on level 4 of Sligo University Hospital. The Blood Transfusion laboratory is an INAB accredited testing laboratory, Reg. No. 198MT. It is accredited to ISO 15189, for activities as defined in its scope of accreditation which can be viewed on the INAB website (www.inab.ie).

Hours of Operation Blood Transfusion Laboratory	Routine Service Monday-Friday(excluding bank holidays) Specimen processing time cut-off is 16:30	 08.00-17.00

	Emergency On call service available outside of these hours	
Phone	Blood Transfusion Laboratory	Ext: **74144** 071 91 **74719**
	On-call	**173440**
Fax	071 917 4515	

If telephoning from inside hospital see extensions in Bold

Access to the Pathology laboratory is restricted to limited hospital personnel. During routine hour's access to the main Pathology laboratory is by keypad/card access door. The Pathology specimen reception office is accessible during routine hours. During emergency on call service hour's access to the Pathology laboratory is through a key pad/card access door. The Pathology specimen reception is not accessible during these hours and specimens which are from outside the hospital are to be delivered during these times by prior arrangement only.

Blood Transfusion Laboratory staff contact details

NAME	JOB TITLE	Contact / Email
Liam O'Grady	Laboratory Manager	liam.ogrady@hse.ie Mobile 087 6184160 Work 071 917 4560
Dr Andy Hodgson	Consultant Haematologist	071 917 4458 Andrew.hodgson@hse.ie
Dr Aine Burke	Consultant Haematologist	071 917 36897 Aine.burke3@hse.ie
Ms Lorraine McCafferty	Chief Medical Scientist	071 917 6881 Lorraine.mccafferty@hse.ie
Ms Cathy Mc Carry	Senior Medical Scientist	cathy.mccarry@hse.ie
Ms Aideen Creaton	Senior Medical Scientist	aideen.mctiernan@hse.ie
Ms Rachel Gilmartin	Quality Officer	071 9174759 rachel.power9@hse.ie
Ms Louise Robinson	Haemovigilance Officer	071 917 4675 Bleep 226 louisem.robinson@hse.ie
Ms Caitriona Gallagher	Deputy Haemovigilance Officer	Caitriona.Gallagher@hse.ie

Information for service users within SUH

For information regarding to the Blood Transfusion service within Sligo University Hospital please refer to PATH-BT-HV-QP16 Blood Transfusion laboratory user manual. The information below is for General Practioners only.

Information for General Practioner users of the Blood Transfusion service

The Blood Transfusion laboratory at SUH provides Antenatal blood group and antibody screening service to General Practitioners and antenatal clinics. The Blood Transfusion department also provides advisory services,

clinical, technical and Haemovigilance advice. The Haemovigilance service is a Consultant led service with a Haemovigilance Officer. The Consultant Haematologist and Senior Scientific staff provides advisory service to all users of the service. The Consultant Haematologist is available for clinical advice on Blood Transfusion issues. Clinical advice on ordering of examinations and on interpretation of examination results is available at the contact details listed above if required.
Note: Blood transfusion samples on females <55 years require a SUH PCN in order to be processed, please see PATH-BT-MEMO-36 Ante-natal booking bloods & RAADP

Blood Transfusion Test Profile Requirements

All specimens should be delivered to the BT laboratory ASAP or within 48 hours for processing.

Test/Profile	Specimen Type	Specimen Requirements			Special Requirements	Routine Turnaround Time on arrival in the BT laboratory
		Additive Required	Volume Required mL	Container Type		
Group and Screen(GRA) Antenatal/GP specimens	Blood	EDTA	6	Pink capped Blood Tube	None	72 hrs
Anti-D Quantitation Anti-c Quantitation Antibody titres	Blood	EDTA	2 x 6mL	Pink capped Blood tube	Sent to the IBTS	Written report—2 weeks. Report phoned to lab when test completed, if results are clinically significant report phoned to requesting clinician.

*For paediatric tests 1 ml is the minimum requirement.
The biological reference ranges and required frequency of repeat examination relevant to the IBTS referred antibody quantitations/titres will be provided by the IBTS as part of the result report.
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Specimen collection for Blood Transfusion

Please refer to intial sections of document Patient consent and Specimen Collection for detail of same.

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Blood Transfusion laboratory request forms/specimen containers

This section outlines the information that is required to be documented on the blood transfusion laboratory request form and the specimen container, prior to the analysis of specimens.

Specimen containers requirements for Blood Transfusion tests:

All blood must be taken into a 6 ml pink capped vacutainer tube.

HAND WRITTEN details or BloodTrack PDA labels are ONLY permitted.
Do not use addressograph labels

The Blood Transfusion Laboratory has one form in circulation: PATH-BT- LF-1

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Labelling the specimen container

This **must** be done at the patient's side directly post phlebotomy. The following **mandatory information** must be handwritten in a legible manner on the specimen container:

- Patient's full name
- Date of birth
- Hospital number (also mandatory for GP specimens on females <55 years old)
- Date and time of specimen collection (time not essential for GP specimens, mandatory if for IBTS referral)
- The signature of the person collecting and labeling the specimen.

Desirable information:

- Patient's Location (desirable information)
- Patients home address (desirable information)

If any of the above mandatory information is not present and correct on the specimen, the specimen will be rejected by the Blood Transfusion laboratory, the clinician will be informed and a new specimen and form requested.

Note: For requests for DCT only, addressograph sample label permitted, only mandatory requirement is minimum of two patient identifiers.

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Completing the request form

Completion of the request form is the responsibility of the clinician, except for area relating to 'Patient identified, specimen taken and labeled by' where completion is by the person taking the specimen. Ensure to provide as much of the following information as is applicable. While some information below may be listed as desirable, it may be of benefit to the patient that it is provided.

The following **mandatory information** must be documented in a legible manner on the request form:

- Patient's Hospital Number (PCN) (also mandatory for GP specimens on females <55 years old)
- addressograph label may be used
- Patient's Full Name (Surname, Forename) addressograph label may be used

- Patient's Date of Birth (Not Age) addressograph label may be used
- Name and contact/bleep number of person who identified the patient, collected and labeled that specimen. (This should be legible)
- Date and time of specimen collection (time not essential for GP specimens, mandatory if for IBTS referral)

If any of the above mandatory information is not present and correct on the request form, the specimen will be rejected by the Blood Transfusion laboratory, the clinician will be informed and a new specimen and form requested.

Desirable information on request form:

- Gender
- Patient's full home address
- Patient's location.
- The name of the requesting Clinician
- Relevant clinical information should be supplied e.g. antenatal history, blood transfusion history etc.
- If antenatal patient, the EDD should be indicated.
- Addressograph labels may be used on the request form.

Note for GPs: If GP does not have a PCN for a patient they must contact Hospital Admissions to obtain same, if PCN is not present on the specimen and request form for females <55 years old it will be rejected.

- All sections of the request form should be completed in full, if information is not available write this on the form.

Please be aware those specimens which are:

- of insufficient volume
- haemolysed
- noted to be in an expired specimen collection tube
- Greater than 48 hours since phlebotomy

will not be processed, as these factors could significantly affect the examination and results. A new specimen and form will be requested.

All Blood Transfusion specimens should be packaged and transported to the laboratory ASAP. Before and during delivery to the laboratory collected specimens should be stored at ambient temperature and not be exposed to extremes of temperature and must be delivered within a maximum of 48 hours of collection.

Packaging and tranpsort

Please refer to intial sections of document on specimen transport and packaging instructions for detail of same.

Storage of examined specimens

Post-analysis, specimens are stored in the Blood Transfusion laboratory at 2-8ºC for up to 14 days. Specimens are disposed of in a rigid yellow bin suitable for disposal of specimens approximately 2 weeks after collection.

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Repeat examination due to analytical failure

In the event of an analytical failure, the Blood Transfusion laboratory will:

Repeat the examination using the manual method
Or
Store the specimens in appropriate conditions until the cause of the analytical failure is identified and corrected and then repeat the examination.

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Further Examination of the Primary Specimen

Further testing may be required to resolve unexpected results and so on occasion the Blood Transfusion laboratory may perform additional tests using the primary specimen, and/or may refer the primary specimen to a referral laboratory for additional or confirmatory examinations.

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Policy on protection of personal information

Please refer to intial section of document on Policy on protection of personal information for detail of same. Personal data may be forwarded to a third party in the case of a referral test.

Complaint procedure

The laboratory documents all complaints received from clinicians, patients staff or other parties and investigates these following the laboratories complaint procedure, PATH-LAB-POL-3 Identification and control of non conformances/complaints/improvement ideas. A complaint may be made by contacting the Blood Transfusion laboratory Chief Medical Scientist or Quality Manager or Laboratory Manager at the contact details given above.
The laboratory ensures that those areas of activity and responsibility involved are promptly investigated
Records of all complaints including appropriate investigations, corrective actions, preventative actions and follow-up actions taken by the laboratory are reviewed and maintained electronically in the laboratories quality management system.
The customer complaints process and outputs are reviewed at quality management meetings and Management review meetings.
If a complaint cannot be resolved at local level the complainant is advised of their right to review by the Hospital Consumer Services.
The laboratory is committed by use of surveys or otherwise to establishing a method of measuring customer satisfaction. Improvements to the service as a result of customer satisfaction surveys are recorded and maintained by the laboratories quality management system.

SUH has a Patient Advice and Liaison Service (PALS) co-ordinator who acts as the main contact between patients, their families, carers and the hospital. They ensure that the patient voice is heard either through the patient directly or through a nominated representative. If a patient wants to provide feedback or make a comment about the hospital and the care they received, the PALS Coordinator will assist them in doing so, or refer them to the appropriate person who will be able to assist them further.

27. Haematology Laboratory

Haematology Laboratory
Pathology Department,
University Hospital,
Sligo.

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For Blood Transfusion Laboratory Index please click here.

Haematology Laboratory Index

Haematology Hours of Operation

Hours of Operation	Routine Service Monday-Friday 08.00-17.00 Emergency On call service available outside of these hours	
	Haematology Lab	071 91 74556
	On-call	**173440**
Fax	071 917 4515	

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Haematology Laboratory staff contact details

NAME	JOB TITLE	Contact / Email
Liam O'Grady	Laboratory Manager	liam.ogrady@hse.ie Mobile 087 6184160 Work 071 917 4560
Dr Andrew Hodgson	Consultant Haematologist	071 917 4458 Andrew.hodgson@hse.ie
Dr Aine Burke	Consultant Haematologist	071 917 36897 Aine.burke3@hse.ie
Ms Sonia Gilmartin	Chief Medical Scientist	071 917 4562 sonia.gilmartin@hse.ie
Ms Wendy McGinty	Quality Officer	071 9136928 or Extn: 76928 wendy.mcginty@hse.ie
Richardson Osawaru	Senior Medical Scientist	071 9174556 richardson.osawaru@hse.ie

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Haematology Laboratory General Information:

The Haematology laboratory has routine hours of 08:00am to 17:00hrs Monday to Friday and outside of those hours is staffed by a single Medical Scientist "On Call"
The tests processed by the Haematology laboratory and the specimen requirements are outlined in the table below.
This laboratory provides diagnostic investigations in general haematology and coagulation including ESR's, blood film reviews, Warfarin monitoring, D-Dimers, Malaria parasite investigation, Sickle cell screening and Bone marrow slide fixing/staining. Specialised investigations not performed at Sligo University Hospital are routed through the Haematology Laboratory to external laboratories, see table below.

Medical advisory services

Clinical laboratory advice is provided by a Consultant Haematologist (with 24/7 telephone cover).

Turnaround Times

Expected turnaround times for common requests are identified in Table below. Turnaround time is defined as the time from specimen receipt in the Pathology Department to the time results are available.

The times stated are deliverable in 95% of instances in normal circumstances. There are times, due to factors outside the laboratory's control, that the stated turnaround times may be exceeded. These events are infrequent and will be explained to users at the time. If the laboratory fails to meet expected turnaround times please contact the Chief Medical Scientist or Laboratory Manager (see contact list).

Blood Films

If abnormalities are detected in the full blood count profile or there is an analyser generated flag, laboratory staff will examine a blood film. The laboratory has set criteria, which will prompt a blood film examination on the patient. These criteria include a significant change from previous values, analyser generated flags or if results are outside laboratory defined levels in the pathological range. The requesting Clinician MUST provide clinical details and reason for Blood Film review if requesting a Blood Film on the request form.
Blood Films may also be referred to the Consultant Haematologist for specialised review.

Bone marrow films/aspirate

Slides, slide holders and RPMI medium is supplied by the Haematology laboratory by request. Where Bone Marrow (BM) into RPMI is to be taken please contact the Haematology laboratory to obtain the appropriate referral laboratory request form as applicable to the referral tests required. Where a bone marrow aspirate is obtained any slides made must be ensured to be adequately labelled at the time of preparation.
Slides should be labelled with the following:

- Patient's name,
- PCN
- Date of preparation of the slide.

Slides must be accompanied by a Blood Sciences request form which contains the patient's details and states Bone marrow as the request. It is advisable that a FBC sample be processed on the same day as the bone marrow aspirate is obtained.
Where aspirate is collected into a RPMI medium or EDTA/ Li Heparin bottles, this must also be labelled with:

- Patient's name,
- PCN
- DOB
- aspiration date

The appropriate referral request form must also be completed with the patient's identifiers, clinical details, test request and signed by a requesting doctor.
Slides and/or BM in RPMI should be delivered by hand to the haematology laboratory. Where slides and/or BM in RPMI require urgent referral to a referral laboratory, please contact the haematology laboratory to discuss.

Coagulation Requests:

The blood to anticoagulant ratio in the coagulation specimen is vital and for this reason, all specimens for coagulation testing **must** be filled to the Black Arrow indicated on the specimen tube. They should not be taken from heparin containing IV lines.
Specimens that are over-filled or under-filled will not be processed.
Haemolysed specimens will also not be processed as the results may be unreliable.
APTT, Fibrinogen and D-Dimer requests can only be processed if the specimen is less than 4 hrs post phlebotomy and the time of sample collection is mandatory on the request form.

Fibrinogen requests and APTT's on patients on a Heparin infusion should be processed as soon as possible after sampling.
It is advisable for all coagulation requests, that the specimens are processed as soon as possible after phlebotomy.
Specimens for special coagulation tests are centrifuged, separated and frozen (within 4 hours of phlebotomy), and sent to a referral laboratory after consultation with the Consultant Haematologist. These specimens should be received in the laboratory at the latest 15.30hrs to allow time for processing and freezing prior to transport. Please contact the laboratory for advice if any other clotting assay is required which is not listed.

Urgent Specimens

During routine hours of 8am to 5pm all test requests from ICU, HAEM/ONC, Day Services, Paeds, AAU and Emergency Department are treated as URGENT and do not require prior telephoned request.
If very urgent analysis is required, please contact the Haematology laboratory on numbers listed above.

On Call Tests

During 'on call' periods the following tests are routinely available:

- FBC

When accompanied by relevant clinical details:

- Coagulation Screen/INR (Please indicate if patient is on Anticoagulants including DOAC's)
- D-Dimers

The following tests can be performed on-call under certain circumstances or when accompanied by relevant clinical details. Please contact the Medical Scientist on call if requesting any of these tests:

- Malarial Parasites
- Sickle Screen
- ESR (Specifically for Temporal Arteritis, Septic Arthritis & Osteomyelitis only)
- Fibrinogen

The Medical Scientist on call must be contacted prior to sending specimens.
To arrange tests outside this profile contact the laboratory or medical scientist on call for further information.

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Haematology Specimen containers:

Tube	Additive	Laboratory use
	Sodium Citrate	For coagulation determinations. Tube inversions prevent clotting. MUST be filled to Black arrow. Time of phlebotomy essential.
	Serum Clot Activator	Tube inversions ensure mixing of clot activator with blood. For Serum specimens

	K3EDTA	K3EDTA for whole blood haematology determinations. Tube inversions prevent clotting. Invert 8-10 times.

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Haematology Routine Test Menu

Test	Specimen type	Additional Information	Turn-Around-Time *
Full Blood Count	EDTA x 1	One specimen is sufficient for FBC and ESR when filled to mark.	1 hour stat 3 hrs routine 48hrs GP specimens
Erythrocyte Sedimentation Rate	EDTA x 1	For ESR analysis on paediatrics- 2 paediatric specimens required.	1 hour stat 3 hrs routine 48hrs GP specimens
Reticulocyte Count	EDTA x 1	Can be added on to FBC specimen.	1 hour stat 3 hrs routine 48hrs GP specimens
Coagulation Screen (on Heparin or Heparin & Warfarin)	NaCit x 1	Specimen **must** be filled to the Black arrow on the tube	1 hour stat 3hrs Routine 4 hrs GP
INR (on Warfarin)	NaCit x 1	Specimen **must** be filled to the Black arrow on the tube	1 hour stat 3hrs Routine 24 hrs GP
Fibrinogen	NaCit x 1	Can be added on to Coag specimen. Specimen should <4hrs	1 hour stat 3hrs Routine
D- Dimers	NaCit x 1	Can be added on to Coag specimen if specimen is within 4 hrs of phlebotomy	1 hour stat 3hrs Routine 4 hrs GP

* Turn Around Time applies to Stat/Urgent specimens **after** they are received in Haematology Laboratory.

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Haematology In-House Special Tests

Test	Specimen type	Additional Information	Turn-Around-Time *
Malaria (Films + Serology Screen)	EDTA x 1	Can be requested on fresh FBC specimen.	3 Hours Antigen screen >24 hrs for complete report

		Contact lab for specific 'Malaria Report' form (PATH-HAEM-QR-22) must be completed.	
Sickle Cell Screen	EDTA x 1	Can be requested on FBC specimen.	1 hr stat 1 week routine

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Referral Tests

Referral Laboratories used by Haematology:

Referral tests are specialised investigations that are processed by the Haematology laboratory and are transported to the various referral laboratories. Results and reports are returned directly to the requesting clinician, so please ensure request forms are completed clearly stating return address or location.
Please note that referral may take in excess of 2 weeks for turnaround of results. Any result enquiries should be made to the appropriate referral laboratory. PATH-HAEM-BC-37 Sample requirements for Haematology available in Phlebotomy department containing sample requirements including collection limitations.

The main referral laboratories are as follows;

Laboratory	Address	Contact details
St. James Hospital.	St James Hospital, James St Dublin 8.	(01)4162956(National Coagulation Lab) (01)4103576 (CMD) (01)4162394(Special Haem) (01)4162927(Immunology)
CHI, Crumlin.	The Division of Pathology and Laboratory Medicine (DPLM), CHI, Crumlin, Dublin	Telephone enquiries Monday-Friday from 09:00-17:00 phone (01)-4096251/ 4096432 Saturday-Sunday from 09:30-12:30 phone (01)-4096251/ 4096432
Eurofins Biomnis Laboratories Ltd.	Three Rock Road, Sandyford Business Estate, Sandyford, Dublin 18, Ireland.	Results and Test Enquiries **1800 252966** Telephone enquiries 09:00 - 17:30 GMT Web link; main website www.Biomnis.com
University College Hospital, Galway	University College Hospital Newcastle Road Galway	Telephone enquiries 09:00 - 17:00 GMT Results and Test Enquiries **091 524765 / 524222 ext 4418**

Laboratory	Address	Contact details
Bristol	H+I Laboratory NHS BT, 500 North Bristol Park Northway Filton Bristol BS34 7QH	00441179217536 Elaine Griffin 00441179217532
Belfast City Hospital	Belfast City Hospital C Floor BCH Tower Lisburn Rd Belfast BT9 7AB	0044 28 95040910 0044 28 950 48138/40914
MLL Germany	MLL Munchner Leukamielabor GmbH Max-Lebsche-Platz 31 81377 Munich Germany	0049 89 990017-0 info@mll.com
Leeds	Haematological Malignancy Diagnostic Service(HMDS) St James Institute of Oncology Level 3 Bexley Wing St James University Hospital Leeds LS9 7TF	0044 113 2067851
Great Ormond St	Immunology Lab, Level 4 Camelia Botnar Laboratories Great Ormond St Hospital for Children NHS Trust Great Ormond Street London WC1N 3JH	0044 020 7839 8835

Haematology Referral Tests

Test name	Specimen type	Information	Referral lab	TAT
Anti-Cardiolipin antibodies	Serum x 1	Generally sent once a week on Monday	Immunology UHG	7 days

Test name	Specimen type	Information	Referral lab	TAT
Anti-Factor Xa	**GUH:** NaCit x 2 **CHI (Crumlin):**Na Cit 1 x 2.9 ml or 2 x 1.3ml	Should be received & centrifuged in lab within 1 hour of phlebotomy. Sample should be taken 4 hours post dose of LMWH. **Form should detail dose &time of administration of LMWH**.	Haematology lab UHG (Adults) CHI Crumlin, (Children <16 yrs old)	UHG 1wk CHI 3- 5 days
ADAMTS 13 assay **Belfast**	NaCit x 1	Send PATH-HAEM-EXT-50 ADAMTS13 activity request form with full clinical details. Sample must arrive between 09.00 & 16.00 Mon-Fri. Contact lab prior to sending.	Belfast City Hospital	~6 STAT 2-3 weeks Routine
B Cell Clonality screen	PB 9ml in EDTA BM 9ml in RPMI AND Immunophenotyping report	Samples should ideally reach CMD lab within 24 hours but can be tested up to 5 days when stored at 4^0C. Send with completed & signed PATH-HAEM-EXT-14 Cancer Molecular Diagnostics- Request for molecular analysis	Cancer Molecular Diagnostics (CMD), St. James's Hospital,	14-21 working days
BCL1-JH t(11;14) (Mantle cell lymphoma) **BCL1-JH t(14;18) (Follicular lymphoma)**	PB 9ml in EDTA BM 9ml in RPMI AND Immunophenotyping report	Samples should ideally reach CMD lab within 24 hours but can be tested up to 5 days when stored at 4^0C. Send with completed & signed PATH-HAEM-EXT-14 Cancer Molecular Diagnostics- Request for molecular analysis	Cancer Molecular Diagnostics (CMD), St. James's Hospital,	14-21 work days

Test name	Specimen type	Information	Referral lab	TAT
BCR ABL (Qualitative or Quantitative) **St James Hospital**	PB 9ml in EDTA BM 9ml in RPMI	Samples should ideally reach CMD lab within 24 hours but can be tested up to 5 days when stored at 4^0C. Send with completed & signed PATH-HAEM-EXT-14 Cancer Molecular Diagnostics- Request for molecular analysis	Cancer Molecular Diagnostics (CMD), St. James's Hospital,	14-21 work days
CALR exon 9 mutations **St James Hospital CMD**	EDTA X 2	Send PATH-HAEM-EXT-14 Cancer Molecular Diagnostics Request Form	Cancer Molecular Diagnostics (CMD), St. James's Hospital,	14-21 working days
CBFB-MYH11 **CMD SJH**	PB 9ml in EDTA BM 9ml in RPMI	Samples should ideally reach CMD lab within 24 hours but can be tested up to 5 days when stored at 4^0C. Send with completed & signed PATH-HAEM-EXT-14 Cancer Molecular Diagnostics- Request for molecular analysis	Cancer Molecular Diagnostics (CMD), St. James's Hospital,	14-21 work days
Cytogenetics (*or other Haem Molecular tests*) MLL	BM in Heparin BM in Li Hep tubes	Packs containing request forms, consent forms, Heparin and Universal Container available in Haematology.	MLL Germany Munchner	~3-6 weeks
Chimerism testing **St James Hospital**	PB: 9ml in EDTA BM: 1ml in RPMI	Send with PATH-HAEM-EXT-14 Cancer Molecular Diagnostics Request for molecular analysis	Cancer Molecular Diagnostics (CMD), St. James's Hospital,	Within 14-21 workingdays.

Test name	Specimen type	Information	Referral lab	TAT
CD3 (cells), CD4 (T Helper), CD8 (T Cytotoxic), CD19 (B cell), CD16/56 (NK cells), **T & B subsets Galway**	Adult: PB: 3ml PB in EDTA X 2 Paeds: PB: 1.2ml PB in EDTA min vol	Time & date of collection must be on form.	Immunology laboratory UHG (Adult **and** Paeds samples)	5 work days
Factor Assays St James Hospital	NaCit x 6 (If only one specific factor level required 1 per factor sufficient)	Should state current anticoagulant status on request form.	Adults: National Coagulation laboratory NCL , St James's Hospital.	1 month
Factor Assays Crumlin	NaCit: 2.9ml per factor requested. Cord blood acceptable	Should state current anticoagulant status on request form.	<16 years: Haematology laboratory, CHI Crumlin	CHI STAT 24 hours
Factor Inhibitor Screen **St James Hospital**	NaCit x6	Send samples Mon-Fri before 15:30hrs. Ensure delivered to laboratory within 4hrs post phlebotomy	Adults: National Coagulation laboratory NCL, St James's Hospital.	1 month
Factor Inhibitor Screen **Crumlin**	NaCit 2x 2.9ml	Send samples Mon-Fri before 15:30hrs. Ensure delivered to laboratory within 4hrs post phlebotomy	<16 years: Haematology laboratory, CHI Crumlin	1 month
Factor V Leiden	EDTA x1	Requires a signed informed **consent form** from the patient(PATH-HAEM-EXT-45)	Eurofins Biomnis	8 days

Test name	Specimen type	Information	Referral lab	TAT
FISH test for diagnostic Multiple Myeloma **Biomnis** **Or** **MLL Germany**	**5ml heparinised bone marrow** required (ambient temp). Please complete request form PATH-HAEM-EXT-77 (both sides)	Sample should be taken Mon/Tue after 13:00hrs only	Eurofins/Biomnis France	21 days from day plasma cell content confirmed
FLT3-ITD AML molecular studies	PB 9ml in EDTA BM 9ml in RPMI	Samples should reach CMD lab within 24 hours but can be tested up to 5 days when stored at 4^0C. Send PATH-HAEM-EXT-14 Cancer Molecular Diagnostics-Request for molecular analysis	Cancer Molecular Diagnostics (CMD), St. James's Hospital,	14-21 work days
Haemoglobin Electrophoresis	PB: Min vol 0.2ml in EDTA	Sample must be <7 days old on day of testing. Store and transport at 4^0C.	Haematology laboratory, CHI Crumlin.	7 days
Haemoglobin Electrophoresis	PB: 1 x 4ml EDTA & blood film	Store and transport at 4^0C. Send blood film and Use PATH-HAEM-EXT-52 SJH Haemoglobinopathy laboratory request form	Haem lab, St. James Hospital	7 days

Test name	Specimen type	Information	Referral lab	TAT
HIT screen (Heparin Induced Thrombo-cytopenia)	Serum: 2 x 6ml	Must have a clinician completed PATH-HAEM-EXT-1 SJH HIT request form & pre-test probability score of ≥4. Sens samples Mon-Thurs before 15:30hrs. Ensure to deliver to Laboratory within 4hrs post phlebotomy.	National Coagulation laboratory NCL, St James's Hospital. .	1 day to 2 weeks
HLA B27 genotype	PB: EDTA x 2 Paed: min vol 0.5ml EDTA	Requires a signed informed **consent form** from patient PATH-HAEM-EXT-45	Biomnis	7 days
Hereditary Spherocytosis (EMA screen) **St James Hospital**	PB: EDTA sample > 0.5ml	Contact Laboratory to discuss prior to taking specimen as must be received by referral Laboratory within 18-24hrs. FBC & blood film required.	Adults: Special Haem lab St. James Hospital	1 week
Hereditary Spherocytosis (EMA screen) **Crumlin**	PB: EDTA sample > 0.5ml	Patient must be >3months old and must be analysed within 72hrs. If receipt > 24 hrs include FBC & Retic count.	<16 years: Haematology laboratory, CHI Crumlin	1 week
IgVH Mutation Status	PB 9ml in EDTA BM 9ml in RPMI AND Immunophenotyping report	Samples should reach CMD lab within 24 hours but can be tested up to 5 days when stored at 4^0C. Send PATH-HAEM-EXT-14 Cancer Molecular Diagnostics-Request for molecular analysis.	Cancer Molecular Diagnostics (CMD), St. James's Hospital,	14-21 work days

Test name	Specimen type	Information	Referral lab	TAT
Immuno-phenotyping **Galway**	**BM:** Collected in RPMI &1 PB & 1 BM unfixed, unstained slide if available. **PB:** 3ml EDTA &1 unfixed, unstained slide. **CSF**: CSF > 1.5 ml collected in Transfix	**For UHG** use PATH-HAEM-EXT-15 UHG Request for Specialised Haematology Tests. .	Haematology lab, University Hospital Galway	2-5 days
Immuno-phenotyping **St James Hospital**	**BM**: Collected in RPMI& 2 BM unfixed, unstained slide & 1 PB unfixed, unstained slide if available. **PB:** 3ml EDTA &1 unfixed, unstained slide. **CSF:** Collected in RPMI /Heparin	Use PATH-HAEM-EXT-41 SJH Haematology request for Flow Cytometry (Immunophenotyping)	Special Haem lab. St. James Hospital	2-5 days
JAK2 **(MPN Panel)**	3 ml EDTA x 2 BM in RPMI	Send PATH-HAEM-EXT-14 Cancer Molecular Diagnostics-Request for molecular analysis	Cancer Molecular Diagnostics (CMD), St. James's Hospital,	14-21 days

Test name	Specimen type	Information	Referral lab	TAT
Leucocyte Adhesion Deficiency (CD 18/CD 11)	3 ml EDTA x1	Must be analysed <5 hrs of phlebotomy. *Prior arrangement with referral lab before phlebotomy. (Specialist test not all staff trained)*	Immunology Lab St. James Hospital	5 days
LUPUS Anti-coagulant	NaCit x 2	Ensure delivered to Laboratory within 4hrs post phlebotomy and before 15:30hrs.	Biomnis	4 days
Methylene tetrahydrofolate reductase MTHFR gene C677>T mutation	3 ml EDTA x 1	Requires a signed informed **consent form** from patient. PATH-HAEM-EXT-45	Biomnis	9 days
Molecular Genetics Crumlin	3ml EDTA (DNA analysis)	Use PATH-HAEM-EXT-51 and see instructions on the rear of form for sample requirements.	Department of Clinical Genetics, CHI Crumlin.	Depends on test requested
Myeloid Gene Panel NGS (next generation sequencing) CMD	9 ml in EDTA PB Or 9ml in RPMI	Send with PATH HAEM EXT 14 within 24hrs of sampling. In section “other” enter Myeloid NGS Gene panel	Cancer Molecular Diagnostics (CMD), St. James's Hospital,	<28 days
MYD88 (For Waldenstrom's macroglobulinemia)	PB: EDTA min 6ml BM: Collected in EDTA & fresh BM smear	Samples must be taken in am and sent same day with Biomnis Mon-Wed. Use PATH-HAEM-EXT-49 referral request form	Leeds	4-14 days
NPM1 **CMD SJH**	PB 9ml in EDTA BM 9ml in RPMI	Send PATH-HAEM-EXT-14 Cancer Molecular Diagnostics-Request for molecular analysis	Cancer Molecular Diagnostics (CMD), St. James's Hospital,	14-21 work days

Test name	Specimen type	Information	Referral lab	TAT
PML-RARA **CMD SJH**	PB 9ml in EDTA BM 9ml in RPMI	Send PATH-HAEM-EXT-14 Cancer Molecular Diagnostics-Request for molecular analysis.	Cancer Molecular Diagnostics (CMD), St. James's Hospital,	14-21 work days
Plasma viscosity	PB: EDTA x 3	Samples must be taken am. Contact Lab to discuss time of sampling. Must be received in UCHG<24hrs.	Haematology lab, University Hospital Galway	1 day
PNH Paroxysmal Haemoglobin-uria **St James Hospital**	PB: EDTA x 2	Samples must be taken before 15:30hrs Mon-Thurs. Sample to arrive in referral lab <48 hrs of phlebotomy.	Special Haematology St James Hospital	24 hrs
Prothrombin G20210A mutation (Factor II)	PB: 5 ml EDTA	Requires a signed informed **consent form** from patient (PATH-HAEM-EXT-45)	Biomnis	8 days
Red cell folate	PB: 3ml EDTA	Store at RT, send with Biomnis.	Biomnis	1 week
RUNX1-RUNX1T1 **CMD SJH**	PB 9ml in EDTA BM 9ml in RPMI	Send PATH-HAEM-EXT-14 Cancer Molecular Diagnostics-Request for molecular analysis	Cancer Molecular Diagnostics (CMD), St. James's Hospital,	14-21 work days
Soluble CD25 **SJH Immunology lab** ***or*** **GOSH London**	PB: Serum x1	Separate serum. Samples for CD25 (Interleukin 2 Receptor alpha) must be received in the SJH laboratory as soon as possible post collection.	Immunology Laboratory St James Hospital Dublin or Immunology lab, Great Ormond Street Hospital for Children NHS Trust, London.	21 days

Test name	Specimen type	Information	Referral lab	TAT
Thrombophilia screen	NaCit 6 x3ml	Haematology team must be contacted prior to taking specimens to discuss clinical details. Ensure samples delivered to laboratory within 4 hours post phlebotomy and before 15:30hrs.	Adults: Biomnis	4 days
Thrombophilia screen	Crumlin: NaCit 2 x 3ml	Haematology team must be contacted prior to taking specimens to discuss clinical details. Ensure samples delivered to laboratory within 4 hours post phlebotomy and before 15:30hrs.	<16 years: Haematology laboratory, CHI Crumlin.	1 month
T Cell Clonality screen	PB 9ml in EDTA BM 9ml in RPMI	Send PATH-HAEM-EXT-14 Cancer Molecular Diagnostics-Request for molecular analysis	Cancer Molecular Diagnostics (CMD), St. James's Hospital,	14-21 work days
T cell receptor (TCR) gene rearrangement	PB: 3ml EDTA	Send PATH-HAEM-EXT-14 Cancer Molecular Diagnostics-Request for molecular analysis	Cancer Molecular Diagnostics (CMD), St. James's Hospital.	14-21 days
TP53 mutation	PB: EDTA 9ml (3ml sufficient)	Send PATH-HAEM-EXT-14 Cancer Molecular Diagnostics-Request for molecular analysis	Cancer Molecular Diagnostics (CMD), St. James's Hospital,	6 weeks
Urinary Haemosiderin	Urine 5-10mls universal	Store and transport at RT	Special Haematology St James Hospital Dublin	48 hrs
VITT **Vaccine Induced Thrombotic Thrombocytopenia**	2 x Serum samples	Send PATH HAEM EXT 61 referral request form. Must have Consultant to Consultant approval prior to analysis.	National Coagulation laboratory NCL, St James's Hospital.	2 working days
Von Willebrand screen **Crumlin**	NaCit 2 x 3ml	Ensure samples delivered to laboratory within 4 hours post phlebotomy and before 15:30hrs.	<16 years: Haematology laboratory, CHI Crumlin.	6-8 weeks

Test name	Specimen type	Information	Referral lab	TAT
Von Willebrand screen	NaCit 6 x 3ml	Store and transport frozen.	Adult: National Coagulation laboratory NCL, St James's Hospital.	3-6 weeks
White Cell Antibodies (Anti Neutrophil antibodies)	Serum x1 (& 1 x EDTA if available)	Sample to be sent with completed PATH-HAEM-EXT-19: NSH 3E Granulocyte Immunology Request form. Mon/Tues/Wed	H+I Laboratory NHS BT, Bristol	21 work days

Haematology critical alert values

Initial critical results will be phoned, however subsequent abnormal results will not.

