

1	INTRODUCTION	5
1.1	Guide to using this manual	5
1.2	Location of the Pathology Department	6
1.3	Pathology Department Opening Hours	6
1.4	Cut-Off Times for Routine Sample Acceptance (Mon – Fri)	6
1.5	Designated Times for Obtaining Laboratory Results	6
1.6	Pathology Department Telephone Numbers	7
1.7	Referral Laboratories Contact Numbers	8
1.8	Pathology Department Fax Number	8
1.9	Naas General Hospital Website/Postal address	8
1.10	Phlebotomy	9
2	LABORATORY REQUEST FORMS, SAMPLE BOTTLES AND CONTAINERS	9
2.1	General Information	9
2.2	Procedure for Phlebotomy and Primary Sample Collection	10
2.3	Specimen Guide	12
2.4	Sample Volumes	13
2.5	24 Hour Urine Collection	14
2.6	Request Forms	15
2.7	Acceptance Criteria – General Information	15
2.8	Sample Acceptance Criteria - (for Internal Requests)	16
2.8.1	Request Form Details – Internal Requests	16
2.8.2	Labelling the Sample Container – Internal Requests	17
2.8.3	Unsuitable Samples and Request forms – Internal Requests	17
2.9	Sample Acceptance Criteria - (for External Requests)	17
2.9.1	Request Form Details - External Requests	17
2.9.2	Labelling the Sample Container - External Requests	18
2.9.3	Unsuitable Samples and Request forms - External Requests	18
3	DELIVERY, PACKING, TRANSPORT AND POSTAL REQUIREMENTS OF	19
	PATHOLOGY SAMPLES	19
3.1	Health and Safety	19
3.2	Sample Delivery within the Hospital during Routine Hours	19
3.3	Sample Delivery within the Hospital outside Routine Hours	19
3.4	Sample Delivery from outside the Hospital	20
3.5	Packing Procedure for the Transport of Diagnostic Samples (Non Infectious)	20
3.6	Transport of Infectious or Suspected Infectious Sample	20
3.7	Disposal of Waste Material Used in Sample Collection	20
3.8	Pneumatic Tube System (PTS)	20
3.9	System Operation of PTS	21
3.10	Laboratory Test/ Profile Description	21
3.11	Urgent Blood Sample Processing (excluding Blood Transfusion and Microbiological Requests)	22
3.12	Repeat Examination due to Analytical Failure	23
3.13	Further Examination of the Primary Specimen	23
3.14	Tests Not Listed	23
3.15	Laboratory Involvement in Major Emergency Plan	23
3.16	Clinical Consultation	23
3.17	Feedback and Complaints	23
3.18	Impartiality	23
3.19	Confidentiality	24
4	REPORTING OF TEST RESULTS	24
4.1	Accessing Laboratory Results on the LIS	24
4.2	Phoning/Communication of Results	24
5	EXTERNAL THIRD PARTY ASSESSMENT PROGRAMME	25
6	BLOOD TRANSFUSION	26
6.1	Introduction	26

6.2 Urgent Requests.....	26
6.3 Transfusion Options in an Emergency.....	26
6.4 Blood Products/Components for Transfusion.....	27
6.5 Blood Transfusion Laboratory Opening Hours	28
6.6 Emergency on-call	28
6.7 Repeat Samples.....	28
6.8 Sample Request Form.....	28
6.9 Sample Labelling Policy	29
6.10 Sending the samples to Laboratory.....	30
6.11 Telephone Requests Policy	30
6.12 Collection/Delivery of Blood and Blood Products	30
6.13 Return of unused Blood/Products to laboratory.....	31
6.14 Disposal of empty Blood/Product packs	31
6.15 Maximum Surgical Blood Ordering Schedule (M.S.B.O.S.).....	31
7 HAEMATOLOGY	33
7.1 Cut-off Times for Sample Processing and Referral (and availability On-Call).....	33
7.2 Special Protocols	33
7.3 Retrospective Requesting	33
7.4 Communication of Abnormal Results	34
7.5 Urgent Haematology Clinical Advice.....	35
7.6 Patients for Haematology Review	36
7.7 Haematology Reference Intervals / Ranges.....	36
7.8 Interferences	39
8 CLINICAL CHEMISTRY	40
8.1 Introduction.....	40
8.2 Retrospective requesting.....	40
8.3 Therapeutic Drug Monitoring.....	40
8.4 Protocol for Communicating Critical Results.....	40
8.5 Clinical Chemistry Investigations during On-Call Hours.....	42
8.6 Adult Reference Ranges	42
8.6.1 Estimated Glomerular Filtration Rate (eGFR)	49
8.7 Thyroid Function Tests – Procedure for Reflex Testing.....	52
9 NEAR PATIENT TESTING (NPT)	56
10 MICROBIOLOGY.....	58
10.1 List of tests available outside of routine hours	58
10.1.1 Emergency/On-Call Microbiology Service (8pm to 8am weekdays).....	58
10.1.2 Dedicated Micro Service (5pm to 8pm weekdays) also Sat, Sun and Bank Holidays (9am to 6pm).	58
10.2 Laboratory Notification of Emergency Work:.....	59
10.3 Transport of samples to the laboratory	59
10.4 Storage	59
10.5 Results reported by phone.....	59
10.6 Notifiable results.....	59
10.7 Susceptibility Testing	59
10.8 Special requirements for Microbiology Sampling and Testing	59
10.9 Sample Types.....	60
10.9.1 Blood Cultures.....	60
10.9.2 Cerebrospinal Fluid (C.S.F.)	61
10.9.3 Fluids from sites normally sterile.....	62
10.9.4 Sputum Culture/Bronchio-Alveolar Lavage/Bronchial Washings/ Antral Washout.....	62
10.9.5 Eye Swabs	64
10.9.6 Throat Swab	64
10.9.7 Nasal Swab.....	64
10.9.8 Genital Infections	64
10.9.9 Pus Samples/Wound Swabs/ Cannulae/Tissue+Biopsie specimens.....	65

10.9.10	Urine.....	66
10.9.11	Faeces	68
10.9.12	Antibiotic Assays	69
10.9.13	Screening Methods.....	70
10.9.14	Ova Cysts & Parasites	71
10.9.15	<i>Mycobacteria tuberculosis</i> (TB) staining & culture (ZN & AFB culture).....	71
10.9.16	Mycology (Fungal) Examination & Culture	72
10.9.17	Coronavirus (SARS CoV-2) (COVID19)/InfluenzaA+B/RSV	72
	(Respiratory Syncytial Virus) Testing.....	72
10.9.18	Virology/Serology Investigation	73
11	HISTOPATHOLOGY DEPARTMENT (TALLAGHT HOSPITAL).....	78
12	GUIDE TO PATHOLOGY TESTS: (Internal Requests and External Referrals)	79

1 INTRODUCTION

Naas General Hospital is a 243 bedded acute public hospital serving the catchment area of Kildare and West-Wicklow with a population of over a quarter of a million people. An important aspect of the hospital's role is the provision of a 24-hour Emergency Department. The hospital employs approximately 1,040 WTE staff and 130 agency staff.

This manual is designed to give an overall view of the services available in the Pathology Department. It is intended as a quick reference guide for all pathology users both within the hospital and those from outside agencies.

All Pathology services undergo continuous review through quality assurance and audit activities. The laboratory is committed to performing its activities in accordance with the requirements of the International Standard ISO 15189:2012.

The laboratory is accredited as a medical testing laboratory to ISO 15189:2012, Registration number: 259MT. For the scope of accredited tests, please refer to the Irish National Accreditation Board website at www.inab.ie.

The information in this manual is correct as of effective date. Due to the nature of medical science testing, requirements may change. These changes may be communicated to users e.g. via memos. If clarity is required please check with the Laboratory.

Appropriate test ordering makes best use of limited pathology resources and ensures targeted laboratory analysis. Please supply clinical details with all tests requiring referral to external locations. Requests may not be referred if clinical details are not supplied.

The Laboratory (Pathology department) is committed to promoting and providing the highest quality diagnostic and consultative services for its patients and users.

Laboratory management are committed to:

- Staff recruitment, induction and maintenance of competent, well trained staff through internal and external education, training and development opportunities.
- The proper procurement and maintenance of equipment, external services and supplies and other resources as are needed for the provision of the service.
- The collection, transport and handling of all samples in such a way as to ensure the correct performance of laboratory examinations.
- The use of examination procedures and methods that will ensure the highest achievable quality of all tests performed.
- Reporting results of examinations in ways which are timely, confidential, accurate and clinically useful.
- The assessment of user satisfaction, in addition to internal audit and external quality assessment, in order to produce continual quality improvement.

1.1 Guide to using this manual

This Manual is stored as an electronic copy on the NGH Q Pulse system and on the Naas Hospital website: [www.naashospital.ie/Departments/Pathology Laboratory](http://www.naashospital.ie/Departments/Pathology%20Laboratory). The document is stored in Adobe Acrobat format, which allows all computer users to read the document while preventing modification. **Users can use the Cntrl F function to search for a word or test within the document**

1.2 Location of the Pathology Department

The Pathology Department is located on Level 3 in the main hospital building.

1.3 Pathology Department Opening Hours

Department/Activity	Opening Hours
Specimen Reception	Monday to Friday 08.30 – 17:00
Routine Laboratory Diagnostic Service	Monday to Friday 09:30 – 17:00
Emergency Out of Hours Service (On-Call Diagnostic Service)	Monday to Friday 17:00 – 09:30 Saturday and Sunday (24 Hours) Bank Holidays (24 Hours)
Please limit requests during out-of hours service to tests processed at Naas General Hospital.	

1.4 Cut-Off Times for Routine Sample Acceptance (Mon – Fri)

Source of Samples	Cut-Off Times
GP and External Hospital Blood Samples	16:00 Mon-Thurs , 13:00 Friday
OPD Samples	17:30
GP and External Hospital Samples for Microbiology	16.00
Blood Transfusion Samples (Internal or External Sources)	15:45
In-Patient Naas Hospital Samples excluding Blood Transfusion.	16:00
Antibiotic Assays (Microbiology).	14:00

1.5 Designated Times for Obtaining Laboratory Results

The laboratory may be contacted by phone for results during the hours of:

11.30 - 12.30 and 15.30 – 16.30 Monday to Friday. Please phone 045 843033 and select Option 1 for results from the voice-mail service assigned to this number. Please note these extensions are not manned outside these hours.

Results, once authorised, are available on the Laboratory Information System.

Results, once authorised, are electronically reported to Healthlink users.

NB: Urgent queries after 5.00pm and at weekends should be directed through hospital switch (045 849501).

1.6 Pathology Department Telephone Numbers

Department/Position	Phone Number <i>Insert (045) 84 before extension number for direct access if phoning from outside the hospital.</i>	Bleep Number
Specimen Reception	3033 (Option 2) /9911	N/A
Laboratory Clerical Office	3033 (Option 1) /3037	N/A
Laboratory Director	Contact via Laboratory Manager	N/A
Laboratory Manager	3046	N/A
Microbiology	3033 (Option 5)	N/A
Clinical Chemistry	3033 (Option 4)	N/A
Haematology	3033 (Option 6)	N/A
Coagulation	3033 (Option 6) /3041	N/A
Blood Transfusion	3033 (Option 3)/3040	N/A
Consultants: Consultant Haematologist Consultant Chemical Pathologist Consultant Microbiologist	Routine hours: Contact the relevant department for consultant contact details. Out of routine hours: Contact the relevant emergency on-call medical scientist via switch (045 849501) for consultant contact details.	N/A
Emergency On-Call Medical Scientist: Clinical Chemistry	Contact Switch 9501	N/A
Emergency On-Call Medical Scientist: Microbiology	Contact Switch 9501	N/A
Emergency On-Call Medical Scientist: Haematology/Blood Transfusion	Contact Switch 9501	N/A
Quality Manager	3051	N/A
IT Specialist Scientist	3051	N/A
Surveillance Scientist	3128	N/A
POCT Manager	9944	302
Haemovigilance Officer	3013	217
Other areas:		
Phlebotomy	9883	142/212
OPD Manager		204
Infection Control	9935	225

1.7 Referral Laboratories Contact Numbers

Location	Telephone	Website Address
Tallaght Hospital Biochemistry.	(01) 4143951/52	www.tuh.ie
Tallaght Hospital Coagulation.	(01) 4143963	www.tuh.ie
Tallaght Hospital Endocrinology.	(01) 4143955	www.tuh.ie
Tallaght Hospital Haematology.	(01) 4143961	www.tuh.ie
Tallaght Hospital Microbiology Laboratory.	(01) 4143940/41/42	www.tuh.ie
Beaumont Hospital	(01) 8092675	www.beaumont.ie
Beaumont Hospital HPLC/Cathecholamines.	(01) 8092351	www.beaumont.ie
Eurofins Biomnis Laboratories.	(01) 2958545	www.eurofinsbiomnis.ie
Irish Blood Transfusion Service (IBTS).	(01) 4322800	www.giveblood.ie
Irish Meningitis and Sepsis Reference Lab (IMSRL).	(01) 8784432	www.cuh.ie
National Centre for Medical Genetics, Crumlin.	(01) 4096840	www.olchc.ie
National Coagulation Laboratory, Centre for Clinical Pathology and Laboratory Medicine, St. James's Hospital, Dublin 8.	(01) 4162956	www.stjames.ie
Pneumococcal Typing Project, Dept. Clinical Microbiology, Beaumont Hospital.	(01) 8093708/3710	www.beaumont.ie
St. James's Hospital (SJH), Haematology.	(01) 4162048	www.stjames.ie
St. James's Hospital (SJH), Immunology.	(01) 4162925	www.stjames.ie
National Virus Reference Laboratory (NVRL). UCD Campus	(01) 7164401	www.nvrl.ucd.ie
Immunology Department, Oxford University Hospital.	0044 (0) 1865225995	www.ouh.nhs.uk/immunology

1.8 Pathology Department Fax Number

045-843096

1.9 Naas General Hospital Website/Postal address

Website: www.naashospital.ie

Postal Address:

Pathology Department,
Naas General Hospital,
Craddockstown Road,
Naas,
Co. Kildare
W91 AE76

1.10 Phlebotomy

A Phlebotomy service operates on the hospital wards. Phlebotomy is also available in the Outpatients Department for patients attending the Outpatients Clinic with **pre-arranged appointments**. It is not a walk-in clinic, patients without an appointment will not be accommodated.

2 LABORATORY REQUEST FORMS, SAMPLE BOTTLES AND CONTAINERS

2.1 General Information

This section deals with the information that is required to be documented on the laboratory **request form** and the **sample bottle** or container, prior to the analysis of samples.

The Laboratory has a number of different request forms. It is important that the correct form is supplied for a particular test.

Blood Transfusion: Please refer to Blood Transfusion **Section 6** for additional requirements for sample and form labelling.

Histology: Please refer to Histology Section (Tallaght) **Section 11** for Tallaght requirements for sample and form labelling.

See section 2.6 below for full description of available request forms.

2.1.1 SPECIMEN RECEPTION

The specimen reception area in the lab provides the following functions:

- Reception, collation and registration of specimens.
- Dispatch of samples and requests to other referral laboratories
- Supply of blood culture bottles, pregnancy testing kits (currently supplied for Day Ward use only) quantiferon testing kits, 24hr urine containers (for external testing locations) and acid for 24 hour urine containers as required for certain investigations as well as the supply of specialised sample bottles as per requirements stated in Section 12.

2.1.2 STORES DEPARTMENT

The Stores Department supplies items including, but not limited to: 24 hour urine containers (for wards), blood sample tubes, some swabs e.g. Viral transport swabs (for GP surgeries and wards), request forms (for GP surgeries and wards). A GP requisition form can be used to place e-mail orders for stock. Please contact the stores department at 045 849559 or 045 849940 to arrange.

Some microbiological sample types e.g. APTIMA/Oracol swabs can be ordered directly from the National Virus Reference Laboratory (NVRL) website – refer to www.nvrl.ucd.ie and select swab orders from the main menu.

2.2 Procedure for Phlebotomy and Primary Sample Collection

(Adapted for use from the National Clinical Policy & Procedural Guideline, Revision 6).