Test	Unit	Critical alert value
Hb-male	g/dl	**<7.0 or >20.0**
Hb-female	g/dl	**<7.0 or >20.0**
Hb-neonate	g/dl	**<10.0**
Platelets	$X10^9/l$	**<50 or >600**
WCC	$X10^9/l$	**>30 (GP patients only and not a Chronic Lymphocytic condition)**
Neutrophils	$X10^9/l$	**</=0.5**
Blood Film		**Acute Leukaemia or Thrombotic thrombocytopenic purpura (TTP)**
INR		**>5.0**
APTT	secs	**>50**
D Dimers	ng/ml	**>255 (GP's only)**
Fibrinogen	g/L	**<1.5**
Sickle Screen		**Positive**
Malaria		**Positive**

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28. Microbiology Laboratory

Microbiology Laboratory
Pathology Department
Sligo University Hospital
Sligo

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Microbiology Laboratory Index

1. Microbiology Hours of Operation

***Hours of Operation**	Routine Service: Monday-Friday 0800-2000* Emergency On call service available outside of these hours	
Phone**	On-call	Internal Speed dial173 444 or 087 3293875
	Microbiology Main Laboratory	071 917 74557 071 917 74169
	Laboratory	071 917 1111 ext 74159
	Infection Prevention and Control	071 917 74161
	Fax	071 917 74658

Table 1 Microbiology Hours of Operation

* Specimens submitted after 18.00 hrs may not be processed on the day of receipt therefore every attempt should be made to ensure that all specimens are transported to the laboratory prior to that time.

** The Microbiology Laboratory only answers phone calls between: **12.00-1300** and **14.30-15.30**. For urgent communications only (not results service) during these hours or in an emergency situation outside of these hours, please contact the laboratory on: **087-3293875** or internally on speed dial 173 444.

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2. Microbiology Laboratory Staff Contact Details

Title	Name	Phone*	Bleep	Email
Microbiology lab for general enquiries		071 91 **74557**		
Serology lab for general enquiries		071 9171111 ext. **74159**		
Consultant Microbiologist	Dr. Ana Rueda Benito	071 9171111 ext **74162**		Ana.RuedaBenito@hse.ie
Consultant Microbiologist	Dr. Vlasta Zujic Atalic	071 9171111 ext **74163**		Vlasta.zujicatalic@hse.ie
Consultant Microbiology Secretary	Alison Murphy	071 91**72501**		Alison.Murphy7@hse.ie
Chief Medical Scientist	Anne O'Toole	071 91**74563**		anne.otoole@hse.ie
Specialist Medical Scientist	Caroline Brennan	071 91**74563**		Caroline.Brennan4@hse.ie
Surveillance Scientist (Specialist)	Karen Hickey	071 91**74140**		KarenM.Hickey@hse.ie
Quality Manager	Mike Mitchell	071 91**74434**		mike.mitchell@hse.ie
Senior Medical Scientist	Esther McCormack	071 91**74563**		esther.mccormack1@hse.ie
Senior Medical Scientist	Marie Gunning	071 91**74563**		Marie.Gunning2@hse.ie
Senior Medical Scientist	Jen McGuinn	071 91**74563**		Jennifer.McGuinn@hse.ie
Senior Medical Scientist	Lisa Armstrong	071-9174557		lisaa.armstrong@hse.ie
Senior Medical Scientist (Acting)	Ciara Gorman	071-9174557		ciara.gorman2@hse.ie
Senior Medical Scientist (Serology)	Mathona Conheady	071 9171111 ext **74159**		mathona.conheady@hse.ie
Infection Prevention and Control	ADON Jean McGuinness	071 9171111 ext **74161**	Bleep 131	Jean.Mcguinness@hse.ie
	CNS Ciaran Adams	071 9171111 ext **74161**	Bleep 117	ciaran.adams@hse.ie
	Elaine Doherty	071 9171111 ext 76904		Elaine.doherty1@hse.ie

Table 2 Microbiology Staff Contact Details

* Internal extensions in bold digits.

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3. Introduction

This manual is designed to give an overall view of the services available in the HSE West and North West, Sligo University Hospital, Microbiology Laboratory. It is intended as a quick reference guide for both GPs and Hospital Clinicians.

Please note this manual is intended for use as a guide only.

4. Service Description

The SUH Microbiology laboratory complies with and has been accredited to the International Standard ISO15189 since February 2014, Irish National Accreditation Board (INAB) registration number **321MT**, the scope of Accreditation is published on the INAB website at INAB 321MT. Any deviations from or non-fulfilment of our Quality Management System are recorded as non-conformances, corrective and preventive actions implemented and follow-up monitoring implemented.

This department offers a comprehensive range of diagnostic services in routine Bacteriology, Parasitology, Serology and Virology. All Mycobacteriology is referred to University Hospitals Galway. Mycology samples (other than Corneal Scrapings) are analysed by external reference laboratories. The department also offers consultation in microbiology, infectious diseases and antibiotic utilisation and provision of statistical and cumulative data for infectious disease monitoring.

The proper selection, collection and transport of specimens to the laboratory is an essential part of the quality assurance of the microbiology laboratory. Results are reported rapidly and phoned if necessary to ensure timely intervention for optimum patient care. As part of the quality assurance process within the laboratory, turnaround times are routinely audited.

5. Scope of the Service

- Diagnostic Bacteriology including Antimicrobial Susceptibility Testing.
- Diagnostic Microbial Serology and Virology.
- Guidance on Antimicrobial Chemotherapy.
- Guidance on Infection Prevention and Control and Outbreak Management

6. Ward access to laboratory management system

The Laboratory Information System was not designed for ward access to Microbiology results. The system allows access to incomplete and/or unauthorised results. If accessing the LIS to view microbiology results, the user MUST ensure he/she scrolls through ALL windows associated with the particular report in order to view all interpretations and comments and check the report status.

Results with a report status of **'pending'** are unauthorised and may be subject to change.

7. On-Call Service

The Microbiology laboratory provides an out of hours on call test service. See the Main Introduction Section of this document for a guide to the tests available pre and post midnight and the criteria used for selection.
Microbiology On call Tel. no. **173444**

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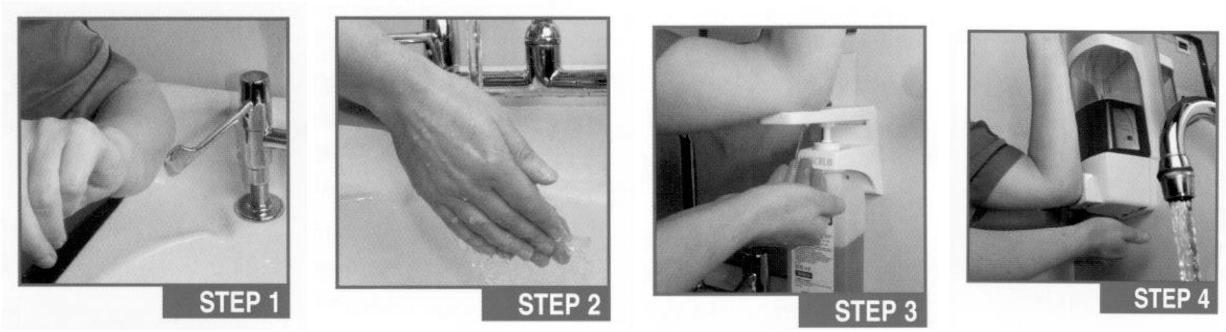
8. Sample collection and identification, laboratory request forms, specimen containers

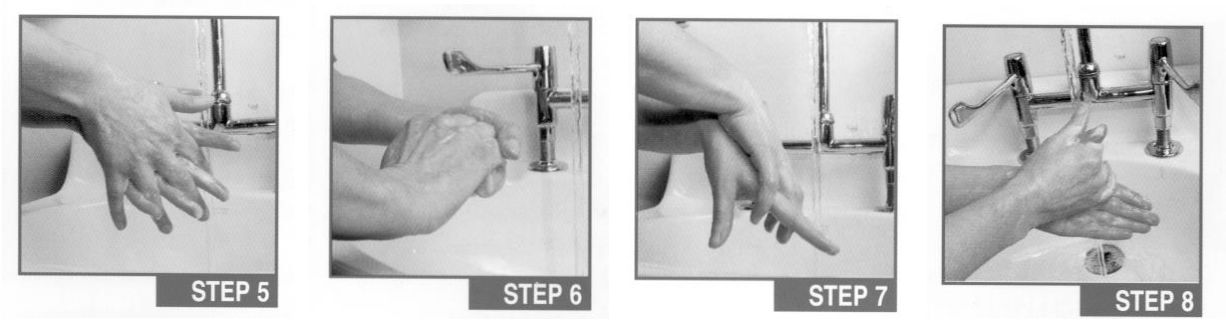
The SUH Microbiology Laboratory refers to ISO 20658 standard that provides detailed information for sample collection and transport. This document is available on Qpulse (PATH-MICRO-EXT-462).

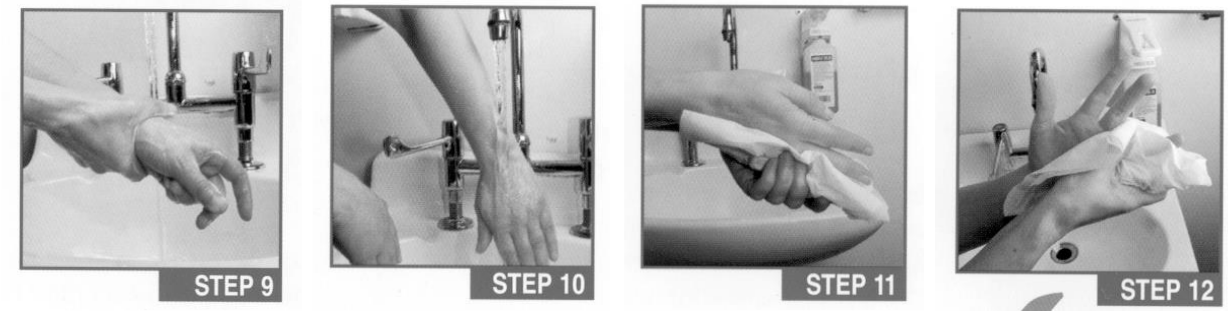
Handwashing Instructions

Hands should be washed by systematically rubbing all parts of the hands and wrists with soap and water, paying particular attention to those areas of the handwhich are frequently missed e.g. finger tips, between the fingers, around the thumbs and back of the hands.

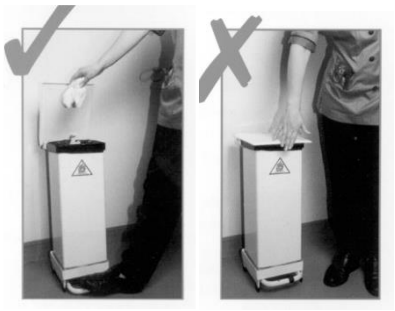
- STEPS 1, 2 Turn on the tap using an elbow to operate the controls. Wet hands under running water.
- STEPS 3, 4 Dispense approximately 5mls of antiseptic handwash into cupped hand.
- STEPS 5-9 Wash hands thoroughly for 10-15 seconds without adding more water.
- STEP 10 Rinse hands thoroughly under running water.
- STEPS 11, 12 Turn off the tap again using your elbow. Dry hands carefully with disposable paper towels. Cotton communal towels should NOT be used under any circumstances.







- Dispose of paper towel into waste bin lined with black plastic bag. Use Foot control to operate bin. Do not open or close the lid with your hand.



General Information on Collection of Microbiology Samples

- Wash and dry hands carefully before and after collection of microbiology specimens.
- Each specimen should be considered potentially infectious and handled using Standard Precautions.
- The value and reliability of the results of many diagnostic bacteriological tests is largely dependent on correct procedures being followed when tests are requested.
- Microbiology results depend critically on the type and quality of the material received. Therefore this material should be representative and fresh.
- All specimens of infectious material should have their container lids securely tightened prior to transportation to ensure safe arrival in the laboratory and enclosed in a bag attached to a request form.

Procedure for identification of patients

For In-Patients

- This procedure should include asking the patient to state his/her full name and date of birth e.g. patient should be asked ‘what is your name?’ NOT ‘are you Mr/Mrs Murphy?’
- The information given by the patient must be identical to that on the patient’s identity band. Do not take specimens if this information is incorrect.

- Specimen tubes can be labeled with addressograph label (except for Blood Transfusion) or hand written and labeled immediately after sampling at the patient's bedside. Write the patient's name, PN, date of birth and date and time (if required) of sampling on the bottle. The person drawing the specimen must sign the specimen and the request form.

For GP/ Out patients

- The person taking the specimen should ask the patient to state their full name and date of birth e.g. patient should be asked 'what is your name' not 'are you Mr/Mrs Murphy?'
- The specimen should be labeled at the time of sampling and the information given by the patient must correlate with that which is used to complete the specimen and request form. '

Collect specimens before commencement of antimicrobial therapy. This is usually possible for most mild infections. For more serious infections, antimicrobial therapy should not be withheld pending collection of a specific specimen. For example, antimicrobial therapy should not be withheld pending collection of CSF from an individual with suspected meningitis or collection of sputum from an individual with severe pneumonia. However, blood cultures can be obtained in nearly all cases prior to antimicrobial treatment of serious infection.

Please send an adequate amount of specimen. As a general rule – 'the more specimen the better'. If pus is present, send pus rather than a swab and remember to send enough specimen if a whole series of tests are required. This applies to CSF and serology specimens in particular.

For more detailed information regarding collection procedures for an individual test please refer to LIST OF MICROBIOLOGY TESTS AND THEIR SAMPLE REQUIREMENTS where a comprehensive list of Microbiology/Serology tests are listed in alphabetical order.

Disposal of Waste Material Used in Specimen Collection

All materials used in specimen collection should be treated as potentially hazardous and discarded using sharps containers and other appropriate colour coded bags. Please refer to the current hospital guidelines for Waste Management prepared by the Infection Prevention and Control Committee.

Completing the Request Form

The **Mandatory details** required for processing patient specimens, are

a) **Clinical details.** For example, include details if the specimen is sent during an outbreak or there is a history of foreign travel or a specific diagnosis is being considered; include any history of administration of antimicrobial drugs. All of the above may influence the type of test that the laboratory performs.

b) Collection times

c) Requesting Doctor and patient location completed.

Specimen Identification

Refer to specimen acceptance guidelines in this manual (Table 1 below).

N.B. All specimens from suspected or known cases of TB, CJD, hepatitis B & C, AIDS and HIV infection etc. must be treated as high risk specimens and a special **biohazard label** must be attached to both the appropriate specimen container and request form. The microbiology laboratory should be contacted before sending such specimens. Blood specimens from high risk patients must be taken by experienced staff. Gloves must be worn during venepuncture and the use of plastic aprons and eye protection is also advised, if considered appropriate.

9. Specimen Containers

Adult blood culture bottles (aerobic and anaerobic)

Paediatric blood culture bottle

Urine Container

 BD Vacutainer® Plus urinalysis tubes	 BD Vacutainer® urine collection cup

Sterile universal container

Adult serum bottle

EDTA bottle (Purple Top)

Adult EDTA Bottle	Paediatric EDTA Bottle
	

Blue Amies Agar Transport Gel Swab

Blue top swab. Stiff plastic shaft. Amies agar transport medium. General use swab for recovery of aerobes, anaerobes and fastidious organisms.

Orange Amies Agar Transport Gel Swab

Orange top swab. Amies agar transport medium. Firm wire shaft, ideal for ear and male urethral sampling.

Blue Minitip Amies Agar Flexible Twisted Wire Swab

Blue top flexible wire with a mini tip swab. Specifically for nasopharyngeal sampling. Very flexible, will bend and yield when in contact with posterior nasopharyngeal wall. Features a safe loop shaped wire tip covered with soft rayon. Amies agar transport medium.

Viral swab (Pink or Green top)

Pink or green top swab containing a viral transport media. **Note 1**: Never refrigerate viral swabs after collecting a sample. **Note 2**: Viral swabs are not suitable for routine bacterial culture and will not be processed for same.

SARS-CoV-2 / Respiratory Virus Screen

The required specimen is a nasopharyngeal swab into 3 ml of Universal Transport Medium (UTM-RT). See picture above. These can be provided by the laboratory on request. Please note if a liquid swab is not submitted, SUH Microbiology Laboratory cannot provide the rapid testing.

Mycotrans or Dermapack Type 3 Envelope or equivalent

Place specimen in centre of fully opened envelope. Close by re-folding and seal by removing backing strip. For additional security place envelope in outer transport bag and seal.

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10. Transport, Non conformance, additional test requests and storage of examined specimens

Transport of Specimens to the Laboratory

Refer also to general guidelines on transport in the Introductory section of this manual.

Specimens should be transported to the laboratory without delay to ensure optimal results. Commensal bacteria e.g. Coliforms or Coagulase negative Staphylococci present in the original sample or introduced accidentally at sampling, can survive and multiply at room temperature before the specimen is processed, and can gain an advantage in numbers over the pathogens which are subsequently outgrown. Therefore all specimens for culture should be submitted to the laboratory on the day of collection and with minimal delay.

All specimen containers must be tightly closed and placed in a transparent hazard bag for transport to the laboratory.

It is the responsibility of the person dispatching the specimen to the laboratory to ensure that it is packaged correctly, and does not pose a risk to anyone coming in contact with it during transport or on receipt in the laboratory.

All CSF specimens are treated with priority in the Microbiology Laboratory. Outside normal hours the requesting clinician must ensure that the on call medical scientist in Microbiology is aware that a CSF is expected.

CSF specimens should not be transported via the pneumatic tube system.

11. **High Risk Specimens**

It is a requirement that laboratory specimens from patients who have known or suspected Risk Group 3 infections be labeled in such a manner that this knowledge be conveyed to the laboratory. Specimens from these patients should be labeled **Biohazard** or **Danger of Infection**. The specimen container should be labeled on the outside and clearly visible. The accompanying paperwork should be appropriately labeled.

12. Reasons for Rejection/ Abridged testing of Samples received in Microbiology

It is the policy of the laboratory to endeavor to process all microbiology samples so long as they do not fall into any of the rejection criteria listed below.

Every attempt is made to allow sufficient time for corrective action to be performed by the clinician. Unfortunately not all rejection scenarios may be amended and the clinician may have to take a repeat sample. See List and Table below:

- Incomplete or illegible request form
- Specimens deviating from Specimen acceptance criteria
- Specimens submitted in an unsterile or incorrect container
- Tissue/ specimen received in formalin or other fixative
- Specimens which have leaked, either because the container has been damaged or the lid has not been tightened correctly.
- Samples that are too old to process either due to transportation delay or incorrect long term storage. See individual tests for more detailed criteria.
- Samples received with no clinical details or inappropriate clinical details provided on request form
- Unnecessary repeat requests

Note: Some samples may be subjected to an abridged testing protocol depending on the results obtained from preliminary testing eg urine samples may not be cultured if White Blood cell count is low with the presence of epithelial cells, as this is likely to yield contaminating organisms.

Table 3 Microbiology Samples Rejection/Abridged Testing Criteria

Scenario	Action	Exceptions	Rationale
Labelling/Identification Incomplete or illegible request form	Sample not processed. Report issued stating that Incomplete clinical details were provided	• CSF samples • Blood Culture samples • Unrepeatable samples	Sample must be labeled with two out of three unique identifiers which must be correct and match the information given on the request form. These are (i) **Surname &Forename *(Essential)*** (ii) **Date of birth** (iii) **SUH PCN or Full address** The Requesting Clinician is required to complete form: PATH-GEN-FRM-3 Declaration form for inadequately labelled samples and correct labelling error in person, within 4 hours of draw, before samples may be processed. Otherwise the bottles will be discarded.
Insufficiently labelled samples	Sample not processed. Report issued stating that two out of three unique identifiers required.	• CSF samples • Blood Culture samples • Unrepeatable samples	
Samples from patients whose details do not correspond with the request form.	Sample not processed. Report issued stating that Different names on form and sample(s) or Incorrect PID or Name stated)	• CSF samples • Blood Culture samples • Unrepeatable samples	The request form and sample should have corresponding details.
Unlabelled / Mislabelled samples	Sample not processed. Report issued stating that unlabelled sample received and This sample deviated from Pathology Labelling Policy. Requesting clinician was contacted by	• CSF samples • Blood Culture samples • Unrepeatable samples	Unrepeatable specimens-refer to sample deviation acceptance policy in Introduction section of this manual. Requesting Clinician is required to complete form: PATH-GEN-FRM-3 Declaration form for inadequately labelled samples and correct

Scenario	Action	Exceptions	Rationale
	the laboratory and informed of requirement to rectify labelling error and complete Declaration Form for Inadequately Labelled Specimens. **Nature of deviation stated ie** Unlabelled samples or Mislabelled samples.		labelling error in person before samples may be processed.
Samples with **no clinical details** or inappropriate clinical details provided on request form (including antibiotic assays)	Sample not processed. Any samples received without accompanying appropriate clinical details will also be rejected with the following comment "*No (or inappropriate)clinical details provided. Sample not processed. Relevant clinical information is necessary in order to allow interpretation of test results. Samples will be held for 48 hours and processed if relevant clinical details are provided"*	• ICU samples • NICU • RDU samples • Haematology/ Oncology patients • Diabetic patients • Any sample that cannot be easily repeated e.g. tissue, CSF, aspirates, blood cultures, BALs, biopsies. • MRSA/VRE screens (including CSU urines from known MRSA carriers) • Consultant Urologist • Pregnancy	Relevant clinical information is necessary in order to allow choice of relevant tests and interpretation of test results. *If clinical information is subsequently provided, this is recorded on the report and the sample is processed.*
Specimens with no requesting doctor or location	Specimen not processed. Rejected with following comment '' '' *No details of requesting doctor given on form. Specimen not processed. ''*		Putting samples up to historic events on the Laboratory Information System (LIS), may breach confidentiality.
Specimen request form does not have a location and location cannot be	Specimen not processed. Rejected with following comment ''No patient		Putting samples up to historic events on the Laboratory

Scenario	Action	Exceptions	Rationale
determined from PCN/requesting doctor.	location details given on form. Specimen not processed.		Information System (LIS), may breach confidentiality.
Old Samples: Samples >48 hours old Or Date of collection not stated on request form or sample	Such samples will not be processed. Samples will be rejected with the comment: "*Specimen >48 hours old. Unsuitable for analysis.* *According to best practice, specimens should be transported and processed as soon as possible. Delays of >48 hours are undesirable and may yield false negative or misleading results. Advise repeat specimen if clinically indicated*."	• Faeces	At this stage target organisms may not have survived and processing such samples may yield false negative or misleading results. Inappropriate antibiotic therapy can result from working up poor quality samples. No information available regarding storage or transport conditions prior to submission to laboratory.
Sample Quality/Quantity: Specimens submitted in a non-sterile or an incorrect container/swab.	Sample not processed. Report issued with comment, specimen received in a non standard non sterile container.	Unrepeatable samples (Samples may be processed with a suitable comment appended to the report)	A non-sterile container may lead to a contaminated sample and misleading results.
Leaking Sample	Sample not processed. Report issued with comment, Leaking sample received unsuitable for analysis.	N/A	A leaking container may lead to a contaminated sample and misleading results.
Insufficient specimen received.	Sample not processed. Report issued with comment, Insufficient specimen for analysis or Small amount of specimen	N/A	N/A

Scenario	Action	Exceptions	Rationale
	received, dried onto a sample stick. Insituable for analysais		
Urines: Catheter specimen urines (CSU)	Unless clinical details on accompanying request form imply systemic infection e.g. pyrexia, sepsis, rigors, vomiting, unwell, pt on IV antibiotics etc samples will not be processed. A report will be issued with the comment "*Clinical details inadequate. Catheter specimen urines will only be processed if clinical details imply systemic infection. Advice repeat specimen if clinically indicated*."	. • ICU/NICU/RDU • Haem/Onc • Diabetic patients • Known MRSA positive patients/MRSA screening • If Catheter was just used to obtain sample i.e. is not a long term indwelling catheter e.g. urinary retention. • Suprapubic catheters • Pre-op samples.	Catheter associated bacteriuria is usually asymptomatic and is not synonymous with clinically significant infection. Submissions of CSU samples are relevant only in cases of systemic infection or for MRSA screening.
Urinary catheter received	Sample not cultured. A report will be issued with a comment stating ''*Urinary catheter tip received. Unsuitable for culture''*		
Penile swab received if urinary catheter in situ	Sample not cultured. A report will be issued with a comment stating ''*specimen not processed for culture. Swab from penile tip is unsuitable for culture in the presence of an indwelling urinary catheter''*		
Urine received for TB culture	Sample not cultured. A report will be issued with a comment stating ''urine *samples not routinely tested for Mycobacterium spp by reference Laboratory.Contact*		

Scenario	Action	Exceptions	Rationale
	Consultant Microbiologist at 071 9171111ext 74162 if renal TB clinically suspected."		
Urines submitted in universal container or blue BD urine sampling container	Sample not processed. Samples will be rejected with one of the following comments: **REJUC** *Sample submitted in universal container. Sample not processed. As per memos of 22/06/15 and 23/07/15, urines received in universal containers will not be processed after 10/8/15. Please submit repeat specimen in appropriate test tube, available on request from the laboratory*. **REJUC2** *Sample submitted in universal container. As per memos of 22/06/15 and 23/07/15, urines received in universal containers will NOT be processed after 10/8/15. Please submit all future specimens in appropriate test tube, available on request from the laboratory.* **REJBLU** *Sample received in blue urine sampling container. A second tube needs to be attached to this blue container and filled with urine as per label on top of blue container. Submit urine samples in this second tube. Please call Microbiology at 071 9174563 to discuss if required.*	Very small volumes	Danger of leakage from universal. A leaking container may lead to a contaminated sample and misleading results. Requirement for urine vacutainer for urinalysis on automated UF

Scenario	Action	Exceptions	Rationale
Urine Microscopy: Manual Microscopy WBC <20 x 10^6/L AND epithelial cells or amorphous deposit present. Automated Cell Count WBC <40 x 10^6/L AND ≥1+ epithelial cells present.	Sample not cultured. A report will be issued with the microscopy result and a comment stating *"Culture not performed on this sample due to low white blood cell count and the presence of epithelial cells/amorphous deposit."*	• Neutropaenic Haem/Onc patients • ICU/NICU/RDU pts • Suprapubic aspirates • Suprapubic catheter • >100 RCC in male patients, elderly females, pregnancy or anybody where there is not a reasonable explanation for a high RCC. • Proteinuria in pregnancy • Pyelonephritis	Majority of such samples cultured yield mixed growth of contaminating organisms (mixed skin flora or mixed enteric organisms)
Field obscured by Amorphous Deposit or Epithelial Cells	Sample not cultured. A report will be issued with the microscopy result and a comment stating *"Poor quality sample as evidenced by large amounts of epithelial cells and/or amorphous deposit……Advise repeat specimen if clinically indicated."*		Culture not performed due to high likelihood of contamination
Automated Cell Count WBC <40 x 10^6/L **AND** no bacteria present.	Sample not cultured. A report will be issued with the microscopy result and a comment stating *"Culture not performed on this sample due to absence/low white cells and absence/low levels of bacterial cells on urine*		Evidence has shown that significant growth does not occur on culture in these instances.

Scenario	Action	Exceptions	Rationale
	cytometry. Evidence has shown that significant growth does not occur on culture in these instances.''		
Faecal samples: (Routine culture) Samples received from in-house patients that have been hospitalised for >3 days	Such samples will not be processed for **routine culture** unless specifically indicated by Infection Prevention and Control. (Existing criteria for Norovirus and *C. difficile* apply). A report will be issued with the comment *"Routine culture not performed as yield of routine enteric pathogens is low in patients that have been hospitalised for > 3 days."* (working days)	N/A	Yield of routine enteric pathogens is low in these instances.
Multiple routine samples with the same collection date	Process one sample only.		For the investigation of enteric pathogens it is more appropriate to collect and submit samples on consecutive days.
Faecal samples: (Ova and Parasites) Samples received with no indication of foreign travel or with no reasonable clinical suspicion of parasitic infection	Sample not processed. A report will be issued with a comment stating *"Screening for ova and parasites will only be carried out in circumstances where a reasonable clinical suspicion of parasitic infection exists e.g. foreign travel. If screening for ova*	N/A	Control of unnecessary Ova and Parasite requests

Scenario	Action	Exceptions	Rationale
	and parasites is required, please contact the Microbiology Department at ext. 4557"		
Faecal samples: ***(C. Difficile)***			
Non-diarrhoeal sample received	Sample not processed	N/A	In accordance with National Guidelines, non-diarrhoeal samples are not tested for C. diff. toxins
Previous positive C. Difficile within 6 days	Sample not processed. Report issued with comment, This patient tested positive for C. Difficile on: (date) Please send repeat sample 6 days post initiation of therapy	N/A	Duplication of work. Send repeat sample 6 days post initiation of therapy as per guidelines.
Faecal samples: (Norovirus)			
Norovirus requests received that have not been discussed with Infection Prevention and Control	Sample not processed. Report issued with comment, Norovirus testing not performed. Please discuss Norovirus request with Infection Protection and Control prior to submitting samples.	Samples received from ED and Assessment Units that have clinical details clearly indicating diarrhoea and vommitting.	Control of Norovirus testing.
Sample received from a confirmed outbreak	Sample not processed. Report issued with comment, Norovirus outbreak already confirmed in this unit. Further samples from this unit will not be processed for Norovirus detection.	N/A	Two positive norovirus cases obtained from a specific outbreak occurrence are required for confirmation of an outbreak. Control of Norovirus testing.

Scenario	Action	Exceptions	Rationale
Sample received from a specific patient on a particular outbreak that has a known negative or positive result.	Sample not processed. Report issued with comment, indicating that a sample has been received that has been previously positive or indicating that a sample has been received that has been previously negative.	Infection prevention and control may ask for a repeat of a negative result.	
Faecal samples: (General) Multiple Requests / Single sample received	Report issued with appropriate comment from below Prioritise C. Difficile or Viral screen over routine culture. Sample processed for one test only.	At the discretion of Infection prevention and control or a senior scientist.	Control of unnecessary requests Mutiple requests , separate samples required Multiple requests: (One sample received), SEPARATE samples required. Multiple requests,(Two samples received) SEPARATE samples required.
MRSA: Screens from community (including nursing homes)	Such samples will not be processed. A report will be issued with the comment *"Sample not processed. MRSA screens from the community will only be processed in the following circumstances: if clinical details indicate patient is for admission to hospital, if clinical details indicate screening is required as part of pre-operative assessment, or if requested by Infection Prevention and Control."*	• If clinical details indicate patient is for admission to hospital • If clinical details indicate screening is required as part of pre-operative assessment • If requested by Infection Prevention and Control	Recommended by SARI Infection Prevention and Control Sub-Committee. The Control and Prevention of MRSA in Hospitals and in the Community. Ireland: Health Protection and Surveillance Centre, 2005.

Scenario	Action	Exceptions	Rationale
Repeat MRSA screens received within 7 days	Such samples will not be processed. A report will be issued with the comment *"Duplicate MRSA screen received within '? days.' Please submit repeat screening swabs at weekly intervals."*	N/A	MRSA protocol.
MRSA: Axilla and/or groin swabs received	Swabs not cultured. Report issued with comment, Axilla and groin swabs are not part of routine MRSA screening procedure in Sligo University Hospital.	If the screen is for another hospital e.g. pre-op patient	Axilla and groin swabs are not part of routine MRSA screening procedure in Sligo University Hospital.
Sputum: Salivary sample received	Sample not processed. Report issued with comment, "Salivary specimen received. Unsuitable for culture".	• ICU • Cystic Fibrosis	Incorrect sample type
Received one sputum sample and requested both TB and routine C&S	Either TB or routine culture is prioritised depending on clinical details. Comment added to report e.g. "*One sputum sample received for routine and TB culture. Separate samples required"* **"***Sample processed for TB Culture only."* **"***Sample processed for routine culture only"*		

Scenario	Action	Exceptions	Rationale
Incorrect Swab type Incorrect swab type received e.g. viral swab for bacterial culture	Sample not processed. Report issued with comment, Incorrect swab type received. Viral swabs are unsuitable for bacterial investigation	N/A	Incorrect swab type

IMPORTANT NOTE

Where there is uncertainty in the identification of the primary sample, and the primary sample is irreplaceable or critical e.g. cerebrospinal fluid, biopsy, blood culture, it is the policy of the Microbiology department to process the sample but not release the results until the requesting physician or person responsible for the primary sample collection takes responsibility for identifying and accepting the sample, or for providing proper information, or all these. The Declaration Form for Inadequately Labelled Samples (PATH-GEN-FRM-3) must be filled out in the laboratory before results can be reported.

13. Requesting Additional Tests

Microbiology Samples: Due to the instability of bacteria over time and the processing undertaken for some samples, it is advisable that requesting additional tests on submitted samples are made as close to date of collection of sample as possible. Please phone relevant section in Laboratory with additional request. Requestor will be advised as to feasibility of carrying out additional tests requests. An additional form/specimen may be required.

Serology Samples: The time limit for testing blood samples for various antibodies / antigens is variable. If additional testing is required by the clinician on a sample previously received, please contact the Serology Laboratory to investigate the feasibility of using the initial specimen for analysis.

14. Out of Hours Referral Testing- Courier Times

Urgent specimens collected overnight can no longer be transported in time to be tested at the reference laboratory the next day. Instead, specimens received after 6 pm will be transported from Sligo using our regular courier service at 10 am the following routine working morning, arriving later that afternoon and tested the day after. This will result in a 24 h delay in turnaround time for these specimens.

15. Storage of Examined Samples

Table 4 Storage of Samples

ID	Specimen Description	Storage Requirement	Storage Location	Minimum Retention Period
1	Serum (In house virology tests)	Aliquot kept below -20°C	Serology freezers, PH & microbiology corridor	2 years
	Serum (Antibiotics, ASO coeliacs and Referral tests)	Primary tube kept at 2^0C – 8^0C	Serology Specimen Fridge, Biochemistry coldroom	7 days
2	Body fluids, aspirates, swabs	2^0C – 8^0C	Microbiology Cold Room	48 hours after release of reports
3	Urine Specimens	2^0C – 8^0C	Microbiology Cold Room	48 hours after release of reports
4	Faeces	2^0C – 8^0C	Microbiology Cold Room	48 hours after release of reports
5	CSF	Aliquot kept at -80^0C	Microbiology -80^0C Freezer	
6	Stained Slides: CSF and Blood Culture films	18^0C – 25^0C for all stained slides	Microbiology Microscopy room	7 days after release of report

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16. Microbiology/Serology tests

A comprehensive detailed list of tests available in Microbiology is outlined in List Of Microbiology Tests And Their Sample Requirements.

The list of Serology tests available are outlined in List Of Serology Tests And Their Requirements.

Each laboratory test will be described under the following headings:

- **Specimen type**
  Where the specimen is blood and the required additive is stated as none, the requirement should be interpreted as a clotted sample.
- **Sample Container**
- **Sample Collection/Preparation**
- **Volume/Quantity**
- **Safety Requirements**
- **Time Between Collection and Processing**
  Any special handling needs between time of collection and time received by the laboratory (transport requirements, refrigeration, warming, immediate delivery, etc.)
- **Sample Quality**
- **Special Requirements**
  The special requirements column defines for each diagnostic test if (applicable) the following:-
  - Patient preparation e.g. fasting
  - Consent form, if applicable.
  - Special timing for collection of samples.
- **Comments**
  Additional information is provided for the user.

17. Repeat Examination due to Analytical Failure

It is the policy of the Pathology department in the event of an analytical failure to:

- Repeat the test using a backup instrument

Or

- Store the specimens in appropriate conditions until the cause of the analytical failure is identified and corrected and then repeat the test.

18. Further Examination of the Primary Specimen

Where further testing is relevant to the investigation or diagnosis of the condition or symptoms which gave rise to the original test request then it is the policy of the Pathology department to pursue a diagnosis by performance of additional tests using the primary specimen.

19. Antimicrobial Testing

SUH reports sensitivity testing of pathogens as

S= Susceptible i.e. this antibiotic is expected to be effective for treatment in this patient.
R= Resistant i.e. this antibiotic is NOT expected to be effective for treatment in this patient.
I = Intermediate i.e. this antibiotic can be effective under certain circumstances. Look for Consultant Microbiologist advice.

20. Tests not Listed

If you require a diagnostic test that is not listed please contact the SUH Microbiology laboratory.

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21. Medical indications and Microbiology test requesting guide

a) Suspected bacteraemia, Systemic Inflammatory Response Syndrome (SIRS), Sepsis, Septic Shock

i. Blood cultures:

For optimum sensitivity, two sets of blood cultures should be collected from separate sites within a 24 h period. These should be taken at least 20 min apart. For patients with suspected endocarditis, three sets should be collected.

ii. Swabs:

Look for a focus of infection and culture those sites appropriate to a suspected focus.

iii. Skin Scrapings:

The sensitivity of this test however is at best 50%, so a NEGATIVE test does NOT exclude disease.

b) CNS infections

i. Blood cultures:

Blood cultures should be collected from all patients with suspected meningitis.

ii. CSF:

CSF should be collected from all adult patients with suspected meningitis except when a clear contraindication exists (e.g. signs of raised intra-cranial pressure, focal neurological signs, severe shock, severely depressed or

fluctuating conscious level, coagulation disorder). Note antimicrobials should **NOT** be withheld pending a lumbar puncture.

iii. Meningococcal and/or Pneumococcal PCR:

Send 5 ml EDTA blood for meningococcal and/or Pneumococcal PCR.

iv. Paired sera:

Paired sera (two specimens taken 10-14 days apart) may be useful for a retrospective diagnosis of meningococcal disease.

c) Respiratory tract infection

i. Tonsillopharyngitis

Throat swab:
Please contact the laboratory if diphtheria or pertussis is suspected.

ii. Sinusitis

Using a syringe aspiration technique, a specially trained physician or an ENT surgeon can obtain material from maxillary, frontal, or other sinuses. Place the contents of the syringe into a sterile universal container.

iii. Otitis media

Send ear swab to the laboratory.

iv. Whooping cough

Nasopharyngeal swab:
Please discuss with laboratory medical staff.

d) Bronchitis

i. Sputum:

A good quality purulent or mucopurulent sputum specimen should be obtained, preferably before antimicrobial therapy.

e) Pneumonia

It is not necessary to perform a full range of microbiological investigations on all patients with community-acquired pneumonia. The extent of investigation should be determined by the severity and clinical course. Specimens that should/may be sent include:

i. Blood cultures:

Blood cultures should be obtained from all patients with moderate to severe Community-Acquired pneumonia (CAP).

ii. Sputum:

A good quality purulent or mucopurulent sputum specimen should be obtained from patients ill enough to require hospital admission or those being treated in the community and not responding to initial antibiotic therapy. Sputum should preferably be collected before antimicrobial therapy although antimicrobial therapy should not be delayed unnecessarily while awaiting a sputum specimen. The specimen should be transported to the laboratory within 2h. Salivary or mucosalivary specimens are unsuitable and are not processed.

iii. Legionella Urinary Antigen:

Urine for Legionella antigen should be obtained from all patients with severe CAP and particular patients with specific risk factors.

iv. Pleural fluid:

If a pleural effusion is present, consider aspiration into a sterile universal container at an early stage.

Bronchoscopic samples may also be required, especially among immunocompromised patients.

Pneumocystis jiroveci: diagnosis of Pneumocystis is carried out on bronchoscopic or induced sputum samples.

Paired sera for legionella should be obtained for all patients who do not respond to β-lactam antibiotics and particular patients with specific risk factors.

f) Gastrointestinal tract infection

Gastroenteritis

Please note that this laboratory employs a cost-effective approach to the diagnosis of infectious diarrhoea. Not all specimens are examined for every pathogen. It is therefore important that clinical details or suspected diagnoses are included on the request form. Information that is of use when processing specimens includes: travel history, relationship to a particular food, prolonged diarrhoea, antibiotic use, suspected outbreak.

i. PCR Testing for Routine examination requests on stool samples from patients who have been in hospital for 3 days or less are examined for:

Note : Bacterial culture is only set-up if the PCR Test is Positive .The Isolate is then sent to a Reference Laboratory for further identification,

- Salmonella spp
- Shigella spp
- E.coli O157
- Campylobacter spp

- Oocysts of Cryptosporidium spp (Parasite is not sent to Reference Laboratory)

Lateral Flow Testing

- Adenovirus and Rotavirus from all patients up to 5 years of age and over 60 years of age.

ii. Additional Requests

- Other pathogens e.g. *Yersinia* spp *Vibrio* spp, *Aeromonas* spp, ova and parasites etc. are only examined if the clinical details suggest that their presence is a possibility.

- ***Clostridium difficile*** toxin detection is performed upon request.

- Please note the possibility of **Norovirus** infection and state whether vomiting is a feature or whether an outbreak is suspected. Norovirus testing will be performed if requested upon consultation with Infection Prevention and Control.

Please send a blood culture if typhoid fever is suspected.

When to send a stool specimen: Send a stool specimen to the laboratory when there are ≥3 liquid or very loose stools per day. There may be other symptoms suggestive of infectious diarrhoea e.g. abdominal pain or discomfort, nausea, faecal urgency, tenesmus, fever, blood or mucus in stools. Within the hospital specimens must be sent to the laboratory immediately. In General Practice, please refrigerate if there is to be a delay in transporting the specimen.

How many samples to send: One stool specimen is normally all that is required for culture. As microscopy for parasites is less sensitive, please send 3 specimens (but no more than 3) on different days as some parasites are excreted intermittently. If a worm is excreted, please send the worm and faeces sample.

Please submit multiple separate faeces samples if **multiple tests** are requested e.g.Culture & C.Diff & Norovirus.

How much to send: Please fill the specimen container to between ¼ and ½ full. Please do not fill to the brim.

iii. Anal swabs:

Anal swabs are collected primarily for the detection of carriage of Vancomycin-Resistant Enterococci (VRE) or for culture for *Neisseria gonorrhoeae*. Insert swab about 2 cm into anal cavity, rotate and send specimen to laboratory.

g) Bone and joint infection

1. Osteomyelitis

i. Blood culture:

Blood cultures should be performed an all patients with suspected osteomyelitis, preferably before antibiotics are started.

ii. Bone biopsy:

A biopsy of bone is the preferred specimen for the establishment of a diagnosis of osteomyelitis and the causative agent. The biopsy should be placed in a sterile universal container with saline and transported to the laboratory as quickly as possible. It is also preferable to send multiple specimens (3 or 4) especially in cases of infection associated with a prosthetic device as this makes interpretation easier if a skin organism is recovered. Consider requesting mycobacterial culture from high-risk groups.

2. Septic arthritis

Blood cultures:

Blood cultures should be performed an all patients with septic arthritis, preferably before antibiotics are started.
Joint aspirate:

A joint aspirate obtained using an aseptic technique should be submitted in a sterile universal container from all patients with septic arthritis.

3. Polyarticular arthritis

Send blood cultures and joint aspirate. Consider sending serum for Lyme disease antibodies. Viral causes also include Parvovirus and Rubella. See MEDICAL INDICATIONS AND SEROLOGY TEST REQUESTING GUIDE for appropriate serology specimens to take.

4. Chronic septic arthritis

Consider requesting serum for antibodies to Brucella, culture of joint aspirate for mycobacteria and fungi.

5. Reactive arthritis

Faeces culture may be requested for *Salmonella* spp*, Shigella* spp*, Campylobacter* spp and *Yersinia* spp.
Send a serum specimen and request antibodies to *Campylobacte*r and *Yersinia*. In rheumatic fever, send a throat swab and serum for ASO titre.

If a sexually transmitted aetiology is suspected then urethral, cervical or rectal swabs may be taken for gonococcal or chlamydial detection.

h) Urinary Tract Infections

When should you send a sample of urine ?

It is probably reasonable to treat a young sexually active female with symptoms of simple cystitis empirically but a urine specimen should be sent for microbiological examination from all other cases. In severe or complicated UTI, a follow-up specimen should be taken 5 days post completion of antibiotic therapy. Persistence of bacteriuria implies a structural abnormality.

A specimen should be sent from patients with symptoms as asymptomatic bacteriuria is generally not a cause for concern except in pregnant women and patients undergoing surgery on the genito-urinary tract. The role of asymptomatic bacteriuria in children is controversial.

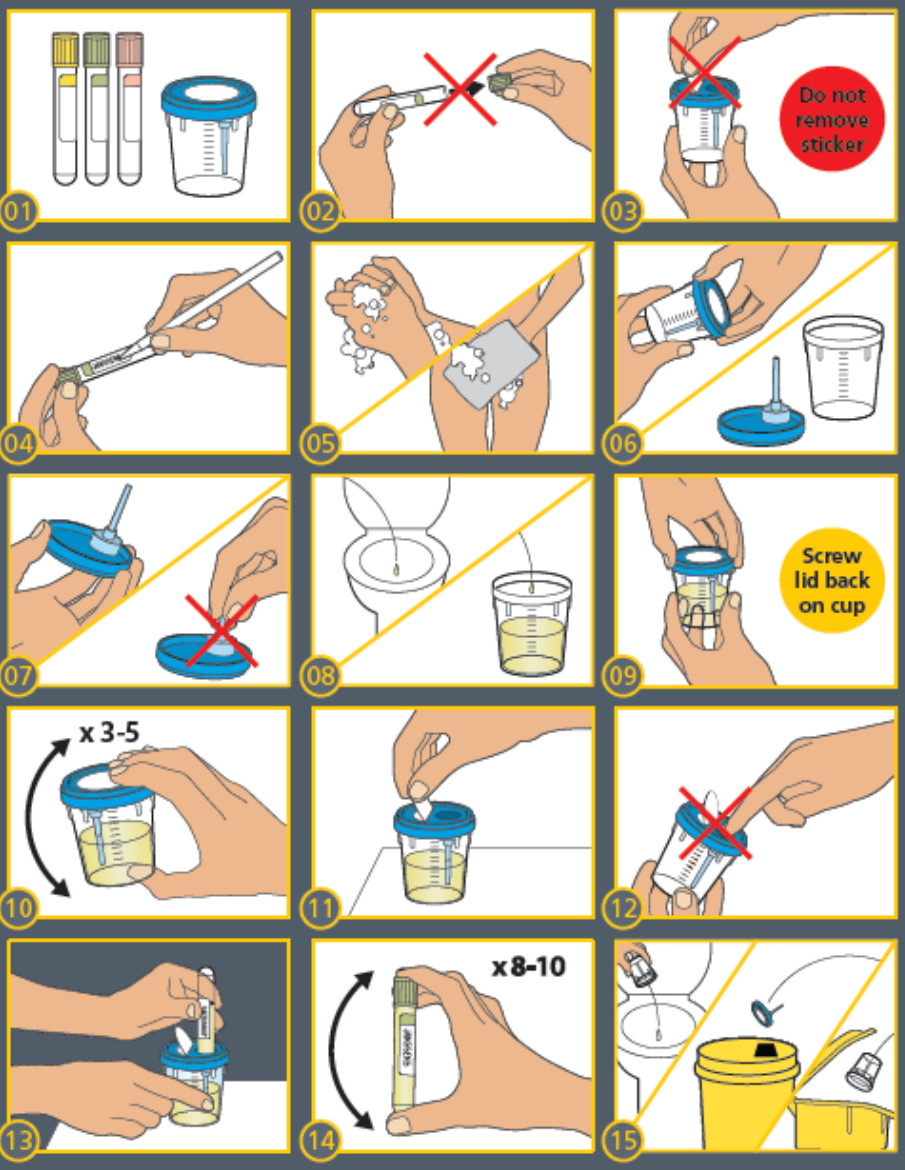
The same applies to patients with in-dwelling urinary catheters. Bacteriuria occurs in the vast majority of patients who are catheterised for more than 5 days, a urine specimen should only be sent if there are symptoms or signs suggestive of a systemic infection.

What type of specimen should you send ?

Send a mid-stream specimen of urine (MSU) where possible.

BD Vacutainer® Urine Collection System
Closed Cup Collection

Instructions for use:



FY14/022

BD
BD Diagnostics
Preanalytical Systems
01865 748844
www.bd.com

Patients should be instructed to pass a little urine into the toilet first, then pass enough urine into the BD Urine Blue topped Cup to half fill it and finish urinating into the toilet. Never obtain urine from a bedpan or commode. Draw about 10 ml of urine into a sterile BD Urine vacutainer tube, and transport to the laboratory without delay. Specimens should be processed within 4 h. In General Practice if transport to the laboratory has to be delayed, the specimen can be stored at 4°C for up to 24 h.

A clean catch urine may also be obtained if the patient cannot co-operate.

A catheter specimen of urine (CSU) may also be sent to the laboratory. Urine should be obtained from an already catheterised patient by a syringe and needle from the catheter before it enters the collection bag. Clean the access point with a swab saturated with 70% isopropyl alcohol, and allow time to dry. Using a sterile syringe and needle (if necessary), aspirate the required amount of urine from the access point. Re-clean access point with a swab saturated with 70% isopropyl alcohol.

i) Skin and superficial wound swabs

Note that routine sampling of skin lesions that do not appear clinically infected should generally not be performed. If there is a clinically infected lesion, please send a sample of pus in a universal container wherever possible. Pus is always preferable to a swab. If there is insufficient specimen, then use a swab, sample the infected area and send to the laboratory.

j) Deep-seated wounds/abscesses/ post-operative wound infection

Please send a sample of pus in a universal container wherever possible. Pus is always preferable to a swab. If there is insufficient specimen, then use a swab, sample the infected area and send to the laboratory. Clean the surface of the wound with sterile saline or water before taking the swab.

k) Mycobacterial Infection

The diagnosis of mycobacterial infection requires special staining and culture techniques. These investigations are currently performed in the microbiology laboratory at University Hospital Galway. Please ensure that you request TB culture on the request form and attach a danger of infection label.

If standard bacteriological culture and sensitivities are required in addition to mycobacterial investigation, a separate specimen is necessary.

Suitable specimens:

- Good quality early morning Sputum x 3
- Specimens obtained at Bronchoscopy
- Pus
- CSF, Pleural, Peritoneal, Joint and other Sterile Fluids
- Tissue
- Lymph node biopsy
- Pus aspirated from lymph nodes
- Pleural biopsy
- Surgical sample for routine culture
- Radiological sample for routine culture
- Histology sample where non-respiratory TB is a possibility
- Aspiration sample where non-respiratoryTB is a possibility
- Bone
- Gastric aspiration
- Blood
- Bone marrow

Unsuitable specimens:

Urine, Specimens of urine for Mycobacteria culture are no longer processed routinely in this laboratory because the yield of positives is negligible and the semi automated culture system is not validated for urine samples. If it is necessary to consider an exception, please contact the medical staff of the Dept of Microbiology,UHG. at 091 542477. The specimen will be stored for 10 days

l) Fungal nail and skin infections

Affected areas should be scraped with a blunt scalpel to harvest affected hairs, broken-off hair stubs and scalp scale. This is preferable to plucking, which may remove uninvolved hairs. Scrapings should be transported in a folded square of paper preferably fastened with a paper clip, but commercial packs are also available (e.g. ‘Mycotrans’). It is easier to see affected hairs on white paper rather than black.

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Medical indications and Serology test requesting guide

For a serological diagnosis, acute (as early as possible in the illness) and convalescent sera (10-14 weeks after onset) may need to be taken for for demonstrating seroconversion or rising titres.
Virus specific Ig M tests may be done on a single specimen of serum for the diagnosis of acute infections for example Hepatitis A. IgM is usually positive 5 days post onset.

N.B. A general request for "Viral screen" or "routine virology" or "atypical screen" can NOT be processed without accompanying clinical information.

The following "Requesting Guide" may assist in identifying possible viruses/agents involved.

* **These specimens/ samples are referred to external laboratory for testing (PTWIP) Phoned to ward if positive and/ or significant**

** **NOTE: If sample needs to be sent to referral Lab for supplemental/ confirmatory testing Turnaround Time will be longer. Days are expressed as Calendar days.**

Provisional Diagnosis/ Symptoms	Tests to be ordered Possible Virus/ Agent/ Disease	Specimen Type
Respiratory Infection URTI and LRTI	*Mycoplasma pneumoniae* *Coxiella burnetti* (Q fever) Chlamydia Group	Serum/ Clotted Blood
	Legionella pneumophilia (Urinary Antigen)	Urine
	Influenza A** Influenza B**	Throat swab in viral transport media
	Respiratory Syncital virus (RSV)* Parainfluenza* Adenovirus*	Nasopharyngeal Aspirate (NPA) or sputum
Arthralgia	Rubella virus* Parvovirus B19* *Mycoplasma pneumoniae* Brucella* *Borrelia burgdorferi* *(Lyme	Serum/ Clotted Blood

Provisional Diagnosis/ Symptoms	Tests to be ordered Possible Virus/ Agent/ Disease	Specimen Type
	Disease) (if clinically suspected)	
Exanthem (Skin Rash)	Measles virus* Rubella virus* Parovirus B19* Antistreptolysin Titre (ASO) *Borrelia burgdorferi* *(Lyme Disease) (if clinically suspected) HIV(if risk factors) Hepatitis B (if risk factors) Dengue *(if risk factors)	Serum/ Clotted Blood Saliva Oral Fluid for Measles only
	Herpes Simplex Virus* (HSV) Varicella Zoster Virus (VZV)	Vesicle Fluid/ Scrapings on Slide
	Enterovirus*	Stool/ Viral Throat Swab
Central Nervous System	Mumps virus*	Serum/ Clotted Blood
	Measles virus*	Serum/ Clotted Blood Nasopharyngeal Aspirate CSG
	Herpes Simplex virus* (HSV) Varicella Zoster virus* (VZV)	Serum/ Clotted Blood or CSF
	Enterovirus*	CSF/ Stool/ Viral Throat Swab/ Pleural Fluid
	Dengue* (if risk factors) West Nile Virus* (if risk factors)	Serum/ Clotted Blood
Hepatitis	Hepatitis A, B, C, D & E Viruses Cytomegalovirus *(CMV) Epstein-Barr Virus*	Serum/ Clotted Blood
Genital infection	Herpes Simplex virus *(HSV)	Viral swab

Provisional Diagnosis/ Symptoms	Tests to be ordered Possible Virus/ Agent/ Disease	Specimen Type
	*Chlamydia trachomatis**	Urine Male uretheral swab Endocervical swab Eye swab
	Syphilis** (*Treponema pallidum)*	Serum/ Clotted Blood
Diarrhoea/Vomiting	Rotavirus Adenovirus Astrovirus* Calicivirus* Norovirus (small round structured virus)	Stool
Intra-Uterine Infection	*Toxoplasma gondi** Cytomegalovirus* Rubella virus* Parvovirus B19* Varicella Zoster Virus* (VZV)	Serum/ Clotted Blood
Organ donors	Hepatitis B & C viruses Human Immunodeficiency Virus (HIV) Cytomegalovirus* (CMV) *Toxoplasma gondii* * Human T-Lymphotropic Virus* (HTLV) Syphilis (*Treponema pallidum*)	Serum/ Clotted Blood
Pleurodynia	Coxsackie Group B viruses*	Stool/ Viral Throat Swab or Pleural Fluid
Pericarditis/ Myocarditis	Coxsackie Group B viruses*	Stool/ Viral Throat Swab or Pleural Fluid
	Coxiella burnetii *(Q Fever) Chlamydia Group* *Mycoplasma pneumoniae**	Serum/ Clotted Blood
Lymphadenopathy & Glandular fever	Monospot Epstein Barr virus* (EBV) Cytomegalovirus *(CMV) *Toxoplasma gondii**	Serum/ Clotted Blood
Paraparesis	Human T-Lymphotropic Virus* (HTLV)	Serum/ Clotted Blood

Provisional Diagnosis/ Symptoms	Tests to be ordered Possible Virus/ Agent/ Disease	Specimen Type
	Enterovirus* (Coxsackie Echo)	Stool
Conjunctivitis	Adenovirus* Herpes Simplex Virus* (HSV) Enterovirus* (Coxsackie Echo)	Eye swab in viral transport media
	Chlamydia trachomatis*	Eye swab in chlamydia transport media
Stomatitis	Herpes Simplex Virus *(HSV) Enterovirus *(Coxsackie Echo)	Swab in viral transport media Serum/ Clotted Blood Stool/ Throat Swab
Hand, Foot and Mouth Disease	Coxsackie A16 Virus*	Stool
Immune Status	Hepatitis A & B virus Varicella Zoster virus *(VZV) Rubella virus Mumps virus * Measles virus * Parvovirus*	Serum/ Clotted Blood

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22. List of Microbiology tests and their Sample requirements

When there is a verbal request from a clinician and specimen volume and age (and appropriateness of request) allow for further testing it is the policy of the department that additional tests are carried out. The request may be referred to laboratory management in order to determine the appropriateness of the request if necessary.

* **These specimens/ samples are referred to external laboratory for testing (PTWIP) Phoned to ward if positive and/ or significant**

** **NOTE: If sample needs to be sent to referral Lab for supplemental/ confirmatory testing Turnaround Time will be longer. Days are expressed as Calendar days.**

Abscess culture

Specimen Type	Pus is always preferable to a swab. If insufficient send a 'Blue top' swab well soaked in pus.
Sample Container	Sterile universal container.  Blue amies agar transport swab. 
Sample Collection/ Preparation	The optimal time of collection is before antimicrobial therapy where possible. Aspirate Pus and transfer into sterile universal container. A closed abscess should be aspirated with a needle and syringe after sterilizing skin with iodine, chlorhexidine preparation or isopropyl alcohol wipes. If Swabs are used: **1.** Remove surface exudate if present by wiping an open abscess with sterile saline or 70% alcohol. **2.** Sample the deepest part of an open abscess trying to avoid the superficial microflora. Sample must be acquired using aseptic technique. Sampling of skin surface area can introduce colonizing bacteria not involved in the infectious process.
Volume/Quantity	A minimum volume of 1ml of pus is required. One specimen is sufficient in the case of all swabs.
Safety Requirements	Ensure the swab is returned fully to the transport medium case and correctly closed. Place in a sealed plastic specimen bag with request form in the pouch, ready for transport to the laboratory.