- 2.2.1** Prepare the following equipment: - In a clean procedure tray with a Sharps container
- Venepuncture Needle – Sarstedt system
 - Blood specimen bottles – Sarstedt system. Check the expiry date on the sample tubes. **DO NOT USE SAMPLE TUBES THAT ARE PAST THEIR EXPIRY DATE**
 - Personal protective equipment (e.g. 2 pairs of well-fitting non-sterile gloves)
 - Skin disinfectant (70% impregnated alcohol wipes)
 - Alcohol hand rub/gel
 - Clean Tourniquet
 - Topical anaesthetic agent if prescribed
 - Blood request forms/biohazard bag for transport of specimens
 - Sterile gauze
 - Sterile plaster/band aid
- 2.2.2** Carry out hand hygiene using an antiseptic soap or gel if hands are visibly clean for a minimum of 15 seconds.
- 2.2.3** Determine what blood bottles are required for the selected investigations by reference to Section 12 of this document.
- 2.2.4** **Locate the patient and check name, hospital number and DOB against patient identity band, blood form and bottle label.**
- 2.2.5** Explain the procedure to the patient, check for allergies, discuss pain relief and obtain informed consent.
- 2.2.6** Ensure the patient is in a comfortable position - have them lie flat on a trolley, bed or seated in a suitable safe chair. Observe the patient throughout the procedure for signs of paraesthesia, fainting or dizziness.
- 2.2.7** Apply a tourniquet (5-6 centimetres above the chosen site) and tighten slowly. Do not leave on for longer than one minute.
- 2.2.8** Ask the patient to open/close fist and keep fist closed or place arm below heart level to encourage venous filling.
- 2.2.9** Palpate the site to check for rebound elasticity – press lightly with two fingers and release. Choose the appropriate vein.
- 2.2.10** Decontaminate hands using alcohol hand rub/gel, allow to dry. Apply gloves (face protection if required).
- 2.2.11** Disinfect the site using skin disinfectant (70% impregnated alcohol wipes) in a circular motion from insertion site outwards (5-10 cms diameter).
- 2.2.12** Place the used alcohol wipes in the procedure tray ensuring not to contaminate the sterile wipes. Allow to air dry, do not repalpate the site.





- 2.2.13** Open and assemble the appropriate blood collection set. Attach the venepuncture needle to a blood bottle (for Blood Culture bottles, sterilise lid first for a minimum of 15 seconds and allow to dry). The first bottle should not be pre-vacuumed as the pressure exerted on the vein by the vacuum may cause the vein to collapse.
- 2.2.14** Using your non-dominant hand to achieve skin traction. Hold the blood collection set between your thumb and index finger.
- 2.2.15** Position the needle - facing bevel upwards. Insert the needle directly above the vein, through the skin (angle 10-30°). Care should be taken not to enter too fast and too deep otherwise the needle can go through the back of the vein.
- 2.2.16** When using the Sarstedt system, pull the plunger back slowly until the blood bottle is filled. When multiple blood tests are required, ensure the blood tests are taken in the proper order of draw (refer to Section 2.3.1 of this manual). Subsequent bottles can be pre-vacuumed. This is achieved by pulling the plunger back until it clicks. This is not advisable in patients with difficult or small veins.
- 2.2.17** If no sample can be obtained, remove the blood bottle, remove the tourniquet, withdraw the needle and locate to another site. If no success after two attempts, seek further help from a more experienced person.
- 2.2.18** IF BLOOD CULTURES ARE REQUESTED, THESE SHOULD BE FILLED FIRST. PLEASE USE THE FOLLOWING ASEPTIC TECHNIQUE. Do not use existing peripheral lines/cannula or sites immediately above peripheral lines. Identify a suitable venepuncture site before disinfecting the skin. Avoid femoral vein puncture because of the difficulty in adequate skin cleansing and disinfection. This will prevent the presence of normal skin flora being detected in the sample, which can give misleading interpretation of results and possible unnecessary antibiotic therapy.
- 2.2.19** Loosen and release the tourniquet. Invert the bottles gently four to five times to mix appropriately. Do not shake the bottles.
- 2.2.20** Apply sterile cotton wool over the puncture site and remove the needle.
- 2.2.21** Place the blood collection set into the sharps box.
- 2.2.22** Maintain digital pressure on the puncture site to prevent blood leakage. Arm can be elevated while applying pressure to prevent haematoma formation but do not bend the arm.
- 2.2.23** Discard the blood contaminated gauze in the procedure tray. Apply sterile dressing or plaster over the puncture site.
- 2.2.24** Remove gloves and place in the procedure tray Carry out effective hand hygiene for a minimum of 15 seconds (alcohol hand rub/gel).
- 2.2.25** Inform the patient of potential complications and advise to report same. Ensure the patient is in a comfortable position and reassure. Apply alcohol hand rub/gel, allow to dry.
- 2.2.26** Apply gloves and ensure blood collection bottles and request forms are correctly labelled. Place all blood collection bottles and forms into biohazard bags and send to the laboratory, with request form placed separately in the sleeve provided. **DO NOT PLACE SAMPLE AND FORM TOGETHER IN THE SAME POUCH OF BIOHAZARD BAG.**
- 2.2.27** Always supply clinical information including known infection risk with each request. Clinical details are essential for referred tests. Some tests may not be referred in the absence of appropriate clinical details.

2.3 Specimen Guide

2.3.1 Blood Specimens

NOTE: Blood Cultures must be drawn first (Collect 20mls of blood with a needle and syringe. Change the needle and **aseptically** inoculate the ANAEROBIC (Purple) bottle first with 10 mls of blood, change needle again and inoculate the AEROBIC (Blue) bottle with remaining blood).

Order Of Draw	Colour Top	Spec. Vol.	Tube Content	Example Assays	Mixing Instructions	Special Instruction
Draw must be first	PURPLE (Anaerobic)*  BLUE (Aerobic) 	10 mls 10 mls		Blood cultures taken first to avoid contamination *If using needle and syringe take anaerobic bottle first if using winged blood collection set take aerobic bottle first	Rotate gently to mix.	Remove the plastic flip top and sterilise lid using a Mediswab for min 15secs. Please do not cover removable barcode label with the addressograph label.
Order of Draw (According to CLSI[∞]) minimises carry-over of anticoagulant						
1	GREEN 	3 mls	Trisodium Citrate	All Coag tests	After blood collection invert tube 4 times	Fill to line on tube, under or overfilled tubes cannot be processed
2	LIGHT BROWN SERUM (GEL) 	4.9 mls	None	Vit B12, Folate, Ferritin, Lithium, LDH		
3	ORANGE (GEL) 	2.7mls	Li Heparin	General Clinical Chemistry	After blood Collection, invert tube 5-10 times.	

Order Of Draw	Colour Top	Spec. Vol.	Tube Content	Example Assays	Mixing Instructions	Special Instruction
4.	Radiometer safePICO Arterial/Venous 	1.0 ml	Electrolyte Balanced Heparin	Blood Gas & Metabolites Pleural/ Ascitic Fluid - pH	After collection Remove all air bubbles Use automatic mixer on ABL 90 Flex prior to analysis N/A	Analyse immediately or within 15 mins Hand delivery for Laboratory analysis DO NOT send sample in PTS (Chute) system. Analyse immediately or within 15 mins Send to Laboratory for analysis
5	RED 	2.7mls	EDTA-KE	FBC, ESR, HbA1C	After blood Collection, invert tube 8-10 times.	
6	RED 	7.5mls	EDTA-KE	Group and Hold, Group and Crossmatch, Direct Coombs Test	After blood Collection, invert tube 8-10 times.	Safetrack labels mandatory for inpatients. Form must be signed. Addressographs accepted for DCT requests and on external samples.
7	YELLOW 	2.7mls	Fluoride/ EDTA	Glucose levels	After blood Collection, invert tube 5-10 times	

∞ CLSI Procedure for the collection of diagnostic blood specimens by venepuncture, approved standard: *GP41* 7th edition (2017).

2.3.2 Microbiology Specimens

For a list of microbiological specimen types, specimens required and conditions for taking samples please see section 10.8 ‘Special requirements for Microbiology Sampling and Testing’ below.

2.4 Sample Volumes

It is preferable that blood tubes, especially those containing preservatives, are filled to their stated capacity. This avoids the risk of insufficiency or interferences from excess concentrations of preservative.

This is mandatory for some tests, e.g. coagulation tests where underfilling or overfilling invalidates the test.

It is usually possible to process other smaller samples where the tube is at least half filled. We will always try to maximise the use of any sample.