	Ensure sterile universal containers are leak-proof and closed correctly. Place in a sealed plastic specimen bag with request form in the pouch, ready for transport to the laboratory.
Time Between Collection and Processing	Specimen should arrive in the laboratory within 24hrs of collection. If delivery to the laboratory is delayed, specimens should be refrigerated.
Sample Quality	The volume of the specimen influences the transport time that is acceptable. Larger volumes of purulent material maintain the viability of anaerobes for a longer period of time. The recovery of anaerobes is compromised if the transport time exceeds 3 hours.
Special Requirements	N/A
Turnaround Times	2-5 Days
Comments	• Ideally all samples are processed as soon as possible as the recovery rate of anaerobes is compromised if the transport time exceeds 3 hours due to their susceptibility to air. The volume of specimen influences the transport time that is acceptable. Large volumes of purulent material maintain the viability of anaerobes for longer. • The following specimens when processed receive extended anaerobic culture (5 days). ➢ Specimens with clinical details suggestive of gas gangrene, tetanus, wound botulism and/or Lemiere's Disease/Necrobacillosis ➢ Samples of genuine pus. ➢ Swabs and tissue from severe deep-seated infection. ➢ Fluids/swabs from abscesses of the brain, liver, lung, kidney/psoas abscess, pelvis, pancreas, spine or tonsils. ➢ Bronchial or lung biopsies. ➢ Aspirates from a tubo-ovarian abscess/pelvic abscess and a dental abscess ➢ Pelvic Inflammatory Disease specimens ➢ Any specimen with a specific request for anaerobic culture. • Abscesses are accumulations of pus in the tissues. Any organism isolated may be significant. Abscesses occur in many parts of the body as superficial infections or as deep-seated infections associated with any internal organ. The location of an abscess often determines the flora likely to be isolated. • Recurrent staphylococcal furunculosis is highly infectious and may be the first sign of an underlying disease such as diabetes mellitus. • Aspiration of dental abscesses is necessary to obtain samples containing the likely causative organisms. Swabs are likely to be contaminated with superficial commensal flora.

Main Contents

Acanthamoeba PCR *

Specimen Type	1. Corneal Scrapings in sterile universal container. or 2. Aqueous tap of ocular fluid in sterile universal container. 3. Material from the eye sent to the lab on a dry swab in a sterile universal container
Sample Container	Sterile universal container.
Sample collection/ preparation	Corneal scrapings and intraocular fluids will be collected by an ophthalmic surgeon: sterile needles may be used to aspirate or scrape material, and sterile scalpel blades to scrape material.
Volume/Quantity	As much corneal scraping as possible. A minimum volume of 1ml is required for intraocular fluids and pus exudates.
Safety Requirements	Ensure sterile universal containers are leak-proof and closed correctly. Place in a sealed plastic specimen bag with request form in the pouch, ready for transport to the laboratory. Ensure contact lens containers are leak-proof and closed correctly. Place in a sealed plastic specimen bag with request form in the pouch, ready for transport to the laboratory.
Time Between Collection and Processing	Transport as soon as possible, hold at ambient temperature.
Sample Quality	N/A
Special Requirements	N/A
Turnaround Times	1 Month
Comments	• Referred to external laboratory for PCR.

Bartholins cyst fluid

Specimen Type	Bartholins cyst fluid
Sample Container	Sterile universal container
Sample collection/ preparation	**1**. Disinfect skin with chlorhexidine preparation. **2**. Using a sterile needle and syringe, aspirate fluid from ducts. **3**. Transfer sample into sterile universal container.
Volume/Quantity	5 ml volume (minimum >1ml)
Safety Requirements	Do not submit sample in needle and syringe.
Time Between Collection and Processing	Transfer to the laboratory as quickly as possible, preferably within a few hours of the sample been taken. If delivery to the laboratory is delayed, specimens should be refrigerated.
Sample Quality	The volume of the specimen influences the transport time that is acceptable. Larger volumes of purulent material maintain the viability of anaerobes for a

	longer period of time. The recovery of anaerobes is compromised if the transport time exceeds 3 hours.
Special Requirements	N/A
Turnaround Times	2-4 Days
Comments	

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Biopsy, Tissue, Bone and Prosthetic Devices

Specimen Type	Biopsy, Tissue, Bone and Prosthetic Devices
Sample Container	Sterile universal container **(Do not add formaldehyde, as this will kill any bacteria present)**
Sample collection/ preparation	The optimal time of collection is before antimicrobial therapy where possible. Specimens are collected according to local practice. If sterile saline is used to keep small quantities of tissue moist please indicate on label any additive e.g. 5mls sterile saline.
Volume/Quantity	As large a sample as possible should be sent.
Safety Requirements	Ensure sterile universal containers are leak-proof and closed correctly. Place in a sealed plastic specimen bag with request form in the pouch, ready for transport to the laboratory.
Time Between Collection and Processing	Specimen should arrive in the laboratory as soon as possible after collection. Tissue samples must not dry out; if sample size is small then some drops of sterile saline may be added but this must be indicated on the specimen container. If a delay in transport or processing is anticipated, the specimen should be refrigerated.
Sample Quality	Tissue Samples for Microbiology received in formalin will not be processed.
Special Requirements	N/A
Turnaround Times	2-4 Days
Comments	• Tissue samples for Enterovirus PCR can be done by prior arrangement with the NVRL. SUH microbiology laboratory must be contacted when considering such requests.

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Blood Cultures

Specimen Type	Venous blood is appropriate for most micro-organisms, however, if disseminated fungal infection is suspected than arterial blood may be submitted.		
Sample Container	**Paediatric/Neonate**	**Adult Set**	
	A single paediatric (Bactec Peds Plus) PINK top bottle. 	One Aerobic bottle (BACTEC Plus Aerobic) (Grey top) 	One Anaerobic bottle (Bactec Lytic Anaerobic) (Purple top) 
Sample collection/ preparation	The optimal time of collection is before antimicrobial therapy and as soon as possible after a spike of fever, except in endocarditis where timing is less important. It is essential that great care is taken in the collection of blood for culture to ensure no contaminant is introduced that may be misinterpreted as a significant isolate. Blood for culture should preferably be taken separately; however, if this is not possible or practical, then the blood culture bottles MUST be inoculated BEFORE drawn blood is used to fill any EDTA, Lithium Heparin, or other containers. For optimum sensitivity, **2 sets of blood cultures** should be collected from separate sites. These should be taken at least ≥ 6 hours apart, or if the patient is extremely ill 20-30 minutes apart. Take at least **three sets** during a 24hr period where the patient has suspected infective endocarditis. **1**. Wash and dry hands thoroughly. Carefully remove plastic flip cap from each blood culture bottle and avoid touching the rubber septum. Disinfect the septum with a single wrapped alcohol wipe and allow to air dry.		

	2. Select a suitable venepuncture site. Disinfect the skin at the venepuncture site for 1-2 minutes with a single wrapped alcohol wipe, e.g. Alco wipes (Mediswabs are unsuitable). Allow time for the skin to dry, this will take a few moments and is the process that disinfects the skin. Avoid touching the venepuncture site after disinfection. **3**. Apply clean tourniquet . **4**. To comply with standard precautions, it is recommended to wear disposable gloves during venepuncture. **5**. Insert needle or collection device. **6**. Withdraw required quantity of blood. Release tourniquet and withdraw needle and syringe. Changing needles between venepuncture and inoculation of the bottles is not recommended as this carries the risk of needlestick injury. **7**. Inoculate blood into each bottle through the rubber septum. Mix gently by swirling bottles. **8**. Discard sharps and/or all collection equipment into a sharps bin. Remove gloves and decontaminate hands. • For the diagnosis of bacteraemia withdraw blood from a peripheral vein and divide the sample equally among blood culture bottles. If a central line is present, withdraw blood also from the central line following the recommendations in hospital's Guidelines for Preventing Central Vascular Catheter Related Infection. • Label bottles with patient name and hospital number or use hospital addressograph label. **DO NOT COVER THE BOTTLE BARCODE. THIS IS FOR LABORATORY USE.** • State on bottles and form if blood is from a peripheral vein or a central line. Complete laboratory request form giving a brief relevant history including antibiotic therapy. Complete Microbiology Specimen Request Form (Green), or On-call request form (Red) to ensure compliance with the Patient Specimen and Request Form Identification Criteria. Please supply relevant clinical and antibiotic therapy details. Send bottles and request form to the laboratory for immediate incubation
Volume/Quantity	Paediatric/Neonate 0.5 - 5.0 mls of blood in paediatric bottle (Bactec Peds Plus). Adult 8-10 mls of blood in each bottle (Bactec Plus Aerobic / Bactec Lytic Anaerobic).

	Endocarditis Three sets (Aerobic and Anaerobic) of blood cultures should be taken from separate venepuncture sites.
Safety Requirements	Standard precautions should be adhered to when collecting blood or biological material. Inspect the blood culture bottles for damage or defect before use and that they have not exceeded their expiry date. Gloves should be worn at collection. Do **not** re-sheath needles.
Time Between Collection and Processing	Blood cultures should be transported to the laboratory as soon as possible after collection, for incubation / loading to the BacT Alert 3D system within 4 hours. Where there is a delay in transport to the laboratory or loading onto the blood culture System, blood cultures should be incubated at 36±1°C as soon as possible after inoculation and **MUST NOT** be refrigerated. Pending transportation, store at room temperature.
Sample Quality	N/A
Special Requirements	N/A
Turnaround Times	• Most significant pathogens will be detected within 24-48 hrs; however blood cultures are routinely incubated for 5 days with the exception of endocarditis investigations where incubation is extended to 21 days. • **Positive blood cultures are notified to the ward staff involved immediately on detection by the microbiology/on call staff therefore there is no need for ward staff to contact the Microbiology laboratory to determine if a blood culture is positive.**
Comments	• Most organisms will be detected within 24-48 hrs and normally blood cultures will be incubated for 5 days but this time may be extended to 21 days in some cases e.g. endocarditis. • **Positive blood cultures are notified to the ward involved immediately on detection by the microbiology/on call staff therefore there is no need for ward staff to contact the Microbiology laboratory to determine if a blood culture is positive.** • Blood should NOT be taken through an intravenous catheter or other access device unless no other access is available. An exception to this is the investigation of suspected intravenous catheter related infections, when blood should be sampled from all catheter ports AND from a peripheral vein. • Bottle adaptors must be used with butterfly collections.

Bronchoalveolar Lavage/ Bronchial Washings/ Antral Washout

Specimen Type	Bronchoalveolar Lavage (BAL)/ Bronchial Washings/ Antral Washout
Sample Container	Sterile universal container
Sample collection/ preparation	The optimal time of collection is before antimicrobial therapy where possible. Avoid contaminating bronchoscope with tap water, which may contain environmental Mycobacterium species. Collect specimen according to local practice. Complete the Microbiology Specimen Request Form (green), and specimen container fully to ensure compliance with the Patient Specimen and Request Form Identification Criteria. Please supply relevant clinical and antibiotic therapy details.
Volume/Quantity	Ideally the minimum sample size is 5 ml.
Safety Requirements	Ensure sterile universal containers are leak-proof and closed correctly. Place in a sealed plastic specimen bag with request form in the pouch, ready for transport to the laboratory.
Time Between Collection and Processing	Specimens should be transported to the laboratory as soon as possible. If a delay in transport or processing is anticipated, the specimen should be kept at 4ºC.
Sample Quality	Care should be taken to avoid contamination of sample by upper respiratory tract flora.
Special Requirements	N/A
Turnaround Times	2-4 Days
Comments	Broncho Alveolar Lavage (BAL's) are routinely cultured for bacterial pathogens as well as for Mycobacteria and are referred if indicated for CMV, other viruses and *Pneumocystis jiroveci (carinii*) investigations.

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Catheter Tips (intravenous or intra-arterial)

Specimen Type	CVP or Hickman lines, Central/arterial/portacath/venous tips, Cannula tips.
Sample Container	Sterile universal container
Sample collection/ preparation	1. Disinfect the skin around the cannula entry site according to local protocol. 2. Aseptically remove catheter and clip the 4 cm distal tip of the catheter into a sterile universal container using a sterile scissors.
Volume/Quantity	Distal 4 cms of tip (cut with a sterile scissors)
Safety Requirements	Ensure sterile universal containers are leak-proof and closed correctly. Place in a sealed plastic specimen bag with request form in the pouch, ready for transport to the laboratory.
Time Between Collection and Processing	Transport as soon as possible to prevent drying, store at 2-8^{o}C
Sample Quality	N/A
Special Requirements	N/A
Turnaround Times	2-5 Days
Comments	The culture of Foley (urinary) catheter tips is not clinically useful and they will therefore be rejected. Only send tips from lines that are suspected to be infected (4 cm of tip)

Cerebrospinal fluid (CSF)**

Specimen Type	CSF (Blood cultures should also be collected from all patients with suspected meningitis)
Sample Container	THREE sequentially labelled sterile universal containers. A minimum of one additional sample if requesting Viral studies or any additional tests.
Sample collection/ preparation	1. Sample must be acquired using aseptic technique. 2. Follow protocols outlined by the health care facility for this sample type. 3. Collect CSF sequentially into three or more separate sterile universal containers, which should be numbered consecutively 1, 2, and 3.
Volume/Quantity	Ideally, a minimum volume of 1ml. CSF is normally collected sequentially into three separate containers numbered 1, 2 and 3. All specimens should be submitted to the Microbiology department.
Safety Requirements	Ensure sterile universal containers are leak-proof and closed correctly. Place in a sealed plastic specimen bag with request form in the pouch, ready for transport to the laboratory.
Time Between Collection and Processing	Specimens should be transported to the laboratory for processing as soon as possible. Do **not refrigerate** the specimen.
Sample Quality	Cells in CSF disintegrate and any undue delay may produce a cell count that does not reflect the clinical situation of the patient.
Special Requirements	Treat all CSF specimens as **urgent** and transport to the laboratory immediately. Do **not refrigerate** the specimen. **Do not send CSF samples in the pneumatic tube system (PTS).**
Turnaround Times	Microscopy: 2 hours Culture: 2- 4 Days PCR (In-House) : 2 Hours (BioFire Filmarray Meningitis/Encephalitis panel ^) PCR (Referred) : 2 – 4 Days
Comments	Normal Reference Ranges: Refer to PHE - B27 - Investigation of Cerebrospinal Fluid (CSF) (PATH-MICRO-EXT-93). and PATH-MICRO-LP-13

AGE	WBC/uL	RBC / uL
Neonate (<28 days)	0 - 30	No RBC's should be present in normal CSF
Infants (1-12 months)	0-15	
Children / Adults (>1 Year)	0-5	

Meningitis:

- CSF should be collected from all adult patients with suspected meningitis except when a clear contraindication exists (e.g. signs of raised intra-cranial pressure, focal

	neurological signs, severe shock, severely depressed or fluctuating conscious level, coagulation disorder) or if there is a confident clinical diagnosis of meningococcal infection with a typical rash. • Blood cultures should be collected from all patients with suspected meningitis • Send EDTA blood sample for PCR for meningococcus if this is suspected. • Do not submit samples for microbiological investigation on ice. • Indicate antimicrobial therapy or antifungal therapy on ordering requisition. **Note**: Antimicrobials should NOT be withheld pending a lumbar puncture. Viral Studies: • Samples being submitted for viral cultures only should be held/stored at 4°C. • Isolation of an enterovirus (Coxsackie virus, Echovirus) from the CSF is most productive within 2-3 days after onset of the CNS manifestations. • If viral meningitis or encephalitis is suspected it is advisable to collect faeces and a viral throat swab in addition to CSF. This would increase the possibility of detecting the aetiological agent. The uncertainty associated with CSF cell counts, is available to service users if required, and is available on the Q Pulse system. This record is PATH-MICRO-REC-167. ^ = For the full range of organisms detected by PCR in SUH, refer to **PATH-MICRO-REC-278** Guide to PCR Testing in SUH.

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Corneal Scrapings

Specimen Type	Corneal Scrapings.
Sample Container	Direct culture at bedside using blood agar, chocolate agar and saboraud agar for fungal culture is the preferred option. Slides of sample should also be prepared. Contact microbiology to receive 'Corneal scrapings culture pack'. Sterile Universal Container.
Sample collection/ preparation	Use a sterile needle to scrape material from the cornea. Collect material into a sterile universal container or inoculate the material directly onto the agar plates. The scrapings should be inoculated onto the surface of the agar plates only and not into the agar. Follow the written procedure received with the 'Corneal scrapings culture pack'. Prepare a smear by sandwiching the remainder of the material between two clean glass microscope slides. Write patient name on correct slide face. If Amoebic Keratitis is suspected then Acantamoeba PCR should be considered.
Volume/Quantity	Corneal scrapings should be of sufficient quantity to make two smears and to inoculate culture plates. If there is insufficient specimen, culture takes priority.
Safety Requirements	Ensure that agar plates inoculated with corneal scrapings are sealed and labelled. Ensure the smears are placed in a slide holder. Place the agar plates and smears in a sealed plastic specimen bag with request form in the pouch, ready for transport to the laboratory. Ensure sterile universal containers are leak-proof and closed correctly. Place in a sealed plastic specimen bag with request form in the pouch, ready for transport to the laboratory.
Time Between Collection and Processing	Specimen should be sent to the laboratory immediately. If processing is delayed, store at 2-8°C and dispatch to lab as soon as possible.
Sample Quality	N/A
Special Requirements	If specimens for the investigation of Acanthamoeba sp. cannot be processed within 8 hours, it is preferable to store them at room temperature.
Turnaround Times	7-9 Days
Comments	

Main Contents

Eye Swabs

Specimen Type	Eye swab - any available pus is sampled as well as the lesion of interest.
Sample Container	Blue amies agar transport swab.
Sample collection/ preparation	Retract the lower eyelid and stroke the tarsal conjunctiva with a transport swab and remove all purulent material.
Volume/Quantity	One specimen is sufficient in the case of all swabs.
Safety Requirements	Ensure the swab is returned fully to the transport medium case and correctly closed. Place in a sealed plastic specimen bag with request form in the pouch, ready for transport to the laboratory.
Time Between Collection and Processing	Specimen should arrive in the laboratory within 24hrs of collection. If processing is delayed, store at 2-8°C and dispatch to lab as soon as possible.
Sample Quality	N/A
Special Requirements	N/A
Turnaround Times	2-5 Days
Comments	Indicate antimicrobial therapy on ordering requisition. Separate swabs in appropriate transport media are needed for the diagnosis of viral and Chlamydia infections. If Chlamydia infection is suspected, please contact Serology laboratory beforehand to obtain chlamydial transport swab. Break the swab into this medium and replace top.

Main Contents

Faeces

Faeces - Routine

Specimen Type	Faeces – Routine culture (*Salmonella, Shigella*, *Campylobacter* and *E. coli* O157:H7); Adenovirus/Rotavirus* & Cryptosporidium. Faecal Occult Blood (FOB).
Sample Container	Sterile Universal Container.
Sample collection/ preparation	Collect specimen as soon as possible after onset of symptoms. Specimen may be passed into a clean, dry, disposable bedpan or similar container and transferred into a sterile container (see above) using the spoon. The specimen is unsatisfactory if there remains any residual soap, detergent or disinfectant in the pan.
Volume/Quantity	1-2g (spoonful) is sufficient. If more than one specimen is received on the same day, only one specimen per patient per day will be processed.Please submit multiple separate faeces samples if multiple tests are requested e.g.Culture & C.Diff & Norovirus
Safety Requirements	Please do not fill to the brim. Ensure that the lid of the container is firmly closed. Ensure sterile universal containers are leak-proof and closed correctly. Place in a sealed plastic specimen bag with request form in the pouch, ready for transport to the laboratory.
Time Between Collection and Processing	Stool specimens should arrive in the laboratory as soon as possible. If a delay is unavoidable, specimen should be refrigerated in a designated refrigerator or in a designated part of a refrigerator not close to medicines or food. New Molecular testing methods allow the issuing of negative reports on the same working day. Samples must be received in the microbiology laboratory by 9.30 am in order to be processed on the same day e.g. EntericBio PCR Testing.
Sample Quality	Testing will only be performed on diarrhoeal stool. The stool specimen must take the shape of the container.
Special Requirements	When to send a stool specimen: Send a stool specimen to the laboratory when there are ≥3 liquid or very loose stools per day. There may be other symptoms suggestive of infectious diarrhoea e.g. abdominal pain or discomfort, nausea, faecal urgency, tenesmus, fever, blood or mucus in stools.
Turnaround Times	Molecular method allows same day results. For week-ends and Bank Holidays when the routine workflow is disrupted, please allow 1-3 working days for results.
Comments	• From October 11th, 2021 the Dept. of Microbiology moved from a culture-based method for the detection of enteric pathogens in faecal specimens to a molecular platform: EntericBio realtime PCR. • The EntericBio system employed in SUH is a molecular, automated platform for the detection of enteric pathogens directly from stool samples. The test targets Salmonella spp, Shigella spp, Campylobacter spp, Cryptosporidium spp, Giardia spp and Verotoxin-producing E.coli (VTEC) in a PCR assay.

- The assay will increase detection rates for the 6 main enteric pathogens, particularly VTEC.
- Negative results will be reported as "No target DNA Detected"
- Positive findings will be reported as follows:

Salmonella enterica spp	Salmonella enterica spp DNA detected
Shigella spp	Shigella spp DNA detected
Verotoxigenic E. coli	Verotoxigenic E. coli DNA detected
Campylobacter spp	Campylobacter spp DNA detected.
Cryptosporidium spp	Cryptosporidium spp DNA detected
Giardia spp	Giardia lamblia DNA detected

- Culture for confirmatory and epidemiological purposes will be performed on samples in which Salmonella spp or Shigella spp DNA is detected. If a viable organism is recovered, the isolate will be sent to the National Salmonella Reference Laboratory for speciation and susceptibility testing.
- Occasionally the organism will not grow on culture as it may not be viable but the system will still detect small amounts of DNA. In these cases, we will issue the report as NOT ISOLATED.
- If VTEC DNA is detected, the stool sample will be sent directly to Cherry Orchard Public Health Laboratory for full investigation.
- The Molecular system is not designed for tests of clearance of carriage. If this is required, it must be indicated on the request form or communicated to the Clinical Microbiology Team.
- Please note that this laboratory employs a cost-effective approach to the diagnosis of infectious diarrhoea. Not all specimens are examined for every pathogen. It is therefore important that clinical details or suspected diagnoses are included on the request form. Information that is of use when processing specimens includes: travel history, relationship to a particular food, prolonged diarrhoea, antibiotic use, suspected outbreak.
- Other enteric pathogens e.g. *Yersinia* spp*, Vibrio* spp*, Aeromonas* spp, ova and parasites etc. are only examined if the clinical details suggest that possibility.
- Bloody or liquid stools collected within 6 days of onset from patients with abdominal cramps have the highest yield for culture positive *E. coli* O157.
- Culture for Enteropathogenic *E. coli* is no longer available in-house.
- Adenovirus/ Rotavirus testing is routinely only performed on faeces from children ≤2 years and adults ≥ 70 years old.

Faeces - *C. difficile* Toxin Assay

Specimen Type	Faeces
Sample Container	Sterile Universal Container.
Sample collection/ preparation	Collect specimen as soon as possible after onset of symptoms. Specimen may be passed into a clean, dry, disposable bedpan or similar container and transferred into a sterile container (see above) using the spoon. The specimen is unsatisfactory if there remains any residual soap, detergent or disinfectant in the pan.
Volume/Quantity	1-2g (spoonful) is sufficient. No more than 3 consecutive negative stools from different days will be tested on a single patient.
Safety Requirements	Ensure sterile universal containers are leak-proof and closed correctly. Place in a sealed plastic specimen bag with request form in the pouch, ready for transport to the laboratory.
Time Between Collection and Processing	Stool specimens should arrive in the laboratory as soon as possible.
Sample Quality	Formed stool will not be tested unless there is an indication that the patient has toxic megacolon.
Special Requirements	N/A
Turnaround Times	24 hours (working day) For week-ends and Bank Holidays when the routine workflow is disrupted, please allow 1-3 working days for results.
Comments	Sligo University Hospital Infection Prevention and Control will be notified of a positive result.

Main Contents

Faeces – Norovirus Testing

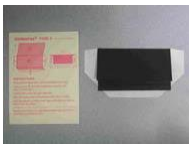
Specimen Type	Faeces
Sample Container	Sterile Universal Container.
Sample collection/ preparation	Collect specimen 3-5 days after onset of symptoms. Specimen may be passed into a clean, dry, disposable bedpan or similar container and transferred into a sterile container (see above) using the spoon. The specimen is unsatisfactory if there remains any residual soap, detergent or disinfectant in the pan.
Volume/Quantity	1-2g (spoonful) is sufficient. If more than one specimen is received on the same day, only one specimen per patient per day is to be processed.
Safety Requirements	Ensure sterile universal containers are leak-proof and closed correctly. Place in a sealed plastic specimen bag with request form in the pouch, ready for transport to the laboratory.
Time Between Collection and Processing	Stool specimens should arrive in the laboratory as soon as possible. If a delay is unavoidable, specimen should be refrigerated in a designated refrigerator or in a designated part of a refrigerator not close to medicines or food.
Sample Quality	N/A
Special Requirements	N/A
Turnaround Times	24 hours (working day) For week-ends and Bank Holidays when the routine workflow is disrupted, please allow 1-3 working days for results.
Comments	• **Norovirus requests are processed upon request after direct consultation of the ward with Infection Prevention and Control.** • State whether vomiting is a feature or whether an outbreak is suspected. • Non diarrhoeal samples are rejected.

Main_Contents

Fluids

Specimen Type	Fluids (Includes all aseptically obtained fluids such as: abdominal, amniotic, ascites, bile, joint, paracentesis, pericardial, peritoneal, pleural, synovial, continuous ambulatory peritoneal dialysis fluid (CAPD) and thoracentesis)
Sample Container	Sterile Universal Container.  If a cell count is required on fluids other than CAPD a portion of the fluid specimen should be collected into an EDTA purple top tube. 
Sample collection/ preparation	Sterile fluid specimens are collected by aseptic percutaneous aspiration or at surgery and transported in a clean, sterile container. For CAPD the complete dialysate bag should be sent or a minimum of 50 mls of CAPD in a sterile 250 ml. container.
Volume/Quantity	A minimum volume of 1 ml of fluids and 50 ml of CAPD is required. The yield is increased if >10 ml of fluid is collected.
Safety Requirements	Wear sterile gloves, and dispose of sharps into sharps container. Do not re-sheath needles. If the patient is suspected of having T.B. wear appropriate PPE as identified by local risk assessment during collection and discard any waste material into clinical waste bags. Ensure sterile universal containers are leak-proof and closed correctly. Place in a sealed plastic specimen bag with request form in the pouch, ready for transport to the laboratory.
Time Between Collection and Processing	Specimens should be transported to the laboratory as soon as possible. If a delay in transport or processing is anticipated, the specimen should be kept at 4ºC.
Sample Quality	Delays of 3 hours or more will greatly diminish the recovery of anaerobic organisms.
Special Requirements	N/A
Turnaround Times	2-4 Days
Comments	Always submit as much fluid as possible, do not submit a swab dipped in fluid.

Fungal (Mycology) Culture

Specimen Type	Superficial Infection * Skin scrapings, Nail clippings, Hair follicles. Systemic Infection Pus/aspirate, Tissue/Biopsy, BAL/Sputum, CSF, Blood Culture, Bone Marrow, Ear Swab or other.	
Sample Container	Superficial Infection Dermapak Type 3 or equivalent 	or Sterile Universal Container 
	Systemic Infection Sterile universal container or Minitip Amies agar transport swab for ear swabs or blood culture bottles for blood cultures.	
Sample collection/ preparation	Superficial Infection* Skin scrapings: 1) Clean the lesion area with 70% alcohol to reduce bacterial contamination. 2) Allow time for the alcohol to dry. 3) Using a blunt scalpel scrape scales of skin, preferable 2-3mm diameter, outwards from the active periphery of the lesion. 4) Snip off domes of any skin vesicles. Nail clippings: 1) Take scrapings from any discoloured, dystrophic or brittle parts of the nail using a scalpel. Discard the most superficial samples. 2) Sample some of the friable material under the nail. Hair follicles/Scalp specimen: 1) Scalp specimen is best obtained by scraping with a blunt scalpel. The contents should include hair stubs, the contents of plugged follicles and skin scales. 2) Hair may be plucked from the scalp with fine forceps. 3) Cut hairs are unsuitable for fungal culture as the focus of infection is below or near the surface of the scalp	

	Systemic Infection Pus/aspirate, Tissue/Biopsy, BAL/Sputum, CSF, Blood Culture, Bone Marrow, Ear Swab. Refer to individual test for collection details.
Volume/Quantity	Superficial Infection One specimen is sufficient for skin scrapings, nail and hair specimen. Systemic Infection Pus/aspirate, Tissue/Biopsy, BAL/Sputum, CSF, Blood Culture, Bone Marrow, Ear Swab or other. Refer to individual test for volume quantity.
Safety Requirements	Ensure the Mycotrans or Dermapak envelope or equivalent is closed correctly. Place in a sealed plastic specimen bag with request form in the pouch, ready for transport to the laboratory. Ensure the swab is returned fully to the transport medium case and correctly closed. Place in a sealed plastic specimen bag with request form in the pouch, ready for transport to the laboratory. Ensure sterile universal containers are leak-proof and closed correctly. Place in a sealed plastic specimen bag with request form in the pouch, ready for transport to the laboratory.
Time Between Collection and Processing	Specimen should arrive in the laboratory as soon as possible after collection. If processing is delayed, store at room temperature and dispatch to the lab as soon as possible.
Sample Quality	N/A
Special Requirements	N/A
Turnaround Times	7-9 Days
Comments	• Specimens are collected at onset of symptoms, and before antifungal therapy, where possible. Sufficient volume of pus/tissue/biopsy/other in sterile container transported directly to the laboratory. Specimens for subcutaneous mycological investigation are processed as soon as possible after collection. • Indicate any recent antifungal therapy.