Please keep number of spare samples to a minimum. Refer to Section 12 ‘Guide to Pathology Tests’ for sample requirements. **Please send separate samples for samples referred to different testing locations.**

2.5 24 Hour Urine Collection

a) Instructions for Collection of Container:

- Please obtain a bottle for this collection from the Pathology Department. If a preservative is required this is added by Laboratory staff.

b) Instructions for Collection of 24 hour urine:

Please Note: It is very important that you collect all the urine that you pass during an EXACT 24-hour period. Do **NOT** void urine directly into the 24-hour container. Void urine into the beaker/receptacle provided and transfer the urine into the 24-hour container.

- Please ensure your Full Name, Date of Birth, Gender, Consultant and Hospital Number (if known) are provided **on** the urine container label.
- Empty your bladder at 8 am (or at a more convenient time,) into the toilet. This is now the start time of the collection. Write the start date and time on the container label.
- Collect all your urine in the container provided on **EVERY** occasion that it is passed during the next 24 hrs (including overnight) and store refrigerated if possible. Loss of any urine, or a collection made for either more or less than 24 hours, will invalidate the test and might lead to an incorrect diagnosis.
- Empty your bladder at 8 am on rising the next morning (or at the more convenient time chosen) and **ADD** this to the collection. This is the finish time of the collection. Write finish date and time on the container label. Discard the beaker/receptacle used to transfer urine to the 24-hr container.
- Please ensure that all your details on the container and the request form are fully completed and that the cap is closed securely. Bring the collection to the hospital laboratory between the following hours, 8 am – 6 pm Mon-Fri or 9am – 1 pm Sat.

Note: It is not advisable for female patients to do 24 hr urine collections during menstruation.

Some analyses require the addition of acid.

Caution: Care should be taken when handling the container containing acid. You will be given safety information and instructions for making a 24- Hour Urine collection into a container with Hydrochloric acid as preservative and asked to sign a form declaring you have read and understood the instructions.

➤ **Incomplete collections:**

If you forget and lose a sample down the toilet, please return the partial collection to the laboratory for safe disposal and ask for a new container from the laboratory. A copy of this information is provided on each 24 hour container.

2.6 Request Forms

Tests	Request Form
1. Blood Transfusion Tests.	Pink and White - (NGH/BB/FM/001)
2. Clinical Chemistry and Haematology Tests. These forms are for tests processed in NGH Lab Only (Refer to page 79 for listed tests)	Blue and White - (NGH/BIO/FM/001) – <i>Internal Users</i> Light Grey and White (NGH/BIO/FM/004)- <i>External Users</i>
3. Diabetes OPD.	Green (NGH/BIO/FM/005)
4. General Microbiology.	Yellow and White (NGH/MIC/FM/001)
5. Referral Test Request Form	Purple and White (NGH/PATH/FM/001)
6. Request form for Additional Test (In-house) on Sample Previously sent to Clinical Chemistry	Light Green and White (NGH/BIO/FM007)
7. Request form for Additional Test (In-house) on Sample Previously sent to Haematology/Coagulation)	Light Pink and White (NGH/HAEM/FM/012)

2.7 Acceptance Criteria – General Information

The following information must be documented in a **LEGIBLE** manner **on all 4 sheets** of the request form ensuring that if addressograph labels are used, they are attached to **all 4 sheets** of the request form. This is essential as requests for referred tests require referral to numerous different testing locations, each location requiring a request form to accompany the sample.

Addressograph labels may be used on all samples and forms **except** Blood Transfusion samples. **See Section 6.8 below for Blood Transfusion requirements.**

If hand writing details please write clearly and ensure all minimum criteria are included. Section 2.8 outlines the acceptance criteria for NGH patients and Section 2.9 for external locations.

NGH Requests: Safe Track labels are acceptable on request forms and samples, provided that all relevant information and signatures/ requesting doctor is stated.

Clinical Details: Relevant Clinical Details are required to ensure analysis of requested tests. Tests may not be referred if clinical details are not supplied.

Request forms received with **illegible details**, for example, addressograph labels with demographics cut off, **will not be processed.**

Gender: Patient's gender is a mandatory requirement so that the correct reference range is applied to the resulting laboratory report. Please note the reference range stated on the report pertains to the DOB and gender stated on the request. Please refer to section 7.7 and 8.6 for reference ranges for alternative ages/ gender. This may be particularly relevant for patients undergoing gender reassignment therapy.

2.8 Sample Acceptance Criteria - (for Internal Requests).

2.8.1 Request Form Details – Internal Requests

Items marked with an * are mandatory and samples will not be processed without this information supplied on the request form.

1. *Patient's **Hospital Number**.
2. *Patient's **Full Name** (Surname and Forename. Initials are not acceptable).
3. *Patient's **Date of Birth**.
4. *Patient's **Gender**. (*Enables correct reference range to be applied to result*).
5. Patient's **Full Current Address**.
6. *Patient's **Location** (Hospital Ward).
7. *The name of the **requesting Clinician/Consultant**.
8. **Sample type** and **anatomical site** where appropriate.
9. ***Test(s)** required.
10. **Date** and **time** of sample collection.
11. Relevant **clinical information** appropriate to the test(s) requested must be supplied (for example, relevant clinical details, antibiotic therapies, anticoagulation or other therapies).
12. A clear indication if the tests requested are **urgent**.
13. The **name** and **contact details** of the person **taking** the bloods.
14. Any samples from **known infectious patients** e.g. HIV, hepatitis, TB, Sars Cov-19 should have a red sticker attached to both sample and form.

2.8.2 Labelling the Sample Container – Internal Requests

Items marked with an * **are mandatory** and samples will not be processed without this information. The following information must be documented in a legible manner on the sample container:

1. ***Patient’s Full Name.** (Surname and Full Forename. Initials are not acceptable).
2. ***Hospital number** and / or **Date of Birth.**
3. The **initials** of the person **collecting** the sample.

Please ensure the ward location on addressograph labels is current and correct.

2.8.3 Unsuitable Samples and Request forms – Internal Requests

Sample / Form Issues	Action	Documentation
Samples unlabelled	Samples will not be processed.	Demographic details (from request form) will be entered on the LIS system. The request will be logged as an Unsuitable Specimen on the LIS.
Patient demographics on sample and request form differ.	Samples will not be processed.	Demographic details (from request form) will be entered on the LIS system. The request will be logged as an Unsuitable Specimen on the LIS. Ensure both names are recorded on the request form for traceability.
Miscellaneous sample/form issues	Samples will not be processed.	The request will be logged as an Unsuitable Specimen on the LIS.
Minimum identifier(s) missing from samples or request form	Samples will not be processed.	The request will be logged as an Unsuitable Specimen on the LIS.

2.9 Sample Acceptance Criteria - (for External Requests).

2.9.1 Request Form Details - External Requests.

Items marked with an * are mandatory and samples will not be processed without this information supplied on the request form.

1. ***Patient’s Full Name** (Surname and Forename – Initials are not acceptable)
2. ***Patient’s Date of Birth and/or Hospital Number**

3. Patient's **Full Home Address** (This is important for positive patient identification).
4. *Patient's **Gender**. (*Enables correct reference range to be applied to result*)
5. ***Name of GP** requesting tests.
6. ***Location of requesting GP** i.e. GP surgery name and address
7. **Sample type** and **anatomical site** where appropriate.
8. ***Test(s)** required
9. **Date** and **time** of sample collection.
10. Relevant **clinical information** appropriate to the test(s) requested must be supplied (for example, relevant clinical details, antibiotic therapies, anticoagulation or other therapies).
11. A clear indication if the tests requested are **urgent**.
12. The **name** and **contact details** of the person **taking** the bloods.
13. Any samples from **known infectious patients** e.g. HIV, Hepatitis, TB, Sars Cov-19 should have a red sticker attached to both sample and form.

2.9.2 Labelling the Sample Container - External Requests

Items marked with an *** are mandatory and samples will not be processed** without this information. The following information must be documented in a **LEGIBLE** manner on the sample container:

1. ***Patient's Full Name**.
2. ***Date of Birth**.
3. Date and time of sample collection

2.9.3 Unsuitable Samples and Request forms - External Requests.

These will be logged as per 2.8.3 above and as described in NGH/SR/SOP/003- "Procedure for Unsuitable Specimens". If samples are not accepted, a comment stating reason will be included on the report.

The following unsuitable samples will be phoned

1. Requests marked Urgent
2. Troponin T requests
3. SARS- Cov-2/Covid-19 requests.

3 DELIVERY, PACKING, TRANSPORT AND POSTAL REQUIREMENTS OF PATHOLOGY SAMPLES

3.1 Health and Safety

It is the policy of the Pathology Department to treat all samples as potentially infectious or high risk. Therefore, it is advisable to take universal precautions in the collection, packaging and the delivery of samples being sent to the Pathology Department for analysis. It is the responsibility of the requesting clinician to ensure that samples which pose an infection risk to staff (e.g. HIV, hepatitis, TB, SARS- COV-2) are clearly identified by a RED STICKER attached to the request form and sample. Transmissible spongiform encephalopathy agents (CJD) – samples should be marked with a “Bio-Hazard” label. If any other infectious disease is suspected, this should be included on form with all relevant clinical details.

Sample containers, request forms or plastic transport bags which are contaminated will not be accepted for processing by the laboratory.

3.2 Sample Delivery within the Hospital during Routine Hours

During routine phlebotomy times the Phlebotomy team will collect blood samples. These samples are usually delivered by the ward attendants or sent via the Pneumatic Tube System (PTS). Certain samples should never be sent in tube system, refer to Section 3.9 below. All other sample types may be collected and delivered by non-phlebotomy staff. All samples being sent to the laboratory should be placed in a plastic sample bag. Please mark any urgent **blood** samples “**URGENT**” and every effort will be made to prioritise these requests.

Refer to section 3.11 for further information on processing of urgent requests.

3.3 Sample Delivery within the Hospital outside Routine Hours

Outside of routine phlebotomy times blood samples will be taken by either medical doctors or nurses on the ward. These samples are usually delivered by the ward attendants or sent via the Pneumatic Tube System.

Certain samples should never be sent in tube system, refer to Section 3.9 below.

Urgent samples outside of routine hours should be sent to the Pathology Department via the Pneumatic Tube System (See Section 3.8/3.9) or dropped off at Specimen reception. **The relevant Medical Scientist On-Call should be phoned immediately prior to sending samples with the caller specifying the patient name.**

There are three on-call medical scientists on duty, one covering Clinical Chemistry, one covering Microbiology and the third covering Haematology/Coagulation/Blood Transfusion. **The on-call medical scientists are contactable via switch. Please specify which scientist is required when contacting the switchboard.** The form should be marked as **Urgent**.

Non-urgent samples should be delivered to the laboratory via Pneumatic Tube System or dropped off at Specimen Reception.

Please do not assume that samples sent to the laboratory out of hours will be processed. Processing of samples is only guaranteed when the on-call scientists has been contacted with the caller specifying the patient name to the scientist.

3.4 Sample Delivery from outside the Hospital

The requirements stated below apply to all samples directed to the Pathology Department. These will be required to be packed and transported in accordance with the European Agreement concerning the International Carriage of Dangerous Goods by Road (UNADR).

3.5 Packing Procedure for the Transport of Diagnostic Samples (Non Infectious)

1. Samples to be sent should be stored in a secure (preferably plastic) primary container.
2. Wrap the container in tissue or cotton wool which will act as absorbent material in event of any spillages and place in a biohazard bag.
3. Place the biohazard bag with the sample in a padded (jiffy bag) envelope.
4. Label the envelope with a hazard-warning label, "Diagnostic Sample".
5. Place the name, address and contact number of the destination laboratory on the outside of the envelope.
6. Place the name, address and contact number of the originator on the outside of the envelope.
7. The sample can be transported or posted as appropriate.

3.6 Transport of Infectious or Suspected Infectious Sample

Samples suspected or known to contain risk group 3 or 4 pathogens are classified as infectious and are packaged and transported accordingly as outlined below:

1. Samples to be sent should be stored in a secure (preferably plastic) primary container.
2. Wrap the container in tissue or cotton wool that will act as an absorbent material in event of any spillages.
3. Place the wrapped primary sample inside a plastic container of the UN-approved Class 6.2 package type.
4. Place the container inside the cardboard box.
5. The box should contain a label "Infectious Substance". Write the name of the suspected microbe being transported in brackets.
6. Place the name, address and contact number of the destination laboratory on the outside of the box.
7. Place the name, address and contact number of the originator on the outside of the box.
8. Complete a transport document and provide a copy to the licensed courier.
A licensed courier must be used for the transport of infectious or suspected infectious samples.

3.7 Disposal of Waste Material Used in Sample Collection

All materials used in sample collection should be treated as potentially hazardous and discarded using sharps containers and other appropriate colour coded bins/bags. Please refer to PPPG-240 "Infection Control Guidelines on the Management of Healthcare Waste" and PPPG- 359 "Guidelines on the Removal, Collection and Storage of Waste generated by NGH".

3.8 Pneumatic Tube System (PTS)

Brief operating instructions are located on cards at each ward PTS station.

Yellow pods are for pharmacy only and should not be used for laboratory samples.

Red pods are for laboratory samples only and should not be used for drugs.

Pods should **not** be used for non-pharmacy or non-laboratory items.

3.9 System Operation of PTS

1. Place the sample correctly in the appropriate pod and close the top firmly.
2. Enter the destination station code and the destination area will be displayed.
3. Immediately place the pod containing the sample into the sending funnel. A green light indicates initiation of transport. The pod will automatically transfer when the system is ready.
4. The pod should not be overfilled with samples as this can make it hard to remove samples without tearing forms and if pod is too heavy it may not be transported through system correctly.
5. Do not use pod's which have damaged seals around top of pod.
6. All laboratory samples should be directed to Sample Reception at **3033**.
7. The receiver should empty the pod and immediately return to sender station.
Please redirect misaddressed pods to the correct location.
8. Please report any issues with the PTS immediately by phoning the number on the display of the chute in your area. This is a 24 hr support service.

The following sample types MUST NOT BE SENT via the PTS:

- CSF
- Arterial(ABG) /Venous Blood Gas
- Bone Marrow Samples
- Histology samples

3.10 Laboratory Test/ Profile Description

Each laboratory test will be described under the following headings – refer to Section 12:-

- **Test/Profile** – name of test or test profile.
- **Testing Location** – For tests performed internally, the relevant NGH department is stated and for tests referred, the external referral location is stated. The Laboratory is unable to deviate from the referral site stated. Alternative referral sites will be considered in exceptional circumstances only.
- **Specimen type/requirements** – e.g. type of specimen, type of blood tube, minimum volume required
- **Tube cap colour or container type** – e.g. serum or EDTA or universal container.
- **Special requirements** – e.g.
 - Patient preparation, e.g. fasting.
 - Consent form, e.g. Haemochromatosis, Fragile X, Karyotyping.
 - Special timing for collection of samples e.g. pre and post drug administration.
 - Any special handling needs between time of collection and time received by the laboratory (transport requirements, refrigeration, warming, immediate delivery etc.)
 - If authorisation is required by the relevant Consultant

- **Turnaround time (TAT)**

Turnaround time is defined as the time from specimen receipt in the Pathology department to the time results are authorised. In section 12 of this document, turnaround time is defined as hours or working days. Working days denotes Monday to Friday and does not include out of hour periods including weekends and bank holidays.

Tests with turnaround times given as one working day usually have results available within the same day.

Stated turnaround times are for routine sample processing. Urgent samples are prioritised and have a shorter turn-around time than stated for routine analysis. Refer to section 3.11 Urgent Blood Sample processing (excluding Blood Transfusion and Microbiological requests)

Turnaround times are routinely monitored as part of the laboratories quality improvement program. Requesters will be notified of delays in turnaround times which could compromise patient care.

Blood Transfusion: Refer to section 6 below for information on processing urgent requests and turnaround times for blood components.

Microbiology: Refer to section 10 below for further information and availability of tests out of hours.

3.11 Urgent Blood Sample Processing (excluding Blood Transfusion and Microbiological Requests).

Where possible the pathology laboratory aim to report all Urgent blood results as soon as possible with a maximum turnaround time of 2 hrs.

Routine Hours Urgent Blood Sample Processing

All blood samples marked “Urgent” or phoned in advance as being urgent and all samples from the following locations – ED, MAU, CCU, ICU, ODW (Oncology Day Ward) and HDW (Haematology Day Ward) are prioritised for processing within the laboratory as outlined in Section 5.3.2 of NGH/SR/SOP/001 “Procedure for receipt, acceptance and labelling of specimens (excluding external referrals) in Specimen Reception”.

Overuse of the urgent service will adversely affect the turnaround times for all urgent tests.