Genital Tract Swabs

Specimen Type	High Vaginal, Cervical, Urethral, Vulval.
Sample Container	Blue amies agar transport swab  Orange minitip amies agar transport swab (for male urethral) 
Sample collection/ preparation	Cervical and high vaginal swabs should be taken with the aid of a speculum. It is important to avoid vulval contamination of the swab. For *Trichomonas vaginalis*, the posterior fornix, including any obvious candidal plaques should be swabbed. If pelvic infection, including gonorrhoea, is suspected, the cervical os should be swabbed. Vaginal specimens: After the introduction of the speculum, the swab should be rolled firmly over the surface of the vaginal vault. For *Trichomonas vaginalis*, the posterior fornix, including any obvious plaques should be swabbed. Cervical specimens: After the introduction of the speculum, the swab should be rotated inside the endocervix. Urethral specimens Contamination with microorganisms from the vulva or the foreskin should be avoided. For male urethra, if a discharge is not apparent, attempts should be made to “milk” exudates from the penis. The patient should not have passed urine for at least 1 hour. The minitip amies swab is recommended for male urethral sampling. The swab is gently passed through the urethral meatus and rotated. Vulval specimens are taken from the vulva. After collection, swabs should be placed in a non-nutrient Transport Medium such as Amies or Stuart.
Volume/Quantity	One specimen is sufficient in the case of all swabs. Where more than one specimen is received without differentiation, it will be processed as a single specimen.
Safety Requirements	Ensure the swab is returned fully to the transport medium case and correctly closed. Place in a sealed plastic specimen bag with request form in the pouch, ready for transport to the laboratory.
Time Between Collection and Processing	All swabs should be sent to the laboratory as quickly as possible, preferably within a few hours of the sample been taken.
Sample Quality	Delays of 24 hours or more will greatly diminish the recovery of *Neisseria gonorrhoeae*. If delay is unavoidable a direct smear is made for Gram staining. Write name and date on slide. The smear is allowed to air dry and placed in a slide holder for transport to the laboratory The yield of *Trichomonas vaginalis* is significantly diminished if not examined on the day of collection.
Special Requirements	If delivery to the laboratory is delayed, specimens should be refrigerated.
Turnaround Times	2-4 Days

Comments	• A range of sexually transmissible organisms cause infections responsible for a large number of clinical syndromes. When a specific STI is diagnosed, it is recommended to screen for other infections. Screening has a role in helping to control gonorrhoea, syphilis, chlamydial infection, and human immunodeficiency virus (HIV) infection • Bacterial Vaginosis (BV) is now considered to be associated with a variety of genital tract infections and complications. BV may be diagnosed clinically if three of the following four criteria are fulfilled: o Grey-white, thin homogenous discharge o Vaginal secretions pH > 4.5 o Positive amine odour test (release of fishy amine odour when vaginal secretion is mixed with 5-10% potassium hydroxide) o Presence of clue cells on microscopic examination Changes to our testing and reporting policy effective from 3rd February, 2020. In line with best practice, investigation for Neisseria gonorrhoea in female patients will be carried out on endocervical swabs only. This is the specimen of choice for isolation of Neisseria gonorrhoea. Gram staining of vaginal swabs will be carried out only when bacterial vaginosis is specifically requested or if clinically indicated. Gram staining of male urethral swabs will continue to be carried out on Genito urinary medicine (GUM) specimens and specimens where STI is being investigated. The specimen of choice for investigation of balanitis is a swab from the balanoprepucial groove. Urethral swabs querying balanitis will not be processed and will be reported with a comment requesting submission of a swab from balanoprepucial groove. These changes are in line with current international recommendations (Reference: Public Health England 2017. UK Standards for Microbiology Investigations (Investigation of Genital Tract and Associated Specimens) B 28 Issue 4.6)

MONKEY POX / MPOX

Specimen Type	Refer to the Interim Mpox (MPXV CLADE I & II) ASSESSMENT AND TESTING PATHWAY FOR ADULTS IN ACUTE SETTINGS AND HIV/STI/ID CLINICS • Viral Swab in UTM
Sample Container	UTM media
Sample collection/ preparation	• Notify Public Health (087-9537807) for sampling approval of Lesion fluid, scabs, crusts or throat swab. • If approved by PH, Alert the Laboratory in advance of sampling. • Wear appropriate PPE
Volume/Quantity	Refer to most recent HPSC Guidelines
Safety Requirements	• Double Bag samples and DO NOT submit by laboratory chute. Laboratory attendants must hand deliver to the laboratory. •
Time Between Collection and Processing	Refer to most recent HPSC Guidelines Interim Mpox (MPXV CLADE I & II) ASSESSMENT AND TESTING PATHWAY FOR ADULTS IN ACUTE SETTINGS AND HIV/STI/ID CLINICS
Sample Quality	Refer to most recent HPSC Guidelines
Special Requirements	The Biomnis courier to the NVRL will require Category B Transportation
Turnaround Times	The samples are referred to the National Virus Referral Laboratory (NVRL). The NVRL will contact the Consultant Microbiologist with results
Comments	Public Health are informed of results All waste is handled as Category B waste Sample will also be tested for Varicella and Herpes Simplex Virus.

Mycobacterium Staining and Culture *

Specimen Type	Specimen type depends on clinical presentation. Refer to Comments section below. e.g. Sputum, BAL, Pus, CSF, Fluids, Tissue/Biopsy, Bone, Bone Marrow, Early Morning Urine (EMU).
Sample Container	Sterile universal container.
Sample collection/ preparation	Refer to individual test list for information on collection details. Refer to protocols outlined by your health care facility for these sample types. If the patient is suspected of having T.B. wear appropriate PPE as identified by local risk assessment during collection and discard any waste material into clinical waste bags.
Volume/Quantity	Sputum Three early morning specimens. Ideally a minimum voume of 5ml of sputum. Pus As much pus as possible. Other Body Fluids As available. Ideally 10 ml of fluid from normally sterile sites including CSF.
Safety Requirements	Collection of samples such as respiratory samples should be performed in negative pressure isolation areas wherever drug resistant mycobacterium is suspected. If the patient is suspected of having T.B. wear appropriate PPE as identified by local risk assessment during collection and discard any waste material into clinical waste bags. Ensure sterile universal containers are leak-proof and closed correctly. Place in a sealed plastic specimen bag with request form in the pouch, ready for transport to the laboratory.
Time Between Collection and Processing	Specimens should be transported to the laboratory as soon as possible. If a delay in transport or processing is anticipated, the specimen should be refrigerated.
Sample Quality	Sputum Salivary or muco-salivary sputum specimens may give misleading results, as these specimens will be contaminated by normal mouth flora. These specimens may be rejected by the Laboratory. Sputum specimens for routine bacteriological examination, which are greater than 24hours old, diminish the quality of the specimen.
Special Requirements	N/A
Turnaround Times	Samples are sent out to Galway University Hospital for testing. Microscopy: 1-2 days Culture: 6 to 7 weeks
Comments	The following is a list of suitable specimens to submit. Please note that respiratory specimens are the specimens of choice for patients with suspected pulmonary TB. • Good quality purulent early morning sputum. Three consecutive early morning specimens (2-5ml) should be submitted before the commencement of therapy. The specimen should be coughed from deep within the lungs. Poor quality sputum

	specimen's e.g. salivary specimens or specimens of minute quantities are not suitable. • Specimens obtained at Bronchoscopy • Pus • CSF, Pleural, Peritoneal, Joint and other Sterile Fluids Tissue/Biopsy without fixative. • Bone • Gastric aspiration (in children from whom sputum cannot be obtained) • Blood (7-10 ml inoculated in a Bactec MYCO/F LYTIC blood culture bottle) • Bone marrow (> 0.5 ml inoculated directly into a Bactec MYCO/F LYTIC bottle) • Specimens of urine for Mycobacteria culture are no longer processed routinely in this laboratory because the yield of positives is negligible and the semi automated culture system is not validated for urine samples. If it is necessary to consider an exception, please contact the medical staff of the Dept of Microbiology,UHG. at 091 542477. The specimen will be stored for 10 days. • Faeces is NOT a suitable sample for TB culture.

Main Contents

Parasites, Ova, and Cysts *

Specimen Type	*Faeces, Duodenal and Jejunal Aspirates,* Urine for *Schistosoma haematobium, moist COTTON TIP swab.*
Sample Container	Sterile universal container. 24 hour urine container without boric acid.
Sample collection/ preparation	**Faeces** Specimen may be passed into a clean, dry, disposable bedpan or similar container and transferred into a sterile universal container. The specimen is unsatisfactory if there remains any residual soap, detergent or disinfectant in the pan. **Duodenal and jejunal aspirates** Specimens will be obtained by specialist collection according to local protocols and sent to the laboratory in a sterile universal container. **Swab for Enterobius vermicularis** Moisten a plain COTTON TIP SWAB with saline or water. In the morning, after waking but before bathing or using the toilet, spread the buttocks apart. Press the swab against the skin around the anal opening and the surrounding folds. You can also gently insert the swab about 0.5 cm into the anus for a moment. Do not insert the swab too deeply. For best results, it is recommended to collect samples on three consecutive mornings before ruling out a pinworm infection. Submit swab immediately to Laboratory in a securely sealed UNIVERSAL CONTAINER. ***Urine for Schistosoma haematobium*** The number of ova in the urine varies throughout the day, being highest in urine obtained between 10h 00 and 14h 00. The specimen should be collected between these times and consist of a single, terminal urine of at least 10 ml. Alternatively a 24-hour collection of terminal urine can be made.
Volume/Quantity	Faeces 1-2g (spoonful) is sufficient for ova and parasites. If more than one specimen is received on the same day only one will be processed, as shedding of ova and cysts can be intermittent. Three stool samples from separate days is recommended. Duodenal and jejunal aspirates Single aspirate is sufficient. Swab for *Enterobius vermicularis* ova It is recommended to collect samples on three consecutive mornings before ruling out a pinworm infection.

	Urine for *Schistosoma haematobium* A minimum volume of 10ml is required.
Safety Requirements	Ensure sterile universal containers are leak-proof and closed correctly. Place in a sealed plastic specimen bag with request form in the pouch, ready for transport to the laboratory.
Time Between Collection and Processing	Specimens should be transported to the laboratory as soon as possible.
Sample Quality	Urine for *Schistosoma haematobium* If the urine must stand for an hour or longer, add 1ml of undiluted formalin (37% formaldehyde solution) to each 100ml of urine. This will preserve any eggs that might be present.
Special Requirements	Request form data should include all clinical details and in particular stating if the patient has a: • History of foreign travel • Abdominal pain with eosinophilia • Prolonged or chronic diarrhoea • Immunocompromised Failure to supply relevant details with requests for ova and parasites may result in the specimen not been processed.
Turnaround Times	1 week
Comments	N/A

Main Contents

Quantiferon Test *

Specimen Type	Blood
Sample Container	QuantiFERON®-TB Gold Plus - (QFT®-Plus) Blood Collection Tubes These are only available from the Microbiology laboratory, and needs to have the appropriate Mater Hospital Request Form provided when picked up from the laboratory.
Sample collection/ preparation	Collect blood by venepuncture.  Fill in patient details on sample tubes- LABELS SHOULD BE **PLACED CORRECTLY** ON SAMPLE TUBES AND SHOULD NOT COVER THE **'FILL LEVEL'** Collect 1 mL into each tube in the following order: **Grey, Green, Yellow, Purple** ***DO NOT OVERFILL*** Hold tube on needle for 2-3 seconds after flow ceases. Repeat tube if not close to black fill line. Butterfly needles: prime tubing with a "purge" tube before filling Immediately after filling tubes, shake tubes 10 times, just firmly enough to ensure entire Inner surface of tube is coated with blood, to dissolve antigens on tube wall. Caution: over-energetic shaking may cause gel disruption and could lead to aberrant results. Complete the **Mater Hospital request form** (MF-MIC-55) including date & time taken and clinical details
Volume/Quantity	Vacuum fills to 1 ml (black mark is acceptable 0.8–1.2 ml range)
Safety Requirements	Standard blood handling precautions apply.
Time Between Collection and Processing	Blood must be incubated upright as soon as possible (and within 16 hours of collection).
Sample Quality	Over-energetic shaking may cause gel disruption and could lead to aberrant results.
Special Requirements	Immediately after filling tubes, shake them ten (10) times, just firmly enough to ensure the entire inner surface of the tube is coated with blood, to dissolve antigens on tube walls.
Turnaround Times	1 week if received before 8 am on a Thursday. The test is carried out on Fridays in Mater Hospital.
Comments	Sample processed in Mater Hospital laboratory. Phone the Mater 01 803 2021 in case of any problems. Interpretation of QFT-G results is based on IFN-gamma concentrations in test samples. Each QFT-G result and its interpretation should be considered in conjunction with other epidemiological, historical, physical, and diagnostic findings. A positive result suggests that M. tuberculosis infection is likely; a negative result suggests that infection is unlikely; and indeterminate result suggests QFT-G results cannot be interpreted as a result of low mitogen response or high background response.

	A diagnosis of LTBI requires that TB disease be excluded by medical evaluation, which should include checking for signs and symptoms suggestive of TB disease, a chest radiograph, and, when indicated, examination of sputum or other clinical samples for the presence of M. tuberculosis.

Screening Swabs

CRE Screen

Specimen Type	Rectal swabs/stoma swabs or swabs from faecal samples
Sample Container	Collect specimens in appropriate CE marked leak proof containers and transport in sealed plastic bags.
Sample collection/ preparation	Screening refers to • The collection of a rectal swab or sample of faeces. • The swab/sample should be submitted within 24 hours of the patientpresenting to the hospital. • Collection of rectal swabs, rather than waiting for stool samples, lendsitself to prompt sample collection and is generally preferred. • If rectal swab sampling is not acceptable to a patient, stool samples areacceptable. After collection, swabs should be placed in a non-nutrient Transport Medium such as Amies or Stuart.
Volume/Quantity	Four consecutive samples taken at intervals of not less than one week
Safety Requirements	In the acute hospital setting Standard Precautions and Contact Precautions should apply to any contact of a patient colonised with CPE.
Time Between Collection and Processing	Standard and Contact Precautions should be applied until a minimum of four consecutive samples taken at intervals of not less than one week have been tested by an appropriate method and reported as, “CPE not detected” or “CPE negative”. The final sample from a contact should be taken at least four weeks after the most recent contact. It is accepted that a small number of patients may become detectable as CPE positive more than four weeks after contact with a CPE positive patient but it is felt necessary at this time to apply a pragmatic time limit to the process.
Sample Quality	There should be visible faecal material on the rectal or peri-rectal swabs taken. Specimens should be transported and processed as soon as possible. If processing is delayed, refrigeration is preferable to storage at ambient temperature.
Special Requirements	Retesting of patients confirmed positive for CPE is generally not necessary at Present.This is because an agreed process for declaring that a patient colonised with CPE is clear of CPE has not yet been defined.
Turnaround Times	2 Working days. For positive sample genotypes the reference laboratory aims to report 95% of results within 28 working days. The average time will be 15 working days following receipt. Results are transmitted to users by hard-copy.

Comments	Screen: a. All contacts of a patient with CPE. Where such contacts have been discharged prior to their identification as a contact, their record should be marked to ensure screening on next admission. b. All admissions to critical care areas (Intensive Care Units, High Dependency Units, Neonatal Intensive Care Units4), on admission and weekly thereafter. c. All admissions to haematology and transplant wards on admission and weekly thereafter. d. All patients who have received cancer chemotherapy in the previous 12 months on Admission. e. All patients who were transferred from any other hospital in Ireland or elsewhere. f. All patients who have been inpatients in any hospital in Ireland or elsewhere any time in the previous twelve months. Any hospital includes previous admissions to the hospital to which they are now being admitted. g. Renal dialysis patients at first dialysis in a unit, periodically during dialysis treatment (at intervals of not less than six months), and on return from dialysis elsewhere. h. All patients who normally reside in a long term care facility.

MRSA screen

Specimen Type	Nasal swab only (Routine initial screen). Nasal, throat, perineum, any areas of broken skin, catheter specimen urine if patient is catheterised, sputum sample if patient is intubated. (Known MRSA positive)
Sample Container	Blue amies agar transport swab
Sample collection/ preparation	Nasal Swab: 1. Insert the swab, pre-moistened with saline, approximately 2 cm into the nares. 2. Rotate the swab against the nasal mucosa. Note: Both nares should be sampled using the same swab. Throat Swab: 1. Using a tongue depressor, take a vigorous swab sample from the tonsil or back of pharynx. Perineum Swab: 1. Rotate all sides of the swab on the perineum surface area. Wound Swab: 1. Follow sample collection procedure recommended by Infection Prevention and Control.
Volume/Quantity	Nasal **Admission screening, Ward screening**: Take one nasal swab only. Swab both nares with one swab only. Throat, Perineum. One swab is sufficient for each site. Swab these sites only if Nasal swab is positive. Other If clinically or epidemiologically indicated: Take swabs from abnormal skin lesions (e.g. eczema, dermatitis, burns), lesions, manipulated sites (e.g. intravenous lines and urinary catheters), and urines.
Safety Requirements	Ensure the swab is returned fully to the transport medium case and correctly closed. Place in a sealed plastic specimen bag with request form in the pouch, ready for transport to the laboratory.
Time Between Collection and Processing	Send to the laboratory as soon as possible. If delivery to the laboratory is delayed, specimens should be refrigerated.
Sample Quality	N/A
Special Requirements	N/A
Turnaround Times	2-4 Working Days
Comments	Axilla and groin swabs are not part of routine MRSA screening protocol but will be processed if required for procedures in other hospitals.

Main Contents

VRE screen

Specimen Type	Rectal Swab.
Sample Container	Blue amies agar transport swab
Sample collection/ preparation	Moisten swabs in small amount of sterile water or saline in a universal container before swabbing site. Insert the swab into the rectum (through anal sphincter), gently rotate. The rectal swab should be visibly soiled. After collection, swabs should be placed in a non-nutrient Transport Medium such as Amies or Stuart.
Volume/Quantity	One swab is sufficient.
Safety Requirements	Ensure the swab is returned fully to the transport medium case and correctly closed. Place in a sealed plastic specimen bag with request form in the pouch, ready for transport to the laboratory.
Time Between Collection and Processing	Specimen should be transported and processed as soon as possible. If delivery to the laboratory is delayed, specimens should be refrigerated.
Sample Quality	The rectal swab should be visibly soiled.
Special Requirements	Following review of number of samples being received and processed for VRE screening and review of National Guidelines, VRE screening is only required from patients admitted to ICU, CCU or Medical Oncology wards.
Turnaround Times	2-4 Working Days
Comments	• Samples other than rectal swabs e.g. perineal swabs, are inappropriate for VRE surveillance.

Main Contents

Skin Scrapings *

Specimen Type	Skin Scrapings.
Sample Container	Slide.
Sample collection/ preparation	1. Obtain glass microscope slides with frosted glass ends and plastic slide holders. 2. Wearing Latex gloves pinch a skin lesion between index finger and thumb in order to exclude circulating blood. 3. Pick the surface of the lesion with a sterile scalpel blade. 4. Apply more pressure to obtain a drop of tissue fluid and blood, this is spotted directly onto a glass slide by pressing the slide against the lesion. Several small smears are better than one large one. 5. The procedure should be repeated with a second skin lesion. 6. Label the frosted end of the slide in pencil with the patient's name. Place in the slide holder and send to the laboratory for staining. 7. The excoriated lesion should also be swabbed with a culture swab.
Volume/Quantity	One sample is sufficient.
Safety Requirements	Ensure the slide is securely placed in the slide holder.
Time Between Collection and Processing	Send to the laboratory immediately.
Sample Quality	N/A
Special Requirements	N/A
Turnaround Times	1 Day
Comments	The sensitivity of this test however is at best 50%, so a NEGATIVE test does NOT exclude disease.

Main Contents

Sputum

Specimen Type	Sputum / Cough Swab
Sample Container	Sterile universal container or cough swab.
Sample collection/ preparation	The optimal time of collection is early in the morning and before antimicrobial therapy where possible. Expectorated: 1. Sample should be collected under the direct supervision of a nurse or physician. 2. Have the patient rinse or gargle with water to remove superficial flora. 3. Instruct patient to cough deeply to produce lower respiratory secretions. 4. Collect in sterile container. Induced: 1. Have the patient rinse the mouth with water after brushing the gums and tongue. 2. Using a nebulizer, have the patient inhale ≈ 25 mL of a 3-10% sterile saline solution. 3. Collect induced specimen in a sterile container. **Cough Swab** = This is a swab on a stick which is held as far back in the throat as possible while the child coughs. In very young children who cannot cough on request, rubbing the swab on the back of the throat, ideally immediately after the child has coughed.
Volume/Quantity	Ideally a minimum volume of 5mls of sputum should be obtained. For routine culture one specimen taken before commencement of antimicrobial therapy. For Mycobacteria (AFB) collect 3 specimens on consecutive days.
Safety Requirements	If the patient is suspected of having T.B. wear appropriate PPE as identified by local risk assessment during collection and discard any waste material into clinical waste bags. Ensure sterile universal containers are leak-proof and closed correctly. Place in a sealed plastic specimen bag with request form in the pouch, ready for transport to the laboratory.
Time Between Collection and Processing	Specimens should be transported to the laboratory as soon as possible. Sputum may be refrigerated for up to 2-3 h without an appreciable loss of pathogens. Any delay beyond this time may allow overgrowth of Gram-negative bacilli, and target organisms such as *Haemophilus* species and *Streptococcus pneumoniae* may be rendered non-viable. . Delays of over 48h are undesirable.
Sample Quality	Salivary or muco-salivary sputum specimens may give misleading results, as these specimens will be contaminated by normal mouth flora. These specimens may be rejected by Laboratory. Sputum specimens for routine bacteriological examination, which are greater than 24hours old, diminish the quality of the specimen.
Special Requirements	In SUH a **cough swab** is submitted only if a patient cannot expectorate and the use of sputum induction is not feasible at that time of sampling.
Turnaround Times	1-4 Days

Comments	• Indicate antimicrobial therapy on ordering requisition. • Respiratory therapists should collect a specimen via suction from paediatric patients unable to produce a sputum sample. • A good quality purulent or mucopurulent sputum specimen should be obtained, preferably before antimicrobial therapy although antimicrobial therapy should not be delayed unnecessarily while awaiting a sputum specimen. The specimen should be transported to the laboratory within 2 h. Specific aetiological agents have been associated with certain underlying diseases. It is therefore important to include all relevant clinical information. • TB culture is not routinely performed on sputum samples; please request this specifically if clinically indicated. Separate samples are required if both routine and TB culture is requested. • *Pneumocystis jiroveci* pneumonia (PCP) – Bronchoscopic or Induced sputum sample referred to external laboratory if testing is required.

Main Contents

Upper Respiratory Tract Samples

Ear Swab

Specimen Type	Ear.
Sample Container	Minitip Amies agar transport swab. 
Sample collection/ preparation	Inner ear: Sample must be acquired using aseptic technique. Follow protocols outlined by your health care facility for this sample type. Outer ear: Use a moistened swab to remove any debris or crust from the ear canal. Obtain sample by firmly rotating swab in the outer canal.
Volume/Quantity	One specimen is sufficient in the case of all swabs.
Safety Requirements	Ensure the swab is returned fully to the transport medium case and correctly closed. Place in a sealed plastic specimen bag with request form in the pouch, ready for transport to the laboratory.
Time Between Collection and Processing	Specimens should arrive in the laboratory within 24hrs of collection. In the event of any delays, store swab at 4°C. It is possible for coliforms to multiply in transport media after a few hours at room temperature causing a significant change in culture results.
Sample Quality	N/A
Special Requirements	N/A
Turnaround Times	2-5 Days
Comments	• Where possible specimen collection should occur before antimicrobial therapy and always when pus or exudate is present. • Respiratory syncytial virus and parainfluenza viruses have been isolated from middle ear effusions and may have a role in the aetiology of otitis media especially in children. Use a Green or Pink top viral culture swab if indicated. • Mycotic infection of the ear is a superficial, chronic or subacute infection of the external auditory canal. Fungal infection accounts for two to ten percent of cases of otitis externa, and most frequently occurs after treatment of bacterial infection. Superficial infection with *Candida* spp occurs more commonly in patients who use hearing aids. For investigation of fungal infection, scrapings of material from the ear canal are preferred although swabs can also be used.

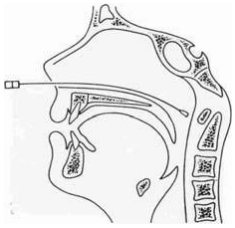
Main Contents

Nasal Swab

Specimen Type	Nasal.	
Sample Container	Bacterial Culture: Blue amies agar transport swab. 	Viral: Viral Swab (Pink or Green Top) 
Sample collection/ preparation	Sample the anterior nares by gently rotating the swab over the mucosal surface. Sample as soon as possible after symptoms begin. Before antiviral medications are administered, even if symptoms began more than one week ago	
Volume/Quantity	One specimen is sufficient in the case of all swabs.	
Safety Requirements	Ensure the swab is returned fully to the transport medium case and correctly closed. Place in a sealed plastic specimen bag with request form in the pouch, ready for transport to the laboratory.	
Time Between Collection and Processing	Specimens should arrive in the laboratory within 24hrs of collection. In the event of any delays, store swab at 4°C.	
Sample Quality	Diagnosis of respiratory viruses (influenzae, mumps, RSV, etc.) depends on the collection of high quality specimens, their rapid transport to the lab and appropriate storage. Nasopharyngeal swabs are superior to nasal swabs when considering viral studies thus all attempts should be made to obtain a nasopharyngeal swab.	
Special Requirements	N/A	
Turnaround Times	• Bacterial : 2-5 days • Viral : 2-4 Days (Referred to the National Virus Reference Laboratory – NVRL)	
Comments	• Indicate antibacterial and/or antiviral therapy on ordering requisition. • Viral swabs are unsuitable for routine bacteriological culture and will not be processed for such • Viral swabs are referred to external reference laboratory for processing.	

Main Contents

Nasopharyngeal (High Nasal) Swab or Aspirate

Specimen Type	Nasopharyngeal swab, Nasopharyngeal aspirate.		
Sample Container	Sterile Universal Container. 	Bacterial culture: Blue minitip amies agar flexible twisted wire 	<u>Viral</u>: Viral Swab (Pink or Green Top) 
Sample collection/ preparation	Optimal time for collection is at onset of symptoms and before antimicrobial or antiviral therapy where possible. <u>Swab</u> Bend the flexible wire of the swab very slightly in the shape of an arc. With the tip directed downwards, pass the swab gently along the floor of the nose for about 2 inches until it meets the resistance of the posterior wall of the nasopharynx (see diagram below). Allow the swab to remain in the nasopharynx for a moment so that secretions are absorbed onto the swab. Hold the child securely: this can be done by wrapping a blanket around the arms and holding the head steady (if a baby). A toddler can be held on the lap of the assistant while the latter holds the child's arms with one hand and the child's forehead with the other.  <u>Aspirate</u> Nasopharyngeal aspirate may be obtained using a suction catheter. The exudates are collected into the sterile plastic trap or a sterile clear plastic universal container and transported to the laboratory.		
Volume /Quantity	One specimen is sufficient in the case of all swabs. A minimum volume of 1ml is required for aspirates.		
Safety Requirements	Ensure the swab is returned fully to the transport medium case and correctly closed. Place in a sealed plastic specimen bag with request form in the pouch, ready for transport to the laboratory. Ensure sterile universal containers are leak-proof and closed correctly. Place in a sealed plastic specimen bag with request form in the pouch, ready for transport to the laboratory.		
Time Between Collection and Processing	Specimen should arrive in the laboratory within 24hrs of collection. If delivery to the laboratory is delayed, specimens should be refrigerated.		

Sample Quality	Diagnosis of respiratory viruses (influenzae, mumps, RSV, etc.) depends on the collection of high quality specimens, their rapid transport to the lab and appropriate storage. Nasopharyngeal swabs are superior to nasal swabs when considering viral studies thus all attempts should be made to obtain a nasopharyngeal swab.
Special Requirements	**Important:** Contact Microbiology prior to sampling to check on availability of culture media.
Turnaround Times	• Bacterial: 5-7 days • Viral: Same day if tested in-house. 3-14 days (NVRL Referred tests)
Comments	• Nasopharyngeal swabs are predominantly submitted for ***Bordatella* spp** culture. If an alternate etiologic agent, i.e. *C. diphtheriae*, is suspected, please indicate on requisition and contact Microbiology department directly. • Nasopharyngeal aspirates are reserved primarily for the detection of *Bordetella pertussis*. Other available referred tests are: Influenza A / Influenza B / Parainfluenza / RSV - Respiratory Syncytial Virus / Rhinovirus / Human Metapneumovirus / CMV - Cytomegalovirus / Paramyxoviridae / Paramyxovirus / Pneumovirinae / Measles

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Nasopharyngeal (High Nasal) Swab or Aspirate in Universal Transport Medium (UTM-RT)) for PCR (SARS-CoV-2 and other Respiratory Viruses)

Specimen Type	Nasopharyngeal PCR (Required for SARS-CoV-2 and Respiratory Viruses Screening)
Sample Container	 Universal Transport Medium (UTM-RT)
Sample collection/ preparation	See previous Nasopharyngeal details (above). Instructions for UTM use are as follows; 1. Collect specimen with swab 2. Aseptically remove red cap from the tube with the UTM-RT liquid medium. 3. Insert swab into the tube with UTM-RT liquid medium 4. Break swab shaft by bending it against the tube wall. 5. Replace cap on tube and close tightly 6. Label with appropriate patient information. 7. Send to the laboratory immediately.
Volume/Quantity	The required specimen is a nasopharyngeal swab into 3 ml of Universal Transport Medium (UTM-RT). See picture above. These can be provided by the laboratory on request. Please note if a liquid swab is not submitted, we cannot provide the rapid testing.
Safety Requirements	Refer to HPSC Acute Hospital Infection Prevention and Control Precautions for Possible or Confirmed COVID-19 in a Pandemic Setting
Time Between Collection and Processing	Testing for virus nucleic acid in a person diagnosed with COVID-19 is not appropriate before declaring that the infectious period is over. Testing for virus nucleic acid in a person previously diagnosed with COVID-19 is generally not appropriate before scheduling treatment (surgery or other treatment) in a person who has Clinically recovered.
Sample Quality	Please submit nasopharyngeal swabs for PCR testing as our testing platforms are not validated for nasal swabs.
Special Requirements	**Rapid PCR** Batch times, numbers of specimen (6 per batch) and criteria for rapid SARS-CoV-2 testing; 12 am, 8 am, 12pm, 4 pm & 8 pm • All ED / CAU attendances to the Red Zone • Unvaccinated emergency attendances /admission • All admissions to the Oncology ward

	• ICU admissions (Also, admission to Med 5 escalation beds should have Covid result before transfer to ward) Post midnight, 2 rapid tests are available for medical emergencies and require Consultant to Consultant Microbiologist approval. In order to prioritise scarce resources, please note that rapid tests will not be performed on known positive patients. Similarly, positive antigen tests do not warrant a rapid PCR test. These will be tested on the Batch system. All other rapid requests must be authorised by consultant microbiologists
Turnaround Times	Specimens must be received in laboratory 1 hour before tests are set up. Excess specimens will be processed on the next batch. Rapid Turnaround time is 2 hours (3 hours for respiratory panel)
Comments	Re: **Add-on Respiratory testing** e.g. Flu / RSV / Adenovirus / Enterovirus Please note that Add-on respiratory viral tests are NOT performed in Microbiology without prior consultant to consultant microbiologist approval e.g. Biofire Filmarray Respiratory Panel. Otherwise, please submit a repeat specimen with a new test request form. All positive test results on patients will be phoned to the ward. Negative results will be available on the LIS immediately once the results are authorised in the laboratory. Please do not call regarding rapid tests except for Consultant to Consultant communication in medical emergencies out of hours. (Refer to PATH-MICRO-POL-7 / PATH-SER-POL-5 Handling of Verbal or Electronic add-on Test Requests). For the full range of organisms detected by PCR in SUH, refer to **PATH-MICRO-REC-278** (Guide to PCR Testing in SUH Microbiology). For related queries Refer to Microbiology - Molecular Testing Policy (PATH-MICRO-POL-44).