If GP samples are urgent please indicate this on the request form and provide a phone number for phoning of results after normal surgery hours. This will be used only if results fall within departmental specified critical limits for phoning as outlined in sections 7.4 and 8.4.

Out of Hours Urgent Blood Sample Processing

During the out of hours service direct communication with the on-call medical scientist is required for urgent sample processing. The on-call medical scientist can be contacted via hospital switchboard.

Urgent turnaround times will not be guaranteed if samples are labelled as “Urgent” or from an urgent area e.g. ED without direct communication with a medical scientist during out of hours periods. Certain investigations may require laboratory consultant approval for processing out of hours.

3.12 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 back-up instrument.

Or

- Store the specimens in appropriate conditions until the cause of the analytical failure is identified and corrected and then repeat the test. The urgency of the outstanding specimens is reviewed by the relevant laboratory Consultant or nominee.

3.13 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, it is the policy of the Pathology department to pursue a diagnosis by performance of additional tests, if available, using the primary specimen.

3.14 Tests Not Listed

If you require a diagnostic test that is not listed, please contact the Pathology department who will endeavour to **outsource** your test requirement, if possible. Please contact the lab ahead of the patient's appointment so that the laboratory have time to investigate location of referral lab and sample requirements.

3.15 Laboratory Involvement in Major Emergency Plan

In the event of a major disaster the switchboard in Naas General Hospital will inform the Haematology/Blood Transfusion department or the Medical Scientist On-Call. Internal major emergency plan procedures will be initiated.

3.16 Clinical Consultation

A clinical consultative service is available through each of the departments during the routine day, or out of hours if urgent consultation is required.

3.17 Feedback and Complaints

Feedback mechanisms, including complaints, are open to patients and laboratory users through the use of the HSE's 'Your Service, Your Say' which is accessible via the Naas General Hospital website (Homepage – Main menu – For Patients – Your Service Your Say) which links to the Patient Experience and Service User Feedback page.

Feedback and complaints may be received verbally, by letter/email or by completing a feedback form and leaving this in a dedicated Your Service Your Say postbox available throughout the hospital.

Feedback/complaints can also be made by contacting the Laboratory Manager or relevant laboratory department at the numbers listed in Section 1.6. Complaints will be followed up as the laboratory complaints procedure.

3.18 Impartiality

The Laboratory ensures that its activities are undertaken impartially and monitors and prevents commercial, financial or other pressures which may compromise impartiality.

3.19 Confidentiality

All patient data and results are treated as confidential in accordance with HSE Data Protection policies and guidelines including the HSE document 'Data Protection – It's Everyone's Responsibility'. GDPR training is mandatory for all staff within the laboratory.

4 REPORTING OF TEST RESULTS

Reporting of Results within the Hospital

The primary reporting mechanism for all reports for samples routinely processed at NGH (except Blood Transfusion) as well as those processed at Tallaght University Hospital (TUH) is the electronic LIS database. Hard Copy reports are also issued (with the exception of Warfarin Clinic patient results – only available electronically). Printed reports are issued from the Pathology Department and delivered to the requesting location via the PTS (Pneumatic Tube System). Blood Transfusion patient reports are in hard copy format only.

Reporting of Results to GPs

GPs may access their patient results through Healthlink. A hard copy report is also issued from NGH.

4.1 Accessing Laboratory Results on the LIS

Results are available for viewing on the LIS following authorisation. Instructions to gain access to laboratory results are available on Q Pulse (INFO-22; search word: lab), which includes the list of codes required to view cumulative results.

Histology results are available to view via the HSE intranet. Refer to Q Pulse (PPPG-360) search word: histo) for application form to view Histo results and instructions for use.

NVRL reports for in-patients are available electronically on LIS (Naas Mic lab section). GP and community NVRL reports are hard copy only.

Eurofins Biomnis results: GP's on healthlink will receive electronic reports. Results for NGH patients and GP's not on healthlink are available electronically via Cdxconnect.eurofins.com. Set up requires prior registration and approval. Set –up instructions are available on X/desktop icons/Eurofins Biomnis Results Access which also includes link to web-page. Hard copy reports are also reported unless Eurofins Biomnis have been informed directly by the service user that hard copy reports are not required.

4.2 Phoning/Communication of Results

Critical results (i.e. abnormal results in category for phoning) are phoned/communicated according to hospital policies. Refer to Sections 7.4, 8.4 and 10.5 for values phoned/communicated for Haematology/Coagulation, Clinical Chemistry and Microbiology.

Do not proceed with medical intervention on the basis of a verbal result only; always re-check the electronic version of the report.

5 EXTERNAL THIRD PARTY ASSESSMENT PROGRAMME

The Pathology Department participates in relevant external third party assessment schemes. This includes schemes operated by:-

- NEQAS (UK National External Quality Assurance Scheme)
- IEQAS (Irish External Quality Assurance Scheme)
- LAB QUALITY
- WEQAS (Welsh External Quality Assurance Scheme)
- LGC Standards
- QCMD (Quality Control for Molecular Diagnostics)

The above schemes are fully accredited.

A detailed list of assays and relevant schemes is available on request.

6 BLOOD TRANSFUSION

6.1 Introduction

The Blood Transfusion Laboratory is located in the Pathology Department on Level 3. Lists of the various therapeutic and diagnostic services provided are listed below. For any queries regarding Blood Transfusion, please contact extension 3040 or the transfusion scientist on call via switch out of hours.

Documentation that will help you with blood transfusion therapy are:

- **Blood Transfusion Manual:** NGH Guidelines on the administration of blood and blood products (available on Q Pulse: PPPG-157). Hardcopies also available in ICU, CCU, ED, Nursing Administration and in the laboratory).
- **National Blood Transfusion Patient Information Leaflet** - [https://hse-
ie.libguides.com/ld.php?content_id=33514354](https://hse.ie/libguides.com/ld.php?content_id=33514354)

6.2 Urgent Requests

The Doctor must phone the Laboratory (Ext 3040 or contact the Haematology/Blood Transfusion Medical Scientist on-call via switch) explaining the urgency.

- Group Specific Blood can be provided in 15 mins provided there is a current sample in the Blood Transfusion Laboratory.
- Group and Antibody Screen (urgent) can be provided in 30–40 mins.
- Group & Crossmatch can be provided in 45–60 mins (Antibody screen negative).
- Crossmatched units on a recently processed Group & Hold sample (Antibody Screen Negative) can be provided in 30 mins.
- Platelets are not stored on site and must be ordered from the National Blood Centre.
- **Plasma is a frozen product and must be thawed prior to issue. This takes approximately 40 minutes.**

N.B. If the antibody screen is positive there will be an increase in the time taken to provide compatible red cell units.




6.3 Transfusion Options in an Emergency

- Two units of O Rh D Negative red cells are available in the Issue Fridge at all times.
- A sample must be taken prior to administration of Emergency O Neg units and sent **immediately** for group and antibody screen so that the patient's blood group can be established (Refer to Guidelines on the Emergency use of Blood and Blood Products PPPG 81- Emergency Transfusion Guideline)
- The Laboratory must be informed immediately if the Emergency O Neg units are removed/ used.
- If the Laboratory has a current sample from the patient, group specific uncrossmatched blood can be available within 10-15 mins.

- Rh D Positive uncrossmatched blood may be issued to women above childbearing age (>55years) and to all men when O Rh D Negative blood is in short supply or where >6 units of RCC are required for Rh D Negative patients in consultation with a medical doctor and the Consultant Haematologist.

Urgent requests for other Blood Products / Tests- Phone 3040 or contact the Haematology/Blood Transfusion Medical Scientist on-call via switch.

6.4 Blood Products/Components for Transfusion

Blood Product/ Component	Specimen Type/ Requirements	Special Requirements	Turnaround Time
Human Albumin Solution (5% and 20%)	No Sample required	Refer to NGH Transfusion guidelines (PPPG 78)	10 mins
Red cell concentrate	Blood 1 x 7.5mL EDTA tube 	New sample required every 72 hrs if patient was transfused or pregnant in the previous 3 months Refer to NGH Transfusion guidelines (PPPG 159)	1- 2 hrs if antibody screen negative 2-4 hrs if antibody screen positive or longer if referral required.
Platelets	Blood 1 x 7.5mL EDTA tube 	Phone request well in advance of time required. No in-house stocks. Refer to NGH Transfusion guidelines (PPPG 71)	2-4 hours
Plasma	Blood 1 x 7.5mL EDTA tube 	Refer to NGH Transfusion guidelines (PPPG 151)	1 – 2 hours (to allow for thawing)
Prothrombin complex concentrate	No Sample required	Refer to NGH Transfusion guidelines (PPPG 156)	10 mins
Fibrinogen concentrate	No Sample required	Refer to NGH Transfusion guidelines (PPPG 152)	10 mins
Factor VIII/ Von Willebrand Factor Complex *	No Sample required	Refer to NGH Transfusion guidelines (PPPG 221) Contact the Blood Transfusion Laboratory	10 mins
Recombinant Factor VIII Concentrate *	No Sample required	Refer to NGH Transfusion guidelines (PPPG 221) Contact the Blood Transfusion Laboratory	10 mins
Factor IX Concentrate *	No Sample required	Refer to NGH Transfusion guidelines (PPPG 221) Contact the Blood Transfusion Laboratory	10 mins
Recombinant Factor VII a *	No Sample required	Refer to NGH Transfusion guidelines (PPPG 221) Contact the Blood Transfusion laboratory	10 mins

*Should only be given in conjunction with consultation with Consultant Haematologist on call for Blood Transfusion.

6.5 Blood Transfusion Laboratory Opening Hours

Routine Testing

09:30-17:00 Monday – Friday.

Routine Cut-off Times for Sample Acceptance

The latest time for receipt of routine samples is **15:45pm** Monday to Friday.

Samples from patients for elective surgery should be received in the Blood Transfusion Laboratory **not later than 15:45** on the day prior to the scheduled operation. The sample should be taken when the patient has been admitted and has a wristband in situ. **Safetrack is mandatory for the taking of all blood transfusion samples. The bottle and form must be labelled with Safetrack labels. Forms must be signed and patient's consultant should be stated. If you require Safetrack training contact the Haemovigilance officer on 3013 or bleep 217.**

In emergency situations only, a correctly labelled handwritten sample and form can be accepted to avoid delay, however a second sample must be sent to the lab to confirm the blood group if there is no previous group on file on the patient on the LIS. This second sample must be taken at a different time to the first sample received.

The sample should be sent to the laboratory for a 'Group and Hold' or Group and Crossmatch as per MSBOS (See PPPG -161). A blood group and antibody screen +/- crossmatch will then be performed and the sample will be retained.

6.6 Emergency on-call

An emergency on-call service is available for all urgent requests from 17:00-09:30 each day and 24hrs on Saturday, Sunday and Bank Holidays. Phone switch and ask to be put through to the haematology/blood transfusion scientist on call.

6.7 Repeat Samples

A repeat sample will be required if clotted, underfilled, haemolysed, mislabelled or expired sample bottles are received. A new sample is required if the patient has been discharged since the last sample was taken or every 72 hours if a patient has been transfused or pregnant in the past three months. If the laboratory has a suitable sample a phoned request for blood or blood products is acceptable.

6.8 Sample Request Form (NGH/BB/FM/001)

A completed pink and white blood transfusion request form must accompany all blood transfusion samples. **Safetrack labels are mandatory.** Place a Safetrack label on the form and ensure that all other information requested on the form is filled in. Include the following information on the request form:

- Patients Full name as stated on the wristband with correct spelling
- Date of Birth
- Hospital Number (MRN)

- Ward and Consultant
 - Products Required.
 - Date and time products required.
 - Time/ Date and Signature of person who requested the test.
 - Time/ Date and Signature of the person who took the sample.
-
- **Clinical Details** Surgical procedure, disease state, and transfusion and pregnancy history. Clinical details are essential particularly for immunosuppressed or pregnant patients who may have special requirements e.g. CMV negative and/or irradiated blood products.
 - **Special Requirements:** It must be clearly stated on the request form if CMV Negative or Irradiated products are required for particular patients. If in doubt see guidelines in Transfusion Manual (PPPG 78) Procedure for Prescribing Blood and Blood Products.

Safe Track labels must be on forms and samples and all other relevant information and signatures must be included. Addressograph labels are only acceptable on the request form if a Safetrack label is also present.

6.9 Sample Labelling Policy

Use Safetrack to label samples and request forms.

If Safetrack is not available:

The sample **MUST** be labelled by hand with details **taken from the wristband, not addressograph labels in chart and confirmed verbally by the patient, if possible.**

A handwritten sample must have the following minimum legible information:

- Full name including names in brackets as it appears on the wristband with correct spelling
- Date of Birth
- Hospital Number
- Signature of the person who took the sample.
- Date and time sample taken

Also include:

- Location
- Gender

NB:

Information on patient's wristband, request form, and sample must be identical – No abbreviations to be used.

If Safetrack out of use/not available all writing on sample must be clear and legible.

Samples not meeting these minimum requirements will not be accepted and a new sample will have to be obtained.

Please do not label samples with fine/felt tip pens, as these tend to smudge.

PAS/Symphony Down Time

In the event of PAS/Symphony down time, refer to ED policy for labelling and identifying of patients.

6.10 Sending the samples to Laboratory

- Samples can be sent via Pneumatic Tube system to Specimen Reception 3033.
- Always place sample in plastic biohazard bag.
- All urgent requests should be accompanied by a phone call to the blood transfusion laboratory (3040) or the scientist on-call (via switch).

6.11 Telephone Requests Policy

- A crossmatch may be requested by phone if a suitable sample is held in the laboratory. Samples are held for a minimum of 14 days.
- A new sample for crossmatching is required every 72 hours if the patient has been transfused or become pregnant in the previous 3 months. A new sample must be taken if the patient has been discharged since the last sample was drawn.
- The following details must be given when phoning requests:
Patient's name and hospital number, D.O.B, ward, consultant, product, amount required, date and time required, reason for transfusion, name of requesting medical doctor and name of person phoning the request.

6.12 Collection/Delivery of Blood and Blood Products

- Crossmatched blood will be placed in the issue fridge for collection.
- The Issue Fridge is only accessible to persons trained in operating Blood Track. For training please contact the Haemovigilance office (3013) or the Blood Transfusion Laboratory (3040).
- Emergency access to O RhD Negative units is available.
- Blood must be transported in hospital approved blood transit bags. These are available for blood collection at the issue fridge. These bags can be used once and then disposed of in recycling waste.
- **In emergency situations a blood cooler box is available which can store up to 5 units of blood at 2-6°C.** This enables blood to be at the patient's side for quick and easy access until the emergency is over. The box must be re-closed securely after the removal of each unit to maintain temperature.
- If the blood is not required, please return it to the issue fridge within 30 minutes of removal from monitored issue fridge. (Inform laboratory staff member).
Blood out of the fridge for > 30 mins cannot be returned to the issue fridge. If returning blood which has been out of the fridge for >30 mins inform a blood transfusion laboratory staff member or the haematology/blood transfusion medical scientist on-call via switch. Blood Track will alert you that units have been out of the fridge for greater than 30 minutes and ask you to contact the transfusion scientist.
- Wards will be phoned when platelet concentrate and plasma are ready for collection. In some circumstances, laboratory staff may deliver to the wards.
- Human albumin solution, Fibrinogen concentrate, Factor VIII concentrate, Factor VII concentrate, Factor IX concentrate and Prothrombin Complex Concentrate are

available in the blood transfusion laboratory for collection. Please phone 3040 to order required products.

- A pink traceability slip is attached to each blood product issued. The administrator of the product must sign this slip with date and time and place in the red traceability label box in each clinical area once the transfusion of the product has started.

6.13 Return of unused Blood/Products to laboratory

It is important for accurate record keeping and reduction of wastage that all unused blood or blood products are returned to the laboratory as soon as possible. When returning blood/blood products for any reason to the blood transfusion laboratory, please phone 3040 or call the medical scientist on-call to arrange return.

6.14 Disposal of empty Blood/Product packs

Following uncomplicated transfusion – dispose at ward level. See NGH Guidelines for administration of blood and blood products available in each clinical area.

- **Following Suspected Transfusion Reaction**

All blood/ blood product packs with giving set attached must be returned to the blood transfusion laboratory accompanying all the relevant samples and forms. Full details of sample requirements are provided at the back of the blood transfusion prescription booklet.

Refer to “**Management of Transfusion Reactions (PPPG 155) and Procedure for investigating and reporting serious adverse events, near miss events and non conformances (PPPG 364)**” in NGH Guidelines for administration of Blood and Blood Products available in each clinical area.

6.15 Maximum Surgical Blood Ordering Schedule (M.S.B.O.S.)

These are guidelines for the ordering of blood for surgical procedures. When filling out a blood transfusion request form for a patient pre-op please indicate the type of surgery the patient will be undergoing.

Group and Hold (G&H):

The blood group and hold system has proved efficient and effective. This involves requesting a group and hold in advance of proposed procedures and storing the sample for further testing if required.

- A blood group and antibody screen is performed on the sample and the sample is retained.
- If the antibody screen is negative, crossmatched blood can be available within 40 minutes of a phoned request.
- If the screen is positive, identification of the antibody must be completed before compatible units become available. In this event the laboratory will inform the ward/doctor of any delay.

Group and Crossmatch:

If a group and crossmatch is requested, the number of units specified will be cross-matched and reserved for a specific patient for a 48hr period, after which the blood will be returned to stock unless otherwise requested.

Notes

- The maximum blood ordering schedule can be bypassed (consultant, anaesthetists or senior registrar) by phoning the blood transfusion laboratory at 3040.
- A new sample is required for each in-patient episode.
- Samples must be in the blood transfusion laboratory by 15.45 on the last routine working day prior to surgery.
- **Use Safetrack** to label samples and request forms. If Safetrack is unavailable all sections of the request form and sample must be handwritten and adhere to hospital policy.

Maximum Blood Ordering Schedule – Naas General Hospital

Procedure	Action	Procedure	Action
General Surgery		General Surgery cont'd	
Abdominal Peritoneal Resection	4 units	Laparotomy Elective Exploratory Emergency	G&H 2 units
Anterior Resection	2 units	Lapcholecystectomy day case In-patient	None G&H
Appendectomy	None	Laparoscopic Colectomy	G&H
Bowel Resection	2 units	Laparoscopic Procedures	G&H
Breast Biopsy	None	Ligation of Veins	None
Breast Reconstruction	G&H	Liver Biopsy	G&H
Colostomy Closure/revision	G&H	Parathyroidectomy	G&H
Diagnostic Laproscopy	G&H	Thyroidectomy/Lobectomy	G&H
EUA	None	Sigmoid colectomy	2 units
Fundoplasty/fundoplication	G&H	Sigmoidectomy	2 units
Gastrectomy Partial	2 units	Splenectomy Elective	G&H
Total	4 units		
Oesophageal	4 units		
Gastrojejunostomy	2 units	Sub cut Mastectomy	G&H
Haemorrhoidectomy	G&H		
Hemicolectomy	2 units		
Hernia /Inguinal/ Hiatus	None		

7 HAEMATOLOGY

7.1 Cut-off Times for Sample Processing and Referral (and availability On-Call)

Day	Deadline Times
Monday to Friday Samples tested in NGH	Samples for: ESR, Infectious Mononucleosis Screening, Sickle Cell Screening which reach lab by 13.00 will be reported by 17:00 <i>(These tests are generally not processed on call)</i> FBC, Reticulocytes and Coagulation which reach lab by 16.00 will be reported by 17:00 <i>(These tests are processed on call)</i>
Samples for Referral	Samples for Referral which arrive in the lab by 09:30am will be referred on the same day. Samples received after 9:30am or requiring demand management will be dispatched within 48 hrs. Samples for Thrombophilia screens or any external coagulation testing (green tops) need to reach the Lab by 09:30 as they need to be sent and processed on the same day. All positive malaria screens are referred for confirmatory testing.

Routine samples arriving after the cut-off times may not be analysed until the next working day.

7.2 Special Protocols

The protocol for bone marrow sampling is available on the Hospital Q pulse system. - PPPG-26

7.3 Retrospective Requesting

Haematology and coagulation samples are kept for a period post analysis. Analyses of additional tests are subject to the stability of the analyte. Refer to the sample list at the end of this guide regarding time restraints from time of sampling to time of testing. If a further test is required on a sample that is already in the laboratory which falls within the necessary time limit for retrospective testing perform the following:

For in-patients: Fill out the appropriate “Request form for Additional Tests (In-house) on Sample Previously sent to Haematology/Coagulation” – NGH/HAEM/FM/012. This form is for in-house Haematology and Coagulation tests as specified on the back of the request form.

For external patients: Contact the Haematology laboratory on 045-843041/3045.

7.4 Communication of Abnormal Results

Abnormal results falling outside defined limits will be communicated to the requesting source as outlined in section 4.2

Abnormal/urgent laboratory results and details of unsuitable samples will not be phoned to ICU, CCU, ODW or the warfarin clinic (clinic day or other days).

The Symphony alert system will be used to send alerts re critical values to patients in the ED department and AMAU.

Where repeated results are abnormal, further telephone calls/ symphony alerts will not be made unless there is a significant deterioration.

If a result is telephoned to a team for a patient who has since been transferred or discharged, the team and not laboratory staff should accept the result and follow it up as appropriate.

Table 7 (a): Critical Values for Communication: Hospital Patients (Routine and On-Call hours)

Analyte/Test	Result	Comment
Haemoglobin	< 8.0 g/dL and >18.0g/dL (F) >20.0g/dL (M)	
Neutrophils	<0.5 x 10 ⁹ /L	
Platelets	< 20 x 10 ⁹ /L and >800 x 10 ⁹ /L	
Infectious Mononucleosis Screen	Positive	
PT	>30 secs	If patient is not on warfarin
APTT	>70 secs	
INR results	> 6.0	
Fibrinogen	<1.0 g/L	
Malaria Screen	All positive malaria screens	
WBC	WBC abnormality of immediate clinical significance	

Table 7 (b): Critical Values for phoning for GP Patients within GP Routine Hours

Analyte/Test	Result	Comment
Haemoglobin	< 8.0 g/dL and >18.0g/dL (F) >20.0g/dL (M)	
Neutrophils	<1.0 x 10 ⁹ /L	
Platelets	< 50 x 10 ⁹ /L and >800 x 10 ⁹ /L	
Infectious Mononucleosis Screen	Positive	
PT	>16 secs	If this is the first abnormal result, and, if the patient is not on warfarin
APTT	>38 secs	If this is the first abnormal result, and, if the patient is not on anticoagulation therapy.
INR results	> 4.0	For patients on warfarin.
APTT Ratio	>4.2	For patients on heparin.
Fibrinogen	<1.4 g/L	

Results for hospital patients will be phoned to the relevant personnel as described in Section 4.2

Table 7 (c): Critical Values for phoning for GP Patients outside GP Routine Hours

Analyte/Test	Result
Haemoglobin	<7.0 g/dL
Neutrophils	<0.5 x 10 ⁹ /L
Platelets	<50 x 10 ⁹ /L
Suspicion of new leukaemia	Suspicion of new leukaemia
INR	>6.0

7.5 Urgent Haematology Clinical Advice

If urgent clinical advice is required regarding a Haematological problem:

During routine hours please contact switch in Tallaght University Hospital and ask to be put through to the Haematology team.

During emergency on call hours please contact switch in Naas General Hospital and ask to be put through to the Haematology Consultant on call.

7.6 Patients for Haematology Review

A clinical consultative service is usually available through the Consultant Haematologist, by **pre-arrangement** only. The Consultant Haematologist usually attends NGH two days per week.

To send a referral, or to request a haematological review by the Consultant Haematologist, please fax a brief letter to 01 4145908 including the contact details of the requester. On review of the letter, the Consultant Haematologist will arrange to see patients in the Out Patients Department or in the Day Ward in Tallaght Hospital or in NGH as clinically appropriate. If a patient is unfit to travel to Tallaght, please indicate this in the referral letter.

7.7 Haematology Reference Intervals / Ranges

Note: All reference intervals listed are correct at time of going to press. Occasionally it may be necessary to change various reference intervals. Always take note of reference intervals and comments on individual reports.

Table 7 (d): Haematology Reference Intervals (3 months – 6 years)

	3 Months - 4 yrs	4-6 yrs	
		Female	Male
RBC (x 10 ¹² /L)	3.7-5.3	3.93-4.99	3.93-4.99
HB (g/dL)	10.5 –14.9	11.0-13.8	11.0-13.8
HCT (Ratio)	0.33 –0.45	0.32-0.40	0.32-0.40
MCV (fl)	70-87	76.4-87.2	76.1-86.7
MCH (pg