Main Contents

Oral Swabs

Specimen Type	Gum, Mouth, Tongue
Sample Container	Blue amies agar transport swab
Sample collection/ preparation	Sample any lesions or inflamed areas. The use of a tongue depressor or spatula will aid vision and avoid contamination from other parts of the mouth.
Volume/Quantity	One specimen is sufficient in the case of all swabs.
Safety Requirements	Ensure the swab is returned fully to the transport medium case and correctly closed. Place in a sealed plastic specimen bag with request form in the pouch, ready for transport to the laboratory.
Time Between Collection and Processing	Specimens should arrive in the laboratory within 24hrs of collection. If delivery to the laboratory is delayed, specimens should be refrigerated.
Sample Quality	N/A
Special Requirements	N/A
Turnaround Times	2-4 Days
Comments	N/A

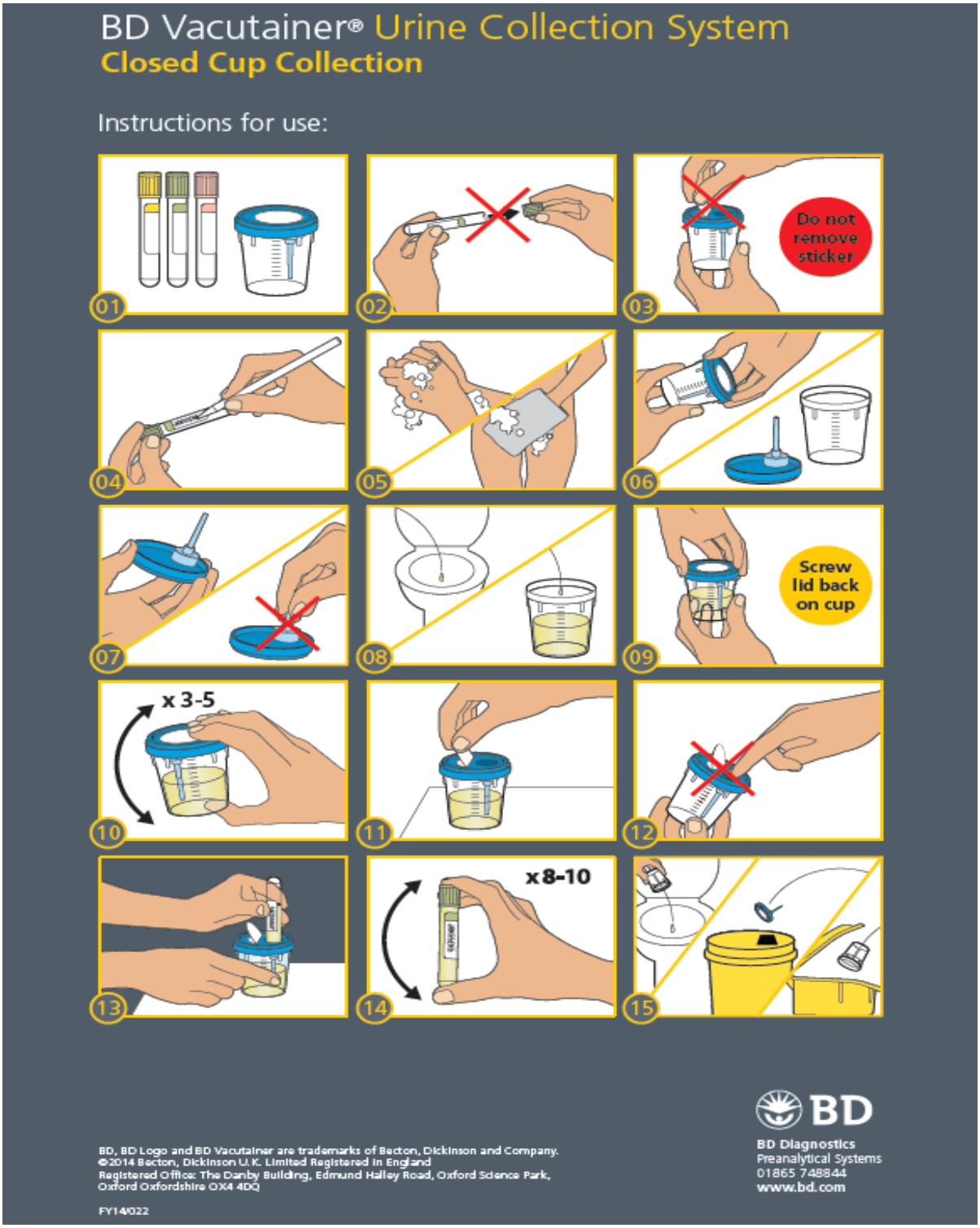
Main Contents

Throat Swab

Specimen Type	Throat	
Sample Container	Bacterial Culture: Blue amies agar transport swab. 	Viral: Viral Swab (Pink or Green Top) 
	Molecular /PCR Universal Transport Medium (UTM-RT) 	
Sample collection/ preparation	1. Depress the tongue with a tongue depressor. 2. Sample the posterior pharynx, tonsils and inflamed areas. Do not touch the buccal mucosa or tongue. Sample as soon as possible after symptoms begin. Before antibacterial or antiviral medications are administered. Even if symptoms began more than one week ago.	
Volume/Quantity	One specimen is sufficient in the case of all swabs.	
Safety Requirements	Ensure the swab is returned fully to the transport medium case and correctly closed. Place in a sealed plastic specimen bag with request form in the pouch, ready for transport to the laboratory.	
Time Between Collection and Processing	Specimen should arrive in the laboratory within 24hrs of collection. If delivery to the laboratory is delayed, specimens should be refrigerated.	
Sample Quality	N/A	
Special Requirements	N/A	
Turnaround Times	• Bacterial: 2-4 days • Viral: 3-14 days (Referred tests) • Rapid PCR : 2 Hours	
Comments	• Indicate antibacterial and/or antiviral therapy on ordering requisition. • Throat cultures are contraindicated for patients with an inflamed epiglottis. For specific etiologic agents, i.e. *C. diphtheriae*, please provide information to laboratory.	

	• Throat swabs for *N. gonorrhoeae* should be transported to the laboratory as soon as possible. • Respiratory viruses are recovered during 3-7 day viral shedding period following infection. • Give date of onset of illness, date of collection and brief clinical description or the provisional diagnosis. For example, does the patient have a rash, a respiratory illness or neurological symptoms?

Urine Microscopy and Culture **NB: THERE IS AN INTEGRATED SHARP IN THE COLLECTION CUP LID**



Specimen Type	Mid Stream Urine, Catheter Urine, Bag Urine, Suprapubic Aspirate, Catch Specimen Urine.
Sample Container	Sterile BD Urine collection cup and vacutainer **NB: Sharp Risk-There is an integrated sharp in the collection cup lid !!**
Sample collection/ preparation	<u>Mid Stream Urine.</u> A clean mid-stream specimen is essential. Female: 1. Thoroughly cleanse the urethral area with soap and water or wipes. 2. Rinse the area with wet gauze pads. 3. While holding the labia apart, begin voiding. 4. After several milliliters have been passed, collect a midstream portion (without stopping the flow) into the Sterile BD Urine collection cup. 5. Transfer urine into the urine vacutainer and submit vacuntainer to laboratory. Male: 1. Retract the foreskin (if uncircumcised) and clean the glans with soap and water (rinse after cleansing) or wipes. 2. Begin voiding. 3. After several milliliters have been passed, collect a midstream portion (without stopping the flow) into the Sterile BD Urine collection cup. 4. Transfer urine into the urine vacutainer and submit vacuntainer to laboratory. <u>Catheter Urine.</u> Samples may be from patients who have had a catheter passed for a one-off urine sample or who have in-dwelling catheters. In patients with a long term indwelling catheter, samples should only be sent if clinically indicated i.e. patient symptomatic or systemically unwell or where patient has urinary retention or has urinary tract instrumentation. 1. Disinfect the catheter collection port with 70% alcohol. 2. Use a needle and syringe to aseptically collect 5-10 mL of urine into the Sterile BD Urine collection cup. 3. Transfer urine into the urine vacutainer and submit vacuntainer to laboratory. <u>Bag Urine.</u> A sterile collection bag is attached to the cleansed perineum to catch urine, which must than be drained into the Sterile BD Urine collection cup. This is commonly used in infants. 1. Thoroughly wash the area around the urethra. 2. Open a urine collection bag (a plastic bag with an adhesive paper on one end). For boys, the entire penis can be placed in the bag and the adhesive attached to the skin. For girls, place the bag over the labia. 3. Diaper the infant as usual, covering and securing the bag. Check the baby frequently and remove the bag after the infant has urinated into it. Active infants may displace the bag, so it may take more than one attempt to obtain the specimen. 4. Drain the urine into the Sterile BD Urine collection cup. 5. Transfer urine into the urine vacutainer and submit vacuntainer to laboratory.

	Suprapubic Aspirate. This method is used when a bedridden patient cannot be catheterized or a sterile specimen is required. The urine specimen is collected by needle aspiration through the abdominal wall into the bladder. Catch Specimen Urine. Thorough periurethral cleaning is recommended. The whole specimen is collected into the Sterile BD Urine collection cup. Transfer urine into the urine vacutainer and submit vacuntainer to laboratory.
Volume/Quantity	Minimum volume ≥ 1 ml. One specimen is sufficient in most cases.
Safety Requirements	Ensure sterile urine vacutainer is leak-proof and closed correctly. Place in a sealed plastic specimen bag with request form in the pouch, ready for transport to the laboratory.
Time Between Collection and Processing	Specimens should be transported and processed within 2 hours where possible. **Any sample which may be subject to delay of more than 2 hrs before being sent to the lab should be refrigerated.**
Sample Quality	Urine acts as a culture medium and therefore specimens should be stored at 4^0C to prevent subsequent multiplication of bacteria after collection of the patient sample which would invalidate the bacterial count. Bag Urine Culture results can be difficult to interpret with this sample type as contamination with skin flora is common. Mid Stream Urine An MSU significantly reduces the opportunities for contaminants to enter into the urine stream.
Special Requirements	Refrigerate samples at 4^0C if delivery to the lab is longer than 2 hours.
Turnaround Times	• Urgent Microscopy / Cell Count = 2 hours • Routine Microscopy/Cell count = Same Day • Culture/Sensitivity = 1→ 3 days
Comments	**Reference Range:** METHOD / CELL / COUNT (/ µL): Automated Cell Counts — WBC < 40; RBC < 100 Manual Cell Counts — WBC < 20; RBC < 100 • Please indicate clearly on request form if requesting examination for cellular casts. The first morning urine sample is preferable. • Urinary catheter tips are inappropriate for culture and will not be processed.

	• Bacteriuria occurs in the vast majority of patients who are catheterised for more than 5 days, a urine specimen should only be sent if there are symptoms or signs suggestive of a urinary or a systemic infection. • In severe or complicated UTI, a follow-up specimen should be taken 5 days post completion of antibiotic therapy. Persistence of bacteriuria implies a structural abnormality. The uncertainty associated with Urine cell counts, is available to service users if required, and is available on the Q Pulse system. This record is PATH-MICRO-REC-80 Cell Count Reporting Update (2022) Values of >1000 /µL of white blood cells (WBC) and/or red blood cells (RBC) will no longer be reported for automated cell counts, rather it will be the **absolute value** counted per µL. Reporting of manual counts will remain unchanged i.e. the absolute value of WBC and RBC will be reported up to 999 per µL. Thereafter, >1000/µL will be reported. Bacterial cells and epithelial cells will be reported as scanty, 1+, 2+ or 3+.

Additional URINE Tests

Urinary Antigen - Legionella

Specimen Type	Urine
Sample Container	Sterile BD Urine collection cup and urine vacutainer **NB: Sharp Risk-There is an integrated sharp in the collection cup lid !!**
Sample collection/ preparation	Collect a urine specimen into a Sterile BD Urine collection cup and transfer to the urine vacutainer. Submit vacutainer only to the laboratory.
Volume/Quantity	Minimum volume ≥ 1 ml, ensure that the lid of the container is firmly closed. One specimen is sufficient.
Safety Requirements	Place urine vacutainer in a sealed plastic specimen bag with request form in the pouch, ready for transport to the laboratory.
Time Between Collection and Processing	≤ 4 hrs, store at room temperature. Alternatively, specimens may be stored at 2-8oC for up to 14 days or frozen (-20oC) for longer periods before testing
Sample Quality	Boric acid may be used as a preservative.
Special Requirements	N/A
Turnaround Times	Same Day
Comments	• This test is useful in the early detection of Legionnaires disease. Antigen excretion may begin as early as 3 days after onset of symptoms and persist for up to a year afterwards. • Excretion of Legionella antigen in urine may vary depending on the individual patient and the stage of the disease. Some individuals have been shown to excrete antigen for an extended period of time, so a positive test reaction may reflect a recent but not active infection. • Early treatment with appropriate antibiotics may also decrease antigen excretion in some individuals.

Urinary Antigen - Pneumococcal

Specimen Type	Urine
Sample Container	Sterile BD Urine collection cup and urine vacutainer **NB: Sharp Risk-There is an integrated sharp in the collection cup lid !!**
Sample collection/ preparation	Collect a urine specimen into a Sterile BD Urine collection cup and transfer to the urine vacutainer. Submit vacutainer only to the laboratory.
Volume/Quantity	Minimum volume ≥ 1 ml. One specimen is sufficient.
Safety Requirements	Place urine vacutainer in a sealed plastic specimen bag with request form in the pouch, ready for transport to the laboratory.
Time Between Collection and Processing	≤ 4 hrs, store at room temperature. Alternatively, specimens may be stored at 2-8oC for up to 14 days or frozen (-20oC) for longer periods before testing
Sample Quality	Boric acid may be used as a preservative.
Special Requirements	N/A
Turnaround Times	Same Day
Comments	N/A

Urine - Pregnancy Tests

Specimen Type	Urine
Sample Container	Sterile BD Urine collection cup and urine vacutainer **NB: Sharp Risk-There is an integrated sharp in the collection cup lid !!**
Sample collection/ preparation	Collect a urine specimen into a Sterile BD Urine collection cup and transfer to the urine vacutainer. Submit vacutainer only to the laboratory.
Volume/Quantity	Minimum volume ≥ 1 ml. One specimen is sufficient.
Safety Requirements	Place urine vacutainer in a sealed plastic specimen bag with request form in the pouch, ready for transport to the laboratory.
Time Between Collection and Processing	≤ 48 hrs, store at 2-8°C for up to 48 hours or frozen (-20°C) for longer periods before testing
Sample Quality	n/a
Special Requirements	A first morning urine specimen is preferred since it generally contains the highest concentrationof hCG; however, urine specimens collected at any time of the day may be used.
Turnaround Times	Same Day
Comments	N/A

Wounds

Specimen Type	Superficial wounds, Bite wounds, Post Operative wounds, Deep-Seated wound infections, Burns.
Sample Container	Amies agar transport swab
Sample collection/ preparation	The optimal time of collection is before antimicrobial therapy where possible. Superficial or Bite wound swabs: 1. Remove surface exudate by wiping with sterile saline or 70% alcohol. Sample must be acquired using aseptic technique. 2. Sample a representative part of the lesion. Soak the swab well in any pus or exudates. Samples of pus, if present, are preferred to swabs. Post Operative or Deep-Seated wounds: 1. Swab the deepest part of the wound to avoid the superficial microflora. Swabs must be well soaked in pus.
Volume/Quantity	One specimen is sufficient in the case of all swabs.
Safety Requirements	Ensure the swab is returned fully to the transport medium case and correctly closed. Place in a sealed plastic specimen bag with request form in the pouch, ready for transport to the laboratory.
Time Between Collection and Processing	Specimen should arrive in the laboratory within 24hrs of collection. If a delay in transport or processing is anticipated, the specimen should be refrigerated.
Sample Quality	The volume of the specimen influences the transport time that is acceptable. Larger volumes of purulent material maintain the viability of anaerobes for a longer period of time. The recovery of anaerobes is compromised if the transport time exceeds 3 hours.
Special Requirements	Indicate type of bite wound, i.e. human or animal, on the ordering requisition.
Turnaround Times	2-4 Days
Comments	Samples of pus, if present, are always preferred to swabs. Please refer to the test section on Pus.

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23. Serology

General Serology Information

Sample collection/preparation:

Gently invert the blood tubes 4-6 times immediately after blood collection to reach a proper mix of additive and blood. Do not shake the tubes. Vigorous mixing may cause foaming or haemolysis. Insufficient mixing or delayed mixing in serum tubes may result in delayed clotting.

Complete the Microbiology Specimen Request Form (green) for Chlamydia testing or the Blood Sciences request form (blue) for all Serology Blood tests, fully to ensure compliance with the Patient Specimen and Request Form Identification Criteria.

Request form data should include all clinical details and in particular stating:

- Routine screen to establish immune status
- Date of onset of illness if appropriate
- Contact details
- Vaccination History
- Previous exposure
- Travel history
- Symptoms for example Rash, specific organ or anatomical involvement
- If inoculation injury specify source or recipient.

Volume/Quantity:

A minimum of one full vacuette tube containing 3-4 ml of whole blood is required for all serological tests performed “in-house” at SUH. Paediatric specimen tubes should be filled to contain a minimum of 1.5 mls of whole blood. If other tests, which are sent to external reference laboratories are required please collect a second tube.

Specimen Collect Date and Time

Specimen collect date and time MUST BE PROVIDED for all antibiotic requests, Molecular serology investigations – PCR, Viral Load, Genotype, CD4 count. Clotted and EDTA specimens taken for molecular virology testing MUST be sent immediately to the laboratory for IMMEDIATE separation and freezing to maintain the integrity of the viral DNA or RNA.
See List of Serology tests for more details.

Anonymous / Uniquely Identified specimens

Where confidentiality demands, unique identifier or patient initials may be used but it is mandatory that Date of Birth is supplied. Patient initials, DOB, and unique GUM clinic number are the unique identifiers for GUM clinic.The patient is identified by the attending physician /nurse, who ask him/her to confirm their identity prior to sampling.

HIV Testing

Request for serology for HIV testing are accepted on the understanding that the patient has been properly counselled and the result will be returned under confidential cover to the clinician whose name is on the request form as having requested the test

Storage and Transport of Serology Samples

All specimens should be sent to the Laboratory as quick as possible, preferably within a few hours of specimen collection. All specimens should be transported at ambient temperature and if delivery is delayed specimens should be refrigerated. Samples are centrifuged as soon as possible after receipt in Laboratory to avoid deterioration.

Needle Stick Injuries (NSI's)

Bloods from NSI's are processed in Serology. Personnel who sustain a NSI should contact Occupational Health Department and present at ED, where necessary arrangements will be made to obtain blood. Testing is performed during routine workin day.

Safety requirements:

- Standard precautions should be adhered to when collecting blood or biological material.
- Wear gloves during venepuncture, and when handling blood collection tubes to minimise exposure hazard. After venepuncture, the top of the cap may contain residual blood. Take proper precautions when handling tubes to avoid exposure to this blood.
- Dispose of any used needles using an appropriate disposal device. Do not resheath needle. Resheathing of needles increases the risk of needle stick injury and blood exposure.
- Place tube in sealable section of plastic specimen bag and request form in separate pouch section for transport to the laboratory. If delivery from an outlying site please ensure packaging complies with ADR requirements.

Sample Quality:

Grossly Lipaemic, Grossly Haemolysed or heat affected specimens are not suitable for testing.

Special Requirements:

If delivery to the laboratory is delayed, specimens should be refrigerated.

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24. Criteria for Rejection of Serology Specimens

As well as the general specimen acceptance/ rejection criteria (described at the introductory section of this manual) there are specific rejection criteria that are carried out in the Serology Laboratory. These are described in table below. Where possible, specimens are stored until relevant information is supplied by clinician and the sample can then be processed. However many of the rejection scenarios described below may not be rectified without a new sample being submitted.

Serology Test	Sample Type	Test requirements	Reason for rejection given on report and Corrective Action Required
* Sample referred to external laboratory			
All	Clotted Blood	Samples to be delivered to Laboratory ASAP but within 72 hours of venepuncture	Unspun blood sample received > 72 hrs from venepuncture. Sample too old to process. Unsuitable for analysis./ Advise submit repeat specimen
Amikacin levels	Clotted Blood	Not applicable	Test not available. Discuss with Consultant Microbiologist./ Antimicrobial Pharmacist
Amoebic Serology*	Clotted Blood	Relevant Clinical details provided or prior discussion with Consultant Microbiologist required.	No relevant clinical details provided and no discussion with Consultant Microbiologist./ Please contact Consultant Microbiologist with relevant clinical details for test to be processed.
Bordatella pertussis antibodies*	Clotted Blood	Relevant Clinical details provided or prior discussion with Consultant Microbiologist required.	No relevant clinical details provided and no discussion with Consultant Microbiologist./ Please contact Consultant Microbiologist with relevant clinical details for test to be processed.
Chlamydia trachomatis (CT) / Neisseria	Urine specimen Endocervical swab Urethral Swab	Urine and swabs for CT/GC PCR should be received in a (Urine or Swab) Aptima collection device that is in date	Expired Aptima collection device received unsuitable for analysis

Serology Test	Sample Type	Test requirements	Reason for rejection given on report and Corrective Action Required
* Sample referred to external laboratory			
gonorrhea (GC) PCR *	Eye Swab Rectal Swab Throat Swab	provided by the Serology Laboratory. Urine sample received in a universal container must reach Serology Lab within 24 hrs of collection so that it can be transferred to a Aptima Urine Collection device. Specimen collect date and time must be provided. The level of urine in the Aptima collection device must be between the two black indicator lines on the tube. For Swabs: Discard cleaning swab (WHITE shafted swab) after use. Specimen collection swab (BLUE shafted swab) ONLY must be put in Aptima transport tube Request form MUST state Chlamydia&Gonorrhea	 No Collect date and time provided on Universal urine container. Unable to establish if it is < 24 hrs since collection or Urine sent in primary universal container > 24 hours of collection. Urine sample does not fall between the guidance markers on the collection device and is unsuitable for analysis Swab unsuitable for analysis if white shafted & blue shafted swabs OR white shaft swab only are received in Aptima transport tube For all of the above: Advise submit repeat specimen.
Chloramphenicol levels *	Clotted Blood	Not applicable	Test not available. Discuss with Consultant Microbiologist.
CMV DNA *	EDTA whole blood Urine	Specimen collect date and time must be provided on request form. **EDTA** sample must be received in Laboratory, separated and frozen within **24 hrs** of venepuncture. Urine samples must be frozen ASAP. Laboratory must be **contacted**.	Incorrect sample received - Clotted Blood unsuitable for analysis - EDTA Blood samples required Specimen date and collect time NOT provided. Sample received in laboratory > 24hrs of venepucture For all of the above:

Serology Test	Sample Type	Test requirements	Reason for rejection given on report and Corrective Action Required
* Sample referred to external laboratory			
			Advise submit repeat specimen
Clostridium tetani antibodies *	Clotted Blood	Relevant Clinical details provided or prior discussion with Consultant Microbiologist required.	No relevant clinical details provided and no discussion with Consultant Microbiologist./ Please contact Consultant Microbiologist with relevant clinical details for test to be processed.
***Corynebacterium diphtheriae* antibodies ***	Clotted Blood	Relevant Clinical details provided or prior discussion with Consultant Microbiologist required.	No relevant clinical details provided and no discussion with Consultant Microbiologist./ Please contact Consultant Microbiologist with relevant clinical details for test to be processed.
Coxiella burnetti (Q fever) antibodies *	Clotted Blood	Relevant Clinical details provided or prior discussion with Consultant Microbiologist required.	No relevant clinical details provided and no discussion with Consultant Microbiologist./ Please contact Consultant Microbiologist with relevant clinical details for test to be processed.
Cryptococcus Serology *	Clotted Blood	Relevant Clinical details provided & prior discussion with Consultant Microbiologist required.	No relevant clinical details provided and no discussion with Consultant Microbiologist./ Please contact Consultant Microbiologist with relevant clinical details for test to be processed.
Dengue antibodies *	Clotted Blood	Relevant Clinical Details including details of foreign travel or prior discussion with Consultant Microbiologist required.	No relevant clinical details provided and no discussion with Consultant Microbiologist./ Please contact Consultant Microbiologist with relevant clinical details for test to be processed.

Serology Test	Sample Type	Test requirements	Reason for rejection given on report and Corrective Action Required
* Sample referred to external laboratory			
Echinococcus antibodies * (Hydatid Cyst / Cystercercosis Ab)	Clotted Blood	Relevant Clinical details provided & prior discussion with Consultant Microbiologist required.	No relevant clinical details provided and no discussion with Consultant Microbiologist./ Please contact Consultant Microbiologist with relevant clinical details for test to be processed.
Epstein-Barr PCR *	EDTA whole blood	Specimen date and collect time MUST be indicated on request form. **EDTA** samples must be received in Laboratory, separated and frozen within **24 hrs** of venepuncture.	Incorrect sample received - Clotted Blood unsuitable for analysis. EDTA Blood samples required Specimen date and collect time NOT provided. Sample received in laboratory > 24hrs of venepucture. For all of the above: Advise submit repeat specimen
Hepatitis C RNA	EDTA Whole Blood or Clotted Blood	Specimen collect date and time must be indicated on request form. Specimen must be sent to the Serology Lab Urgently so that it can be centrifuged, aliquoted and frozen within 6 hrs of venepuncture. The Serology laboratory must be **contacted** before blood is taken and specimen must reach laboratory before 4pm.	Specimen date and collect time NOT provided or or specimen received in laboratory > 6 hours from venepuncture. Sample not received and frozen within 6 hours of venepuncture/ Advise submit repeat specimen
HCV genotype *	EDTA Whole Blood or Clotted Blood	Specimen collect date and time must be indicated on request form. Specimen must be sent to the Serology Lab Urgently so that it can be centrifuged, aliquoted and frozen within 6 hrs of venepuncture. The Serology laboratory must be **contacted** before blood is taken and specimen must reach laboratory before 4pm.	Specimen date and collect time NOT provided or specimen received in laboratory > 6 hours from venepuncture Sample not received and frozen within 6 hours of venepuncture./ Advise submit repeat specimen

Serology Test	Sample Type	Test requirements	Reason for rejection given on report and Corrective Action Required
* Sample referred to external laboratory			
HIV Viral load *	EDTA whole blood	Specimen collect date and time must be indicated on request form. Two **EDTA** samples must be received centrifuged and frozen within **6 hours** of venepuncture. Laboratory must be **contacted** before blood is taken.	Specimen date and collect time NOT provided or specimen received in laboratory > 6 hours from venepuncture. Sample not received and frozen within 6 hours of venepuncture./ Advise submit repeat specimen
Hepatitis B Viral Load *	EDTA Whole	Specimen collect date and time must be indicated on request form. Specimen must arrive in Serology Urgently so that it can be centrifuged, aliquoted and frozen within 6 hrs of venepuncture. The Serology laboratory must be **contacted** before blood is taken and specimen must reach laboratory before 4pm.	Specimen date and collect time NOT provided or specimen received in laboratory > 6 hours from venepuncture. Sample not received and frozen within 6 hours of venepuncture./ Advise submit repeat specimen
Legionella *	Urine	Blood samples unsuitable for testing. Urine sample required.	Incorrect sample received. Blood sample received, Unsuitable for analysis,/ Advise submit Urine sample. Urine antigen detection has replaced the antibody test as the primary diagnostic method for Legionella pneumophila.
Mycoplasma IgM *	Clotted Blood	NVRL test Mycoplasma IgM for patients under the age of 20. For samples on patients 20 or older are sent to Eurofins Biomnis whilst respiratory sample more suitable specimen type for molecular testing.	Patients > 20 years where Consultant Microbiologist advises respiratory sample instead
Pneumococcal antibodies *	Clotted Blood	Relevant Clinical details provided or prior discussion with Consultant Microbiologist required.	No relevant clinical details provided and no discussion with Consultant Microbiologist/ Please contact Consultant Microbiologist with relevant clinical details for test to be processed.
Polyomavirus *	Clotted Blood Urine	Specimen collect date and time must be provided on request	Specimen date and collect time NOT provided or

Serology Test	Sample Type	Test requirements	Reason for rejection given on report and Corrective Action Required
* Sample referred to external laboratory			
(JC & BK)		form and sample. Blood Sample must be received and frozen within 24 hours of venepuncture. Urine sample must be frozen within 24 hrs	Sample received in laboratory > 24hrs of venepucture/ Advice submit repeat sample.
Schistosomal antibodies * (Primarily screened on urine in microbiology)	Clotted Blood	Relevant Clinical details provided or prior discussion with Consultant Microbiologist required.	No relevant clinical details provided and no discussion with Consultant Microbiologist. / Please contact Consultant Microbiologist with relevant clinical details for test to be processed.
Staphyloccal antibodies *	Clotted Blood	Test currently suspended	
Teicoplanin level *(Trough)	Clotted Blood	Test NOT routinely processed, Discuss with Consultant Microbiologist	
Tobramycin Level *	Clotted Blood	Test NOT routinely processed, Discuss with Consultant Microbiologist	
Viral Screen *	Clotted Blood	'Specimens accompanied by forms requesting 'Viral Studies" are not routinely processed: clinical details are essential and tests MUST be specified. Refer to NVRL User manual. Clinical team in NVRLcan be contacted at 01 7164418 for discussion re the most appropriate test(s) to request.	Tests MUST be specified. A serum aliquot of this sample has been stored, but will not be processed until Lab contacted & tests specified.
West Nile Virus *	Clotted Blood	Relevant Clinical Details including history or prior discussion with Consultant Microbiologist.	No relevant clinical details provided and no discussion with Consultant Microbiologist/ Please contact Consultant Microbiologist with relevant clinical details for test to be processed.
Yersinia antibodies *	Clotted Blood		Test discontinued. The recommended method for the diagnosis of suspected Yersiniosis is the culture of Yersinia species from faecal specimens.

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25. List of Serology tests

PAEDIATRIC SAMPLES: If submitting 2 ml microtubes please provide 1 tube per investigation

Test/ Profile	Specimen Type	Additive required	Volume Required/ ml	Container Type	Special Requirements	Turnaround Times
* Specimens/ samples are referred to external laboratory for testing ** If sample needs to be sent to referral Lab for supplemental/ confirmatory testing Turnaround Time will be longer. Days are expressed as Calendar days.						
Adenovirus PCR*	Blood	None	5.0	Purple top vacuette EDTA or red top vacuette serum tube	Serology lab must be notified before sending samples. Collect date and time must be provided. Sample must be frozen within 24hrs	7-12 days
Amikacin levels *	Blood	None	5.0	Red top vacuette serum tube	Test Not available. Discuss with Consultant Microbiologist / Antimicrobial pharmacist	
Amoebic Serology *	Blood	None	5.0	Red top vacuette serum tube	Relevant clinical details provided or prior consultation with Consultant Microbiologist.	18-24 days
Antenatal Screen/ Rubella, Syphilis, HBsAg, HIV **	Blood	None	5.0	Red top vacuette serum tube		2- 6 days
Antibiotic assays	See under individual antibiotic assays					
Anti-DNAse B (Streptococcus Abs) *	Test No longer available					

Test/ Profile	Specimen Type	Additive required	Volume Required/ ml	Container Type	Special Requirements	Turnaround Times
* Specimens/ samples are referred to external laboratory for testing ** If sample needs to be sent to referral Lab for supplemental/ confirmatory testing Turnaround Time will be longer. Days are expressed as Calendar days.						
Anti-Streptolysin titre (ASOT)	Blood	None	5.0	Red top vacuette serum tube	Useful for the investigation of Group A Beta-haemolytic Streptococcal infection or post-streptococcal disorder e.g. rheumatic fever.	1 – 3 da
Aspergillus precipitans *	Blood	None	5.0	Red top vacuette serum tube		13 – 18 days
Aspergillus PCR*	Blood	None	5.0	Purple top EDTA tube	Only available for patients attending Crumlin	
Avian allergans *	Blood	None	5.0	Red top vacuette serum tube		13 – 21 days
Bartonella henselae and quintana antibodies */ Cat Scratch Disease	Blood	None	5.0	Red top vacuette serum tube		
*BK virus**					See Polyomavirus	
Bordatella pertussis antibodies *	Blood	None	5.0	Red top vacuette serum tube	Relevant clinical details provided or prior consultation with Consultant Microbiologist	12-16 days
Borrellia burgdorferi antibodies (Lyme Disease)*	Blood	None	5.0	Red top vacuette serum tube		13 – 18 days
	CSF	None	500µl		Must be accompanied with blood sample within 24 hrs of CSF collection	
Brucella screen *	Blood	None	5.5	Red top vacuette serum tube		7-14 days

Test/ Profile	Specimen Type	Additive required	Volume Required/ ml	Container Type	Special Requirements	Turnaround Times
* Specimens/ samples are referred to external laboratory for testing ** If sample needs to be sent to referral Lab for supplemental/ confirmatory testing Turnaround Time will be longer. Days are expressed as Calendar days.						
Chikungunya IgM*	Blood	None	5.0	Red top vacuette serum tube		
*Chlamydia Pnemoniae IgM and IgG**	Blood	None	5.0	Red top vacuette serum tube		
*Chlamydia Psittaci IgG and IgM**	Blood	None	5.0	Red top vacuette serum tube		
Chlamydia trachomatis (CT) PCR * Samples requested for CT investigations will also be tested for *Neisseria gonorrhoeae* (GC) and also Mycoplasma genitalium if requested	Urethral Swab Endocervical Swab Eye Swab Throat swab Rectal Swab Urine specimen	None	Not relevant	Swab/ Urine APTIMA collection device kits Available from Serology Lab	Details on specimen collection for combined CT and GC testing are included in the APTIMA collection device kits	7-14 days
Chloramphenicol levels *	Blood	Test Not available, Discuss with Consultant Microbiology				
Clostridium tetani antibodies *	Blood	None	5.5	Red top vacuette serum tube	Relevant clinical details or following prior consultation with Consultant Microbiologist.	18-24 days
Coeliac Screen**	Blood	None	5.5	Red top vacuette serum tube	Supplementary testing sent to Immunology UCHG if Anti tTG is positive on initial screening.	2-5 days for in-house screen
Corynebacterium diphtheriae antibodies *	Blood	None	5.5	Red top vacuette serum tube	Relevant clinical details or following prior consultation with Consultant Microbiologist.	18-24 days

Test/ Profile	Specimen Type	Additive required	Volume Required/ ml	Container Type	Special Requirements	Turnaround Times
* Specimens/ samples are referred to external laboratory for testing ** If sample needs to be sent to referral Lab for supplemental/ confirmatory testing Turnaround Time will be longer. Days are expressed as Calendar days.						
Covid Abs/ Anti SARS COV 2*	Blood	None	5.0	Red top vacuette serum tube	Only accepted following prior consultation with Consultant Microbiologist	
Coxiella burnetti (Q fever) antibodies *	Blood	None	5.5	Red top vacuette serum tube	Relevant clinical details or following prior consultation with Consultant Microbiologist.	18 - 24 days
Cryptococcus Serology *	Blood	None	5.5	Red top vacuette serum tube	Only accepted following prior consultation with Consultant Microbiologist.	24 days
Cytomegalovirus (CMV) antibodies *	Blood	None	5.5	Red top vacuette serum tube		7-12 days
Cytomegalovirus (CMV) DNA CMV PCR *	Blood	K EDTA	4.5	Purple top vacuette EDTA tube	Serology Lab must be notified before sending samples. Specimen collect date and time must be provided on request form. Samples must be received in Laboratory, separated and frozen within **24 hrs** of venepuncture.	10 – 18 days
	Urine	None	4.5	Sterile Universal Container	Please send to laboratory immediately as sample must be sent frozen to referral lab	
Dengue Antibodies *	Blood	None	5.5	Red top vacuette serum tube	Please provide clinical details including comprehensive travel history or following	18-24 days

Test/ Profile	Specimen Type	Additive required	Volume Required/ ml	Container Type	Special Requirements	Turnaround Times
* Specimens/ samples are referred to external laboratory for testing ** If sample needs to be sent to referral Lab for supplemental/ confirmatory testing Turnaround Time will be longer. Days are expressed as Calendar days.						
					prior consultation with Consultant Microbiologist.	
E.coli PCR	Blood	None	5.0	EDTA whole blood	Clinical details required: pre collection antibiotics, date of onset, primary diagnosis, clinical details, lab findings.	
Echinococcus antibodies (Hydatid Cyst / Cystercercosis Ab) *	Blood	None	5.5	Red top vacuette serum tube	Only accepted following prior consultation with Consultant Microbiologist.	18-24 days
Endomysial Antibodies (EMA)*					See Coeliac Screen	
Epstein-Barr Virus (EBV) antibodies *	Blood	None	5.5	Red top vacuette serum tube		7 – 12 days
Epstein-Barr Virus PCR EBV DNA *	Blood	K EDTA	4.5	Purple top vacuette EDTA tube	Serology Lab must be notified before sending samples. Specimen collect date and time must be provided on request form. Samples must be received in Laboratory, separated and frozen within **24 hrs** of venepuncture	10 – 21 days
Farmers lung screen *	Blood	None	5.5	Red top vacuette serum tube		10 – 24 days
Galactomannan Assay*	Blood	None	5.5	Red top vacuette serum tube		Weeks
Gentamicin levels	Blood	None	5.5	Red top vacuette serum tube	Clinical details including site of infection, Time blood was collected, Dose	3-6 hours Gentamicin >5.0 phoned.

Test/ Profile	Specimen Type	Additive required	Volume Required/ ml	Container Type	Special Requirements	Turnaround Times
* Specimens/ samples are referred to external laboratory for testing ** If sample needs to be sent to referral Lab for supplemental/ confirmatory testing Turnaround Time will be longer. Days are expressed as Calendar days.						
					schedule, When last dose was given, should be clearly indicated on request form. See SHARx App **Desirable Levels:** Gentamicin (pre-dose): <1mg/L.	Testing performed in Biochemistry
Group B streptococcal PCR	Blood	K EDTA	4.5 adult 1.5 paed	Purple top vacuette EDTA tube	Please state on request form if patient was on antibiotic prior to sample collection, clinical details, date of onset of symptoms	If sample received in referral lab before 11 AM preliminary verbal report can be issued same day.
Haemophilus influenzae b antibodies (HIB) *	Blood	None	5.5	Red top vacuette serum tube		15-24 days
Haemophilus PCR *	Blood	K EDTA	4.5 adult 1.5 paed	Purple top vacuette EDTA tube	Please state on request form if patient was on antibiotic prior to sample collection, clinical details, date of onset of symptoms	If sample received in referral lab before 11 AM preliminary verbal report can be issued same day.
Hepatitis A IgM (Acute infection)	Blood	None	5.5	Red top vacuette serum tube		2 – 6 days
Hepatitis A IgG (Immunity/ Past infection) *	Blood	None	5.5	Red top vacuette serum tube		7 – 14 days
Hepatitis B surface antigen (HBsAg)	Blood	None	5.5	Red top vacuette serum tube		2 – 6 days

Test/ Profile	Specimen Type	Additive required	Volume Required/ ml	Container Type	Special Requirements	Turnaround Times
* Specimens/ samples are referred to external laboratory for testing ** If sample needs to be sent to referral Lab for supplemental/ confirmatory testing Turnaround Time will be longer. Days are expressed as Calendar days.						
Acute Infection **						
Anti-HBs (Hepatitis B Immunity/ Vaccination)	Blood	None	5.5	Red top vacuette serum tube	Please provide vaccination history. For information on HBV vaccine schedule/ post vaccination testing refer to Immunisation Guidelines at www.hse.ie/eng/health/immunisation/hcpinfo/guidelines - Chapter 9 Hepatitis B	2 - 6 days
Anti-HB core (Evidence of past infection) *	Blood	None	5.5	Red top vacuette serum tube		7 – 12 days
Hep B markers: Anti-HBe, HBeAg, Anti Hep B core specific IgM	Blood	None	5.5	Red top vacuette serum tube		7 – 12 days
Hepatitis B viral load, HBV DNA *	Blood	K EDTA	4.5	Purple top Vacuette EDTA tube	Specimen collect date and time must be provided on request form. Samples must be received in Laboratory, separated and frozen within **24 hours** of venepuncture and Serology Lab notified before blood is taken.	10 – 21 days
Hepatitis C serology **	Blood	None	5.5	Red top vacuette serum tube		2 – 6 days
Hepatitis C Ag *	Blood	None	5.5	Red top vacuette serum tube		5-12 days

Test/ Profile	Specimen Type	Additive required	Volume Required/ ml	Container Type	Special Requirements	Turnaround Times
* Specimens/ samples are referred to external laboratory for testing ** If sample needs to be sent to referral Lab for supplemental/ confirmatory testing Turnaround Time will be longer. Days are expressed as Calendar days.						
HCV Genotype *	Blood	K EDTA OR None	4.5 5.5	Purple top Vacuette EDTA tube Red top vacuette serum tube	Specimen collect date and time must be provided on request form. Samples must be received in Laboratory, separated and frozen within **24 hours** of venepuncture and Serology Lab notified before blood is taken.	10 – 24 days
HCV PCR/ viral load *	Blood	KEDTA OR None	4.5 5.5	Purple top Vacuette EDTA tube Red top vacuette serum tube	Specimen collect date and time must be provided on request form. Samples must be received in Laboratory, separated and frozen within **24 hours** of venepuncture and Serology Lab notified before blood is taken.	10 – 24 days
Hepatitis delta antigen *	Blood	None	5.5	Red top vacuette serum tube	Requests only accepted from patients with documented Hepatitis B infection	Weeks
Hepatitis E *	Blood	None	5.5	Red top vacuette serum tube	Not part of Hepatitis Screen. Please specify on request form if Hepatits E is required.	7-12 days
Herpes simplex antibodies *	Blood	None	5.5	Red top vacuette serum tube		10 – 18 days
Herpes simplex PCR*	Blood	KEDTA OR	4.5	Purple top Vacuette EDTA tube	Specimen collect date and time must be provided on request form. Samples must be received in Laboratory, separated	

Test/ Profile	Specimen Type	Additive required	Volume Required/ ml	Container Type	Special Requirements	Turnaround Times
* Specimens/ samples are referred to external laboratory for testing ** If sample needs to be sent to referral Lab for supplemental/ confirmatory testing Turnaround Time will be longer. Days are expressed as Calendar days.						
		None	5.5	Red top vacuette serum tube	and frozen within **24 hours** of venepuncture and Serology Lab notified before blood is taken.	
HIV 1 / 2 Abs + p24 Ag **	Blood	None	5.5	Red top vacuette serum tube		2 – 6 days (PTWIP)
HIV confirmatory tests *	Blood	None	5.5	Red top vacuette serum tube		5 – 12 days
HIV Genotypic antiviral resistance testing	Blood	K EDTA	2 X 4.5	Purple top vacuette EDTA tube	Specimen collect date and time must be provided on request form. Samples must be received in Laboratory, separated and frozen within **24 hours** of venepuncture and Serology Lab notified before blood is taken.	16-24 Days
HIV viral load *	Blood	K EDTA	2 X 4.5	Purple top vacuette EDTA tube	Specimen collect date and time must be provided on request form. Samples must be received in Laboratory, separated and frozen within **24 hours** of venepuncture and Serology Lab notified before blood is taken.	10 – 24 days
HTLV	Blood	None	5.0	Red top vacuette serum tube		
Influenza virus *	Nasopha -ryngeal aspirate, Viral nasal/	None	4.5	Sterile Universal Container or viral swab	Send to Microbiology Laboratory	5-12 days

Test/ Profile	Specimen Type	Additive required	Volume Required/ ml	Container Type	Special Requirements	Turnaround Times
* Specimens/ samples are referred to external laboratory for testing ** If sample needs to be sent to referral Lab for supplemental/ confirmatory testing Turnaround Time will be longer. Days are expressed as Calendar days.						
	Throat sample					
JC Virus*					See polyomavirus	
Leptospiral screen *	Blood	None	5.5	Red top vacuette serum tube		10 – 18 days
Measles antibodies (IgM + IgG) *	Blood	None	5.5	Red top vacuette serum tube		10 – 18 days
Meningococcal antibodies *	Blood	None	Paed 1.5 (0.2-0.5 ml serum)	Red top vacuette serum tube	Please specify which serogroups to be tested quadrivalent vaccine for Meningococcal A, C, W, Y and/ or Meningococcal serogroup B	Variable, 2 – 6 months
Meningococcal PCR*	Blood	K EDTA		Purple top vacuette EDTA tube	Clinical details required: Pre collection antibiotics, date of onset, primary diagnosis, clinical details and lab findings	
Monospot (Glandular fever)	Blood	None	5.5	Red top vacuette serum tube		1 - 3 days
Mumps antibodies (IgM + IgG) *	Blood	None	5.5	Red top vacuette serum tube		10 – 18 days
Mumps RNA*	Swab	None		Saliva foam swab	Send to Microbiology Laboratory	
Mycoplasma pneumoniae antibodies *	Blood	None	5.5	Red top vacuette serum tube	NVRL will test Mycoplasma IgM for patients under the age of 20. For patients >/= 20 years old prior discussion is required with Consultant Microbiologist as these	10 – 18 days

Test/ Profile	Specimen Type	Additive required	Volume Required/ ml	Container Type	Special Requirements	Turnaround Times
* Specimens/ samples are referred to external laboratory for testing ** If sample needs to be sent to referral Lab for supplemental/ confirmatory testing Turnaround Time will be longer. Days are expressed as Calendar days.						
					samples are sent, to UK for analysis. **Viral swab for influenza is preferred sample.**	
Neisseria meningitidis PCR *	Blood	K EDTA	4.5 adult 1.5 paed	Purple top vacuette EDTA tube	Please state on request form if patient was on antibiotic before taking sample, Clinical details, Date of onset of symptoms	If sample received in referral lab before 11 AM preliminary verbal report can be issued same day.
Parvovirus B19 serology *	Blood	None	5.5	Red top vacuette serum tube		10 – 18 days
Parvovirus B19 DNA	Blood	K EDTA	5.5	Purple top vacuette EDTA tube	Sample requires freezing within 24hrs of venipuncture. Collection date and time required.	
	Swab			Buccal swab		
Pneumococcal antibodies *	Blood	None	5.5	Red top vacuette serum tube	Relevant clinical details or following prior consultation with Consultant Microbiologist	15-24 days
Pneumococcal PCR *	Blood	K EDTA	4.5 adult 1.5 paed	Purple top vacuette EDTA tube	Please state on request form if patient was on antibiotics prior to sample collection, clinical details, date of onset of symptoms	If sample received in referral lab before 11 AM preliminary verbal report can be issued same day
Polyomavirus (JC, BK) PCR *	Blood	None	5.5	Red top vacuette serum tube	Specimen collect date and time must be provided on request form and sample. Blood Sample must be	10-24 days

Test/ Profile	Specimen Type	Additive required	Volume Required/ ml	Container Type	Special Requirements	Turnaround Times
* Specimens/ samples are referred to external laboratory for testing ** If sample needs to be sent to referral Lab for supplemental/ confirmatory testing Turnaround Time will be longer. Days are expressed as Calendar days.						
	CSF Urine			Sterile Universal Container	received and frozen within 24 hours of venepuncture. Urine sample must be frozen within 24 hrs of collection	
Rubella IgG	Blood	None	5.5	Red top vacuette serum tube		2-6 days
Rubella IgM *	Blood	None	5.5	Red top vacuette serum tube		7-12 days
Schistosomal antibodies * (Primarily screened on urine in microbiology)	Blood	None	5.5	Red top vacuette serum tube	Relevant clinical details or following prior consultation with Consultant Microbiologist	15-24 days
Staphylococcal antibodies *	Blood	None	5.5	Red top vacuette serum tube	Test currently suspended	
Syphilis screen (*Treponema pallidum*) **	Blood	None	5.5	Red top vacuette serum tube		2-6 days
Teicoplanin level (Trough) *	Blood	None	5.5	Red top vacuette serum tube	Not routinely processed. Discuss with Consultant Microbiologist.	3– 7 days for phoned result
Tobramycin Level *	Blood	None	5.5	Red top vacuette serum tube	Not routinely processed. Discuss with Consultant Microbiologist.	2 – 4 days for phoned result
TORCH Screen					See individual assays	
Toxocara antibodies *	Blood	None	5.5	Red top vacuette serum tube		15-24 days

Test/ Profile	Specimen Type	Additive required	Volume Required/ ml	Container Type	Special Requirements	Turnaround Times
* Specimens/ samples are referred to external laboratory for testing ** If sample needs to be sent to referral Lab for supplemental/ confirmatory testing Turnaround Time will be longer. Days are expressed as Calendar days.						
Toxoplasma screen *	Blood	None	5.5	Red top vacuette serum tube		7-12 days
Tissue Trans-glutaminase					See Coeliac Screen	
Vancomycin levels	Blood	None	5.5	Red top vacuette serum tube	Site of infection, Collect time of sample, Dose schedule, When last dose was given, should be clearly indicated on request form. See SHARx App **Desirable Levels:** Vancomycin (trough): Aim for 10-15mg/L. For serious infection,eg septicaemia, endocarditis osteomyelitis etc.: Aim for 15-20mg/L	2 hrs Results only phoned to wards if Vancomycin level is > 20 mg/L Test performed in Biochemistry
Varicella Zoster Virus (VZV) antibodies	Blood	None	5.5	Red top vacuette serum tube		2-6 days
Viral Screen (not processed as specific tests must be requested)	Tests MUST be specified and clinical details provided. Refer to NVRL handbook. Clinical team in NVRL can be contacted at 01 7164418 if advice is required					
West Nile Virus *	Blood	None	5.5	Red top vacuette serum tube	Relevant clinical details with travel history or following prior consultation with	10- 18 days

Test/ Profile	Specimen Type	Additive required	Volume Required/ ml	Container Type	Special Requirements	Turnaround Times
* Specimens/ samples are referred to external laboratory for testing ** If sample needs to be sent to referral Lab for supplemental/ confirmatory testing Turnaround Time will be longer. Days are expressed as Calendar days.						
					Consultant Microbiologist.	
Widal test	Discontinued. Does not meet criteria for diagnostic test. No longer available in this country.					
Yellow fever IgM	Blood	None	5.5	Red top vacuette serum tube		
Yersinia antibodies *	Blood	None	5.5	Red top vacuette serum tube	Test discontinued. The recommended method for the diagnosis of suspected Yersiniosis is the culture of Yersinia species from faecal specimens.	
Zika virus/Zika PCR/Zika RNA	Blood	None	5.5	Red top vacuette serum tube	Symptomatic patients with appropriate travel history within 14 days. Discuss with consultant microbiologist. Sample must be frozen within 24 hours of venipuncture.	

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29. Public Health Laboratory

Public Health Laboratory
Pathology Department
Sligo University Hospital
Sligo

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Hours of Operation	Monday- Friday	09:00-17:00
Phone	Main Laboratory	071 917 4558

The Public Health Laboratory (PHL), a subsection of the Clinical Microbiology Department, is designated as an Official Food Microbiology Laboratory (OFML), under EU Regulation 2017/625.

It provides a regional service for the routine, and non-routine analysis of Food, Water and Environmental samples submitted by the Environmental Health Officers of the Health Service Executive (HSE) North Western Area and local services including various in-house hospital departments (Endoscopy, Pharmacy, Theatre), as well as other community hospitals under the approval of the Consultant Microbiologist.

PHL is a testing laboratory accredited by the Irish National Accreditation Board (INAB) registration number 098T, and complies with the requirements of the International Standard ISO 17025:2017 and the Regulations for INAB Accredited Organisations, including INAB Terms and Conditions. Detail of the scope of accreditation can be viewed on the INAB website www.inab.ie

PHL also reports to the Food Safety Authority of Ireland (FSAI) which is responsible for the enforcement of food safety legislation in Ireland. This responsibility is discharged through a series of service contracts with official agencies, including a service contract between the FSAI and HSE North Western Area (PHL).

The Public Health Laboratory (PHL) provides a water and environmental testing service for the Environmental Health Service (EHS) that falls outside the Scope of the HSE-FSAI Service Contract. In these instances, a Request Form completed by an authorized officer ie EHO etc, is considered the contract between the PHL and EHS.

Bi-annual local Sampling Programme Meetings, attended by PHL Management and EHS Management, are held to discuss, review and agree local sampling plans. Sample types and test parameters are discussed and Microbiological Sampling Programme agreed.

FSAI-OFML-EHS Liaison groups agree Sampling Protocols for European, National and HSE Surveys.

Local Hospital meetings are held, if necessary, for other customers.

The functions of the Laboratory may be described as

- The analysis of food and water samples for food borne pathogens and indicator organisms
- Analysis of environmental samples for other departments in hospital settings eg Endoscopy, Theatre, catering.
- Participation in the investigation and control of the outbreak of illness suspected of arising from food, water or environmental contamination
- Provision of relevant expert advice and support to Environmental Health Officers, Authorised Officers and Public Health Physicians.

30. Histology and Cytology

Histology/Cytology Laboratory
Pathology Department,
Sligo University Hospital,
Sligo.

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Histology and Cytology Laboratory Index

Histology/Cytology Hours of Operation

Hours of Operation	Monday- Friday	0900-1700
Phone	Histology Laboratory	071 9174559
	Cytology Laboratory	071 9174173
Fax	071 9136871	

Histology Laboratory Staff Contact Details

Name	Job Title	Contact / Email
Mr. Liam O'Grady	Pathology Manager	Liam.ogrady@hse.ie Work 071 917 4560
Dr.Paul Hartel	Consultant Pathologist	Secretary 071 9174710/4554 Paul.Hartel@hse.ie
Dr. Erich Langner	Consultant Pathologist	Secretary 071 9174710/4554 erich.langner@hse.ie
Dr. Juan Carlos Saenz Rios	Consultant Pathologist	Secretary 071 9174710/4554 JuanCarlos.SaenzRios@hse.ie
Sinéad O'Rourke	Chief Medical Laboratory Scientist	sinead.orourke4@hse.ie 071 9174564
Elaine Logan	Senior Medical Scientist (Quality Officer)	elaine.logan@hse.ie 071 9174559

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Histology/Cytology General Information

The Pathology Department located on level 4 above the Out Patients Department and the North West Hospice. The Histology/Cytology laboratory is located in the Pathology Department, right past Central Reception, next right to Histology/Cytology.

Any deviations from Histology/Cytology Specimen Acceptance Criteria (see below) are recorded as non-conformances, corrective and preventive actions implemented and follow-up monitoring implemented.
If there is any doubt, on review of information provides here, about how to handle a specimen please contact the laboratory, assistance is provided by Senior Scientific staff. In addition, feedback on the content of this document would be of great assistance to the Histology/Cytology Quality Management team. Consultant Pathologists provide information to requesting physicians with regard to clinical indicators and/or the frequency of repeat specimens, if relevent. The possibility of further examination of a primary specimen previously submitted can be discussed with either the Consultant Pathologist.

The request for urgent analysis must be used appropriately. Abuse of the urgent request facility will have an adverse effect on the turnaround times of genuinely urgent requests. For urgent requests indicate that the examination of the specimen is urgent by handwriting “urgent” on the Histopathology request form. Alternatively, contact the Histology laboratory to indicate the priority of the sample has changed to urgent. Ensure a contact number /bleep is on the Histopathology request form for verbal communication of the Consultant Histopathologist report. Such samples will receive priority reporting by the Consultant Histopathologist. Unexpected results are communicated to the requesting Consultant by the Consultant Histopathologist. For external users, please provide a contact number for phoning urgent results.

Histology/Cytology examination procedures are limited by the quality of the sample received. Appropriate handling and transportation of specimens from all location to the laboratory is essential to ensure safe delivery of same. All samples must be transported in sealed leak-proof containers. Formalin Histopots should be sealed in the envelope portion of the Histology/Cytology request form. All Histology/Cytology specimens are delivered directly to the Histology/Cytology laboratory, Pathology Central Reception must be by-passed, and specimens are DATE/TIME stamped on receipt in the laboratory. Refer to QPulse; S-CLN-TH-008 Care and Handling of Specimens in General Theatre, Orthopaedic Theatre and Day Services. Specimens must be stored according to hospital policy.

Histology/Cytology reports are issued to the requesting physician as identified on the Histology/Cytology request form submitted. Ensure the addresograph labels used are from the current admission. Ensure episode/event corresponds to the clinician who is to receive the report, and no other clinician is referenced on the request form. Reports are also available to requesting physicians in electronic format on CoPath under restricted access.

The department employs rigorous internal quality procedures to ensure a high level of quality is maintained. The Pathology Department participates in relevant available external third party assessment schemes. This includes

schemes operated by: NEQAS (UK, National External Quality Assurance Scheme) NordiQC (Nordic Immunohistochemical Quality Control (NordiQC), College of American Pathology (CAP).

Histology/Cytology Specimen Acceptance Criteria
All specimens for routine Histology should be submitted in 10% neutral buffered formalin, in a suitably sized, leak proof container. The container should hold at least three times the volume of fixative in ratio to the size of the specimen to ensure adequate fixation. Formalin Histopots (red-top) should be used at specimen collection for all biopsies and small tissue specimens. Larger Histology specimens should be submitted in a disposable container for surgical specimens. Specimens for Cytology should be submitted fresh in a sterile screw-top container or Cytolyte fixative pre-filled containers. Larger volume Cytology specimens should be submitted in multiple 20ml universal containers.

The specimen container must be clearly labeled with 3 patient identifiers; Name (surname, first name), Date of Birth, and PCN or address. The specimen type/ anatomic site must also be recorded on the specimen container body, if also labeling specimen container lid- the lid and body container labeling must match. Include further descriptive terms (e.g. left, right), as required, to uniquely identify the specimen. Larger specimen containers should be submitted with patient identification labels on both the body and lid of the container. Do **not** selotape the request form to the specimen container for labeling purposes.

A completed Histology/Cytology request form (purple form, doc.no.68444) must accompany the specimen.
A complete request form must include patient's name (surname, first name), Date of Birth, and PCN or address. Gender, location, name of requesting physician, pertinent clinical information, specimen description, preoperative and/or postoperative diagnosis, date and time the specimen was taken and signature and contact details of requesting physician. In the case of an outside patient the include patient's name (surname, first name), Date of Birth, and PCN or address. The specimen description must be given on both the specimen and request form. Where specimens are collected at a clinic, a clinic specimen list accompanies the specimens to the laboratory, all patient and specimen identification details recorded on this list must match the specimen container(s) and request form. Failure to provide the minimum data required on the Histopathology/Cytology Request form will result in a delay in processing the sample.

The specimen type and anatomical site are particularly important in Histopathology where specimens may be multipart or left or right etc. Failure to submit essential information will result in a delay in specimen processing pending amendments being made to request forms or specimens. This may cause unnecessary delays in issuing reports.

Specimens and/or request forms that are not properly completed will not be processed. The person who takes the sample will be contacted and asked to come to the laboratory to complete the labeling requirement, to permit specimen acceptance.

Histology/Cytology specimens should be labeled at the time of specimen collection, according to local collection procedures for patient/ specimen/ test request identification checks. The Histology/Cytology request form should be completed by the requesting physician at the time of specimen collection.
Histology/Cytology request forms (document number 68444) fixative and specimen containers can be obtained at the Laboratory by contacting the porter on duty Bleep 188.

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List of Histology Specimens and their Requirements

The specimen description, as documented by the clinician on the Histology/Cytology request form, is essential for the appropriate examination procedures relating to it. This description also forms part of the final diagnostic report and consequently the medical record of the patient. Therefore the accuracy of this description is an essential part of the request. There is a separate part of the request form for the procedure, previous history and clinical details. Ensure the requisition form is completed fully and legibly. All anatomic parts and tissues removed are taken to the Histology laboratory.

Test	Specimen (Part) Type	Additive and amount required	Container type	Special requirements
Small biopsies for Histology	Endoscopic, skin, core/needle biopsies (prostate breast, lung etc.) curettings etc.	10% Neutral Buffered Formalin (NBF)	Prefilled 40 ml containers with lid firmly closed	Store at room temperature, DO NOT place in refrigerator.
Larger biopsies or organs for Histology	Fixed tissue Resections, larger biopsies, organs etc	10% NBF. Bulk liquid is available from the Histology Laboratory. Ensure specimen is fully immersed in liquid	Select appropriately sized Histology container (available from the Pathology Laboratory) with the lid securely closed	Store at room temperature, DO NOT place in refrigerator.
Frozen section for Histology	Fresh tissue	None Do Not Immerse in Fluid	Appropriately sized empty Histology container with lid securely closed	Prior to procedure- inform Pathologist on-duty and laboratory to advise and ensure appropriate staff are available. Adhere to the standard safety precautions for infectious material. Transport immediately to the laboratory

Test	Specimen (Part) Type	Additive and amount required	Container type	Special requirements
Genetic studies*	Paraffin embedded tissue	N/A	N/A	Pathologist selected on request
Cytogenetic studies**	Fresh tissue	RPMI+ATB transport media	Specific container supplied by Eurofins Biomnis laboratories	Eurofins Biomnis request form and patient consent form must be completed prior to specimen collection
Immunophenotyping/Flow Cytometry*	Cerebrospinal fluids/Fine needle aspirations	RPMI transport media	Prefilled 20ml containers available from Histology	Dispense fluid directly into the 20ml prefilled container at procedure

* and** These tests are referred to outside laboratories for analysis.
** Eurofins Biomnis RPMI transport medium, Cytogenetics request form and Patient consent form are available online, www.eurofins.ie. The report will go to requesting Clinician.

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List of Cytology Specimens and their Requirements

Diagnostic cytology involves the study of cells recovered from aspirated samples or from other body fluids.

Specimen type	Container Type	Special Requirements
Ascitic Fluid	Sterile screw capped container	Send an aliquot of the fluid. Do not send bags
Bronchoalveolar lavage (BAL)/ brushing	Sterile screw capped container or Cytolyte fixative pre-filled container	
Cyst Fluid	Sterile screw capped container	
Cerebrospinal fluid (CSF)	Sterile screw capped container	
Fluids: Pleural / Pericardial / Peritoneal etc.	Sterile screw capped container	Send an aliquot of the fluid. Do not send bags

Specimen type	Container Type	Special Requirements
Synovial Fluid	Sterile screw capped container	
Fine Needle Aspirate (FNA)	For fluids: Cytolyte fixative pre-filled container For slides: Pencil labelled slides in slide mailer	Submit air dried and wet fixed slides labelled with mode of fixation and patient's name, DOB and PCN
Urine for fat globules	Sterile screw capped container	Transported to laboratory immediately
Urine for Cytology	Sterile screw capped container or Cytolyte fixative pre-filled container	2nd whole voided urine of the day after exercise

Specimens for Cytology must be delivered as quickly as possible to the laboratory as fresh samples are essential for accurate diagnoses. Specimens must be labeled are per Specimen Acceptance criteria (above) and sent in screw-capped, leak proof containers. Large volume fluid specimens must be collected in multiple screw-capped containers, each one labeled as per Specimen acceptance criteria.

A fully completed Histology/Cytology request form (purple, doc.no.68444) must accompany the specimen. A completed request form includes include patient's name (surname, first name), DOB, and PCN or address, location, name of requesting physician, date and time specimen was taken and signature and contact details of requesting physician and include source of specimen, patient history, details of previous Cytology or Histology investigations and details of ongoing or recent treatment.
Specimens and/or request forms that are not properly labelled will not be processed. The person who takes the sample will be contacted and asked to come to the laboratory to complete the labelling required. Only then will the sample be processed.

A completed purple Histology/Cytology request form must be submitted with all specimens for Cytology. However, an exception to these specimen acceptance criteria is permitted in the case of a limited fluid specimen for Cytology where other examinations e.g. c&s, are also required on the specimen. In this situation a request form other than the purple Histology/Cytology form is acceptable.
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Fine Needle Aspirates (FNAs)

Slides must first be labelled, using a hard lead pencil, giving the include patient's name (surname, first name), DOB, and PCN and mode of fixation for that slide. This laboratory requires samples of both air-dried and wet-fixed material.

- Air - dried smears
- Wet fixed smears should be immersed in 95% alcohol (available from the Histology lab) immediately.

In addition, the material in the needle may be flushed out using 5 –10 mls of sterile saline. Please dispose of the needle after flushing. The specimen must be transported immediately to the Cytology laboratory in an appropriately labelled, screw-capped container.
A fully completed request form (PURPLE) must accompany the specimen. A complete requisition form includes patient's name (surname, first name), DOB, and PCN or address. Location, name of requesting physician, date and time specimen was taken and signature and contact details of requesting physician. Source of specimen, patient history, details of previous cytology or histology investigations and details of ongoing or recent treatment should be included.

Specimens and/or request forms that are not properly labeled will not be processed. The person who takes the sample will be contacted and asked to come to the laboratory to complete the labeling required. Only then will the sample be processed.

Materials used in primary sample collection are disposed of in accordance with SUH policy and procedure QPulse COR-WAS-001 Sligo Regional Waste Management Policy

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Turnaround Times (TaT'S)

TaTs are calculated based on the date and time of accessioning on receipt in the laboratory, to the date and time of report issuing. We aim to adhere to the published TaTs, as defined below, for 80% of Histology specimens accepted for processing.

Specimen Type	Times to issuing of report
All large cancer specimens; resection and excision	80% 10 Working Days
All other large non-cancer specimens	80% 15 Working Days
All small specimens; Biopsies (excluding weekend clinics)	80% 15 Working days
Prostate Biopsies	80% 10 Working days
Cytology specimens	80% 7 Working days
Urgent samples	Contact duty pathologist

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Storage and Disposal of Specimens

Examined specimens are stored in the Histology/Cytology Laboratory under controlled conditions. Histology samples, with excess tissue, are disposed of 30 days post the final sign out of report.
Fixed liquid cytology preparations are retained for up to 21 days post preparation.

Requests for additional examinations may be made up to this time by contacting the pathologist on duty.

Disposal of other materials
Formalin and other chemicals used in this service are disposed of using controlled conditions. If disposal of these chemicals are required they must be returned to the laboratory where they will be disposed of in accordance with the policies of the laboratory.

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Autopsy Service

Dr Paul Hartel Dr Erich Langner Dr. Juan Carlos Saenz Rios	Consultant Pathologist	Secretary 071 9174554

Mortuary Hours of Operation

Hours of Operation	Routine Service Monday-Friday 0830 - 1700

Mortuary Staff Contact Details

Name	Job Title	Contact / Email
Elaine Harrison	Senior Anatomical Pathology Technician	Work 071 9174451 Or via switchboard Elaine.Harrison1@hse.ie

To Request a Hospital Autopsy

Consent for Autopsy Form must be signed by as close a relative to the deceased as possible. The form is then filed in the patient's chart and kept at ward level
Ensure the chart and all details are available prior to the performance of the autopsy
Contact the Anatomic Pathology Technician Ext. 4451 or 087 6790113 to give details, have the case accepted and arrange a time for the autopsy
Contact the Medical Secretary at 4554/4710 to have the case accepted
Arrange to have the body transported to the Mortuary by contacting the porter on duty via the Hospital switchboard

Autopsy on patient with infectious disease

Autopsies on patients with infectious disease i.e. Tuberculosis, Hepatitis etc. are NOT performed at this facility.
Note: Body bags are available at the Mortuary if necessary.

Autopsy on Still births and foetuses

The arrangements for autopsy are made as for a deceased adult. Deceased babies over 24 weeks gestation must have Consent for Autopsy form signed by a parent. If appropriate, please ensure that the placenta either accompanies the body to the mortuary or is sent to Galway University Hospital Perinatal from the ward for examination.
Arrangements for disposal or funeral must be made with the parent(s).

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Amputation of a Limb

Amputated limbs may be disposed of by the hospital or can be removed by the patient/relative for burial. Please ensure that the patient before surgery signs the appropriate form.

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Procedure for dealing with Coroner's Cases

When a death occurs in circumstances that require notification to the Coroner:

DO NOT REQUEST THE NEXT OF KIN TO SIGN A HOSPITAL AUTOPSY PERMISSION FORM

DO NOT COMPLETE A DEATH CERTIFICATE
The doctor should report the case to the Coroner.
Coroner for Sligo/Leitrim is Mr.Fergal Kelly
Stephen House,
Stephen Street,
Sligo
Phone: 071 9146800

31. Laboratory Information System

Laboratory Information System (LIS) Office
Pathology Department
Sligo University Hospital
Sligo

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Laboratory Information System Index

Hours of Operation

Hours of Operation	Routine hours only Monday-Friday	0900-1700	
Primary Contact		LabInfo.SystemsNW@hse.ie	
Phone	Lindsey Lindsay	LIS Manager	Ext 74565
Phone	Siobhan McHugh	LIS Assistant Manager	Ext 76824

Please note: As not all phone calls may be answered, it is advisable to submit enquiries to the email given above.

Pathology Reports

This laboratory aims to perform the laboratory tests and send interim and final reports out as promptly as possible. The Pathology Department is served by a 2 fully integrated Laboratory Information Systems (LIS--Sunquest),

- Sunquest Laboratory, covers, Biochemistry, Blood Transfusion, Haematology and Microbiology.
- CoPath Plus, covers Histology/Cytology.

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 (particularly on Haematology and Biochemistry Pathology reports). Reference ranges for each test are shown in the departmental sections. Please contact the Consultants or other senior laboratory staff to discuss any further interpretations or doubts that may arise from the reports.

Printed Reports

Reports are printed with reference ranges and or suitable comments whenever appropriate to aid interpretation of results. Reports will be addressed to requesting clinician.
Please note that the printed authorised report issued by the laboratory is a medico legal document within the patient record. Page number is indicated on the printed patient report. It is also indicated on the bottom of the printed reports as to whether or not a patients report is completed i.e. ‘End of report’ or there are additional pages to the report i.e. ‘Continued’.

Internal reports

Paper reports are printed throughout the day on paper specific for each Pathology Department These reports are sorted into requesting source by pathology clerical staff and sent via the pneumatic chute system or alternatively are hand delivered to the appropriate location.

External reports

Test result reports for primary care practitioners and other users of the service are sent via the postal service. Referral test reports are returned directly to the requesting clinician by the referral laboratory. In general Sligo Pathology laboratories do not keep electronic copy of results. Any queries relating to referral tests should be made directly to the referral laboratory.

When doctors have taken note of the results it should be policy to ensure that all reports, whatever the results, are filed in the patient's case notes to provide a permanent record.

Emergency critical, abnormal and urgent results are phoned directly to wards or requesting clinician.

Electronic Reports
When Pathology results are authorised this information is available for viewing on the ward PCs throughout the Hospital. Some primary care sites have access to results electronically.
All locations receiving results electronically continue to receive hard copy.

Results can be accessed electronically using the LIS.
Tests are resulted with reference range displayed after result.
Tests that are displayed as pending are still due for processing.
NB: some tests are performed in batches, please refer to relevant departmental section for test details and turn around times.

Pathology results access

The user of Sunquest laboratory access will be responsible for the proper use of the facility. In order to comply with the HSE obligations under the data protection act 1988 and EU GDPR to protect the confidentiality of the patient record it is current hospital policy that any information viewable on Sunquest enquiry is not to be printed. In addition the information on Sunquest is only to be used by hospital staff for the purpose for which it is intended ie clinical management.
Information available from Sunquest enquiry must be used strictly in accordance with Sligo University Hospital Confidentiality policy.
If this facility is abused in any way, Sunquest enquiry may be withdrawn and disciplinary action may be taken.

Access to Microbiology Results

The Laboratory Information System was not designed for ward access to Microbiology results. The system allows access to incomplete and/or unauthorised results. If accessing the LIS to view microbiology results, the user MUST ensure he/she scrolls through ALL windows associated with the particular report in order to view all interpretations and comments and check the report status. Results with a report status of ‘pending’ are unauthorised and may be subject to change.

Accessing Sunquest Laboratory on Citrix at SUH

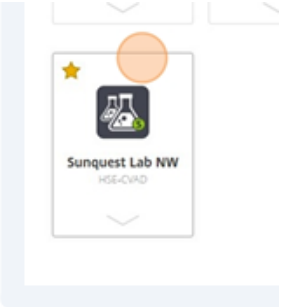
Access to the Sunquest Laboratory Information System is via Citrix

Log on to the Citrix Storefront (where you access iPMS and iCM)

1. Navigate to https://storefront.healthirl.net/Citrix/AppStoreWeb/

3. Log in with your personal account

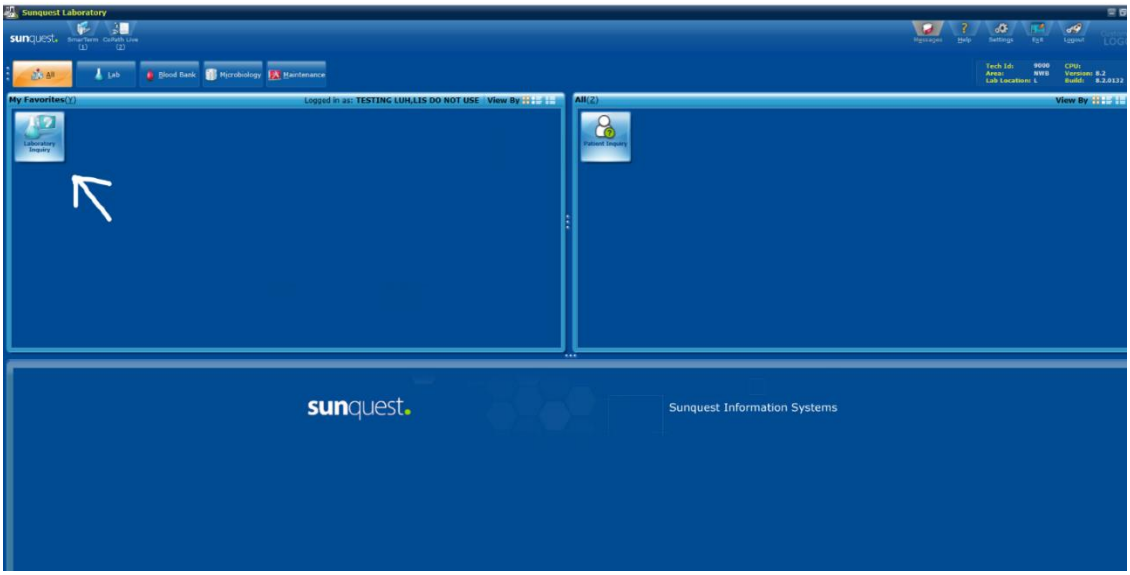
4. Click on the Sunquest Lab NW Icon



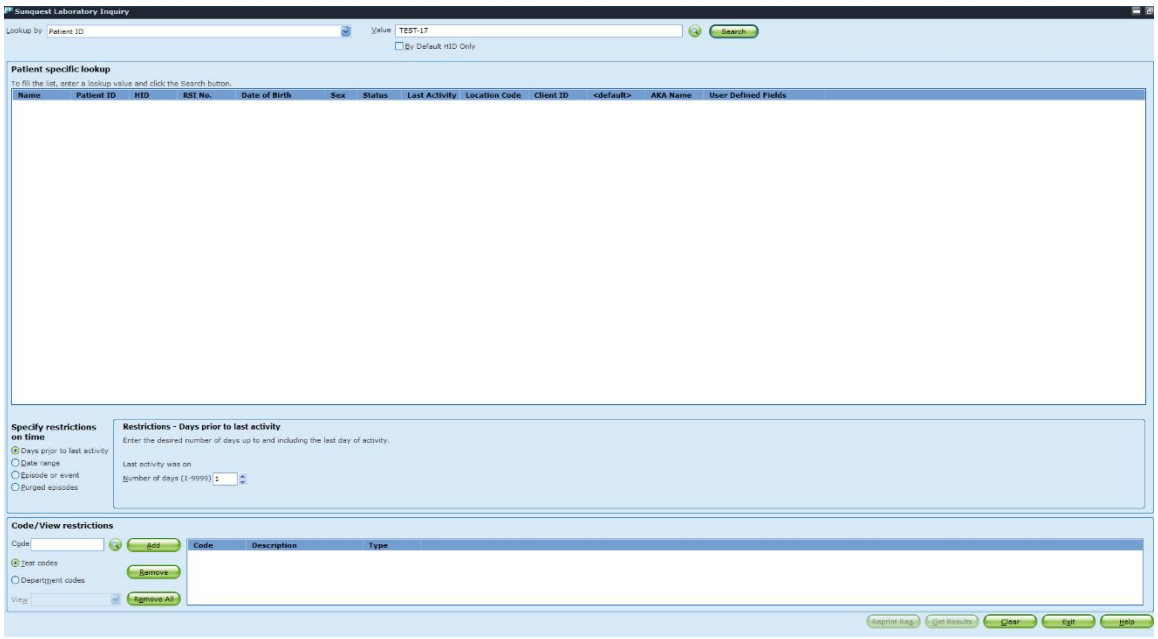
5. The Sunquest Laboratory Log in Screen will appear

5. Your USER ID (must be capitals) and PASSWORD is the same one you use in LAB73
LAB LOCATION is **S**

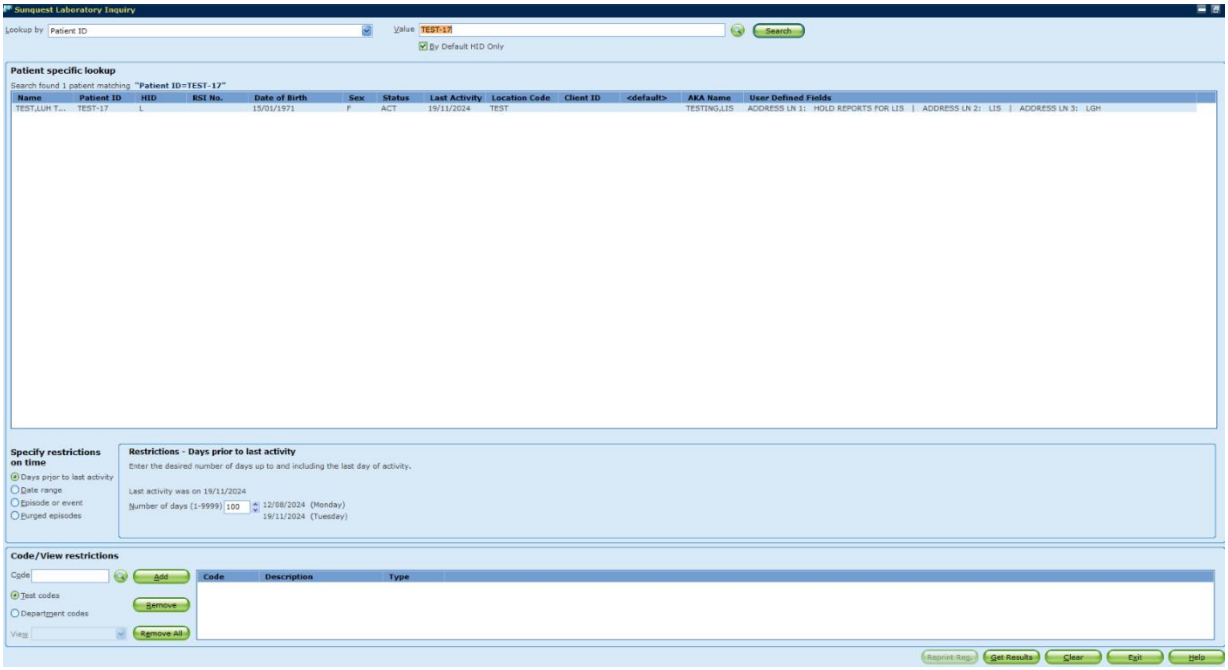
6. When the gateway launches you will see some application icons. You will choose Laboratory Inquiry.



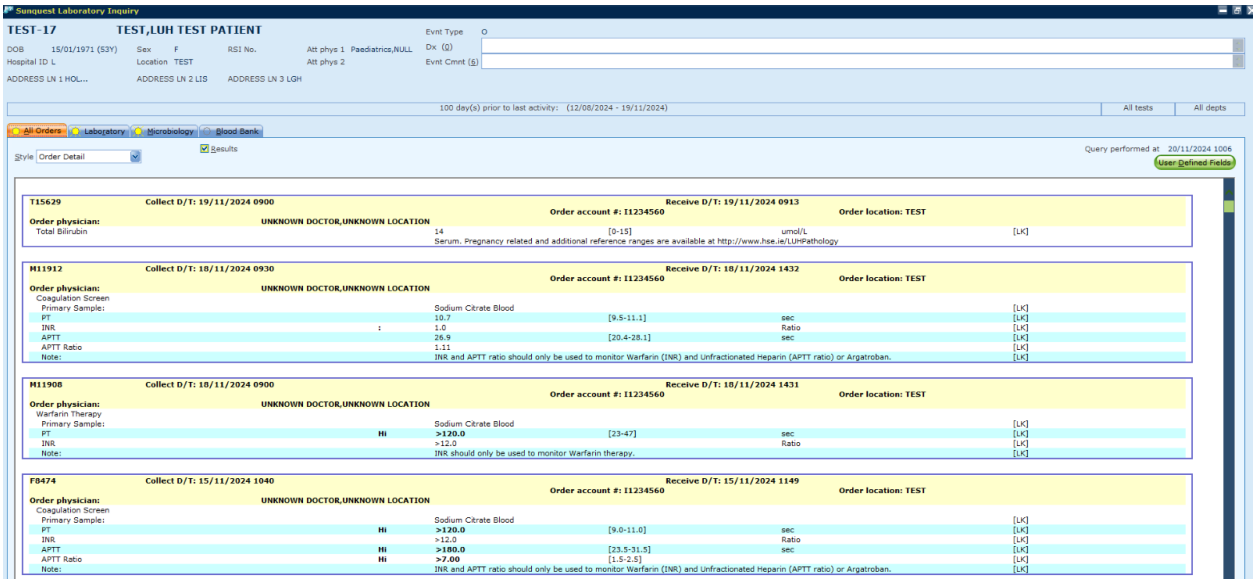
7. Enter your patient's PCN, and date range (up to 9999 days). You can use Date Range or by Episode but most used is Days Prior to Last Activity. Click **SEARCH**



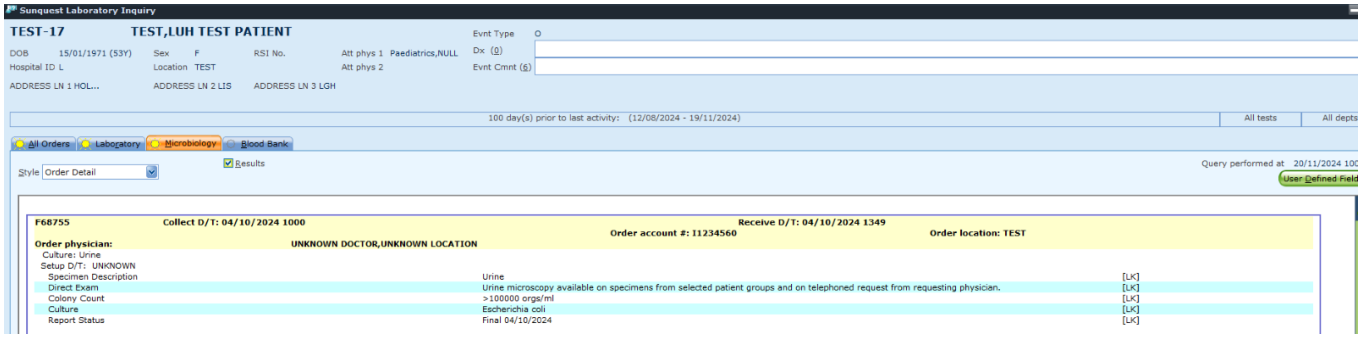
8. Confirm your patient's details and click **Get Results**



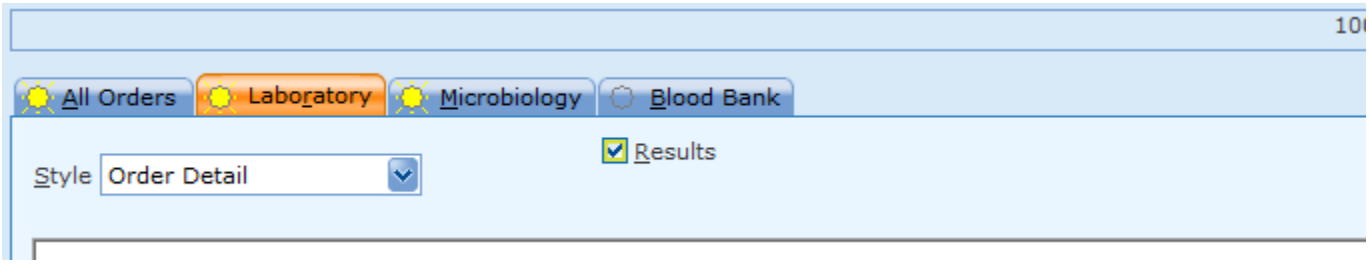
9. Access results on the All Orders Tab



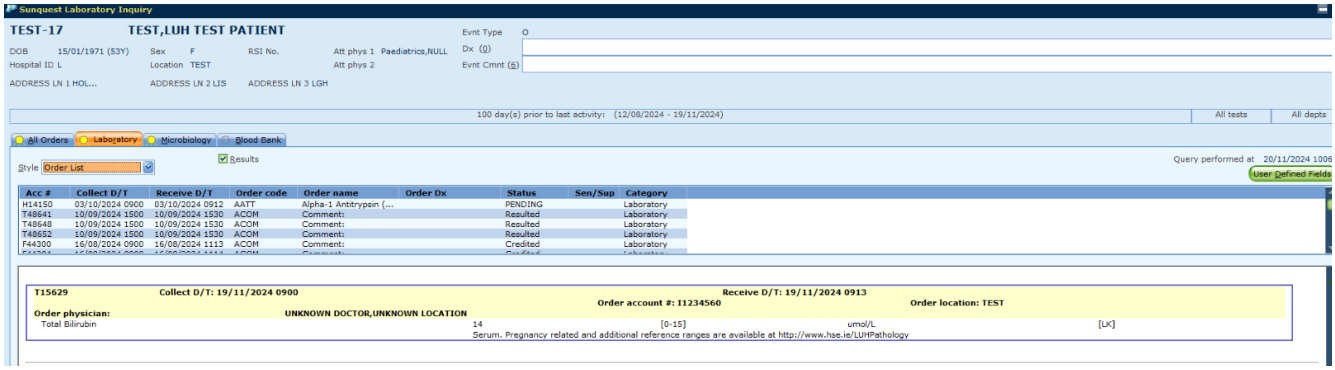
10. You can also access specific groups of tests in Micro (Culture results) or Blood Bank



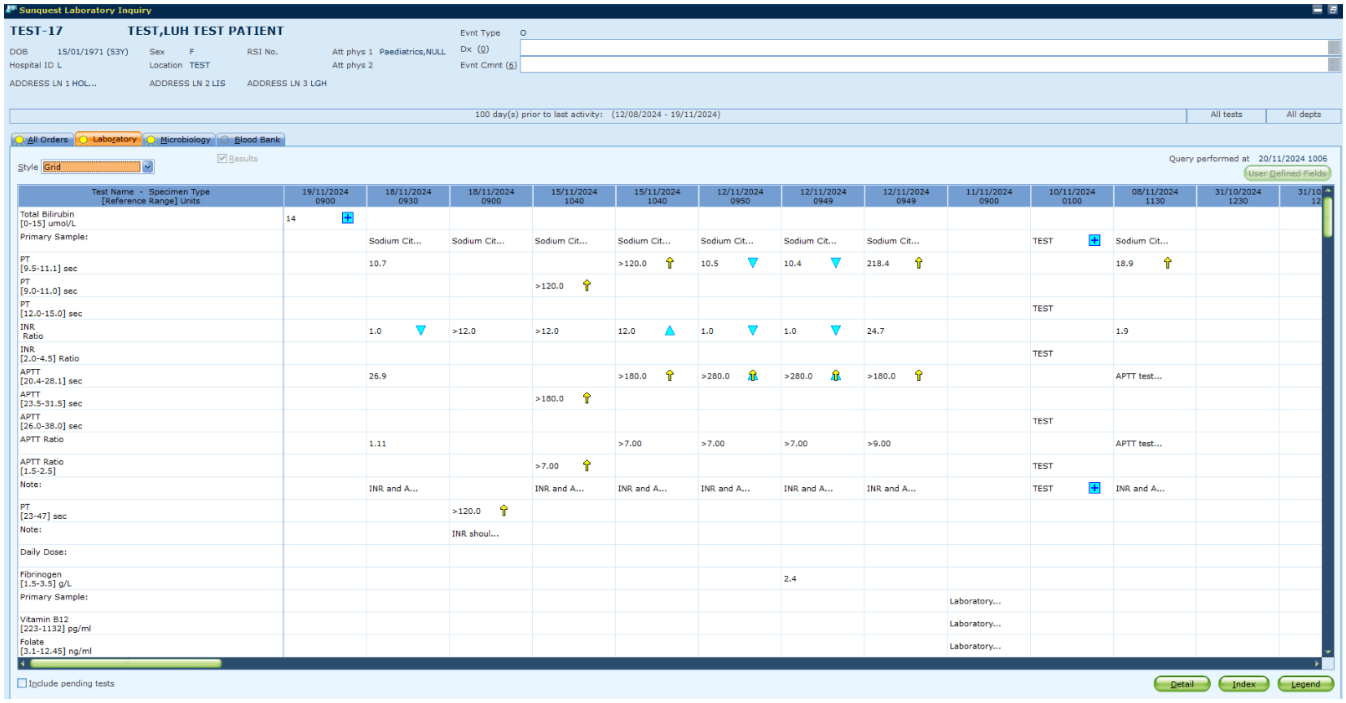
11. Under the **LABORATORY** tab, you have the option to access results by Order Detail, Order List, Grid and Graph.



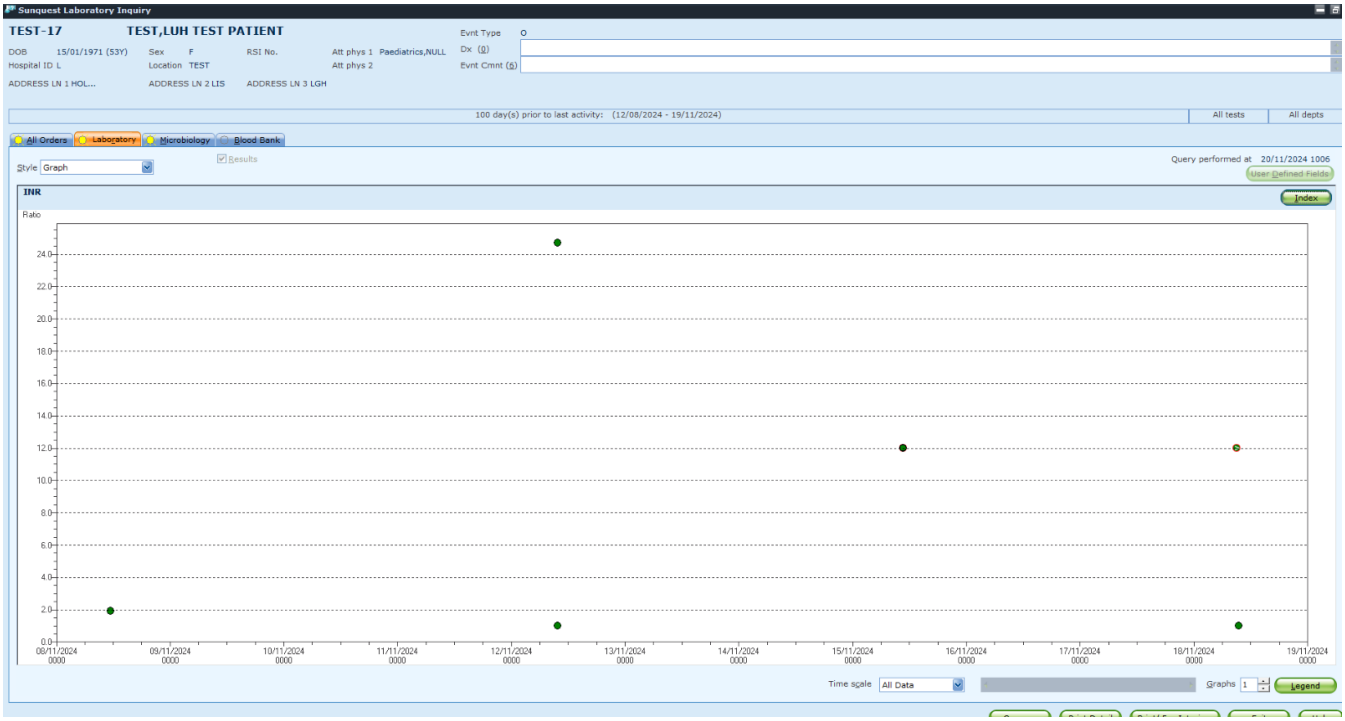
Order List (Click on individual orders to display)



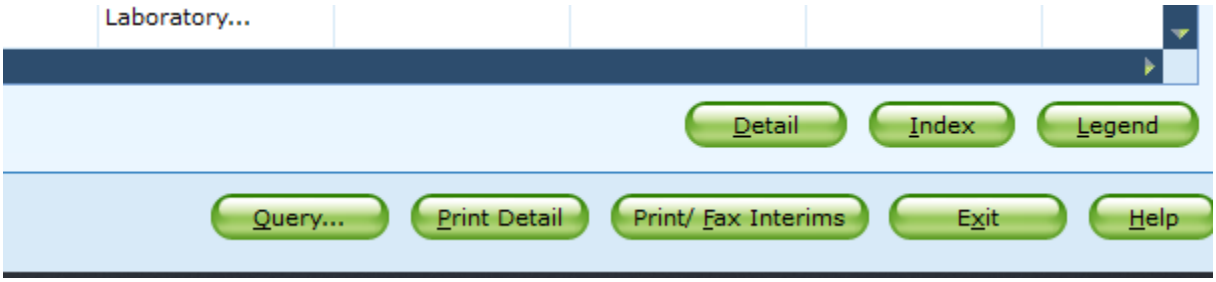
Grid (useful for overview and trends)



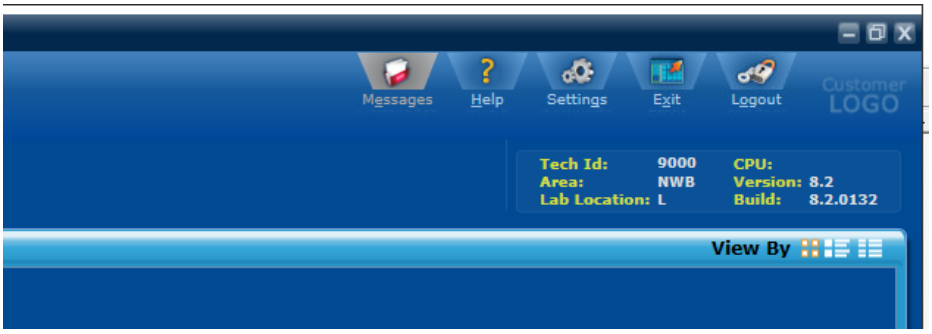
Graph (useful for individual tests)



12. When you are finished you can click Query to perform another search on a different patient or Exit Inquiry.



13. When you are finished you **Exit**



Further details are available in the training video link supplied.

Link to video for SUH is below, this will download the video in the download button on your browser.
https://saolta-knowledge.hci.care/Drs/DocumentDownload/58651

Faxed reports

Results can be faxed only when the following criteria have been met and are the responsibility of the individual laboratory departments involved.

A request to fax a result must be requested on headed paper, clearly indicating a contact person, location, address and fax no.

The fax no will be verified independently by the laboratory, a faxed request is issued by the laboratory to confirm identity of fax no location, only upon receipt of a response fax is the fax number validated.

No results will be faxed without this security procedure. This is to ensure patient confidentiality.

Please note this is a limited service and its abuse will result in its withdrawal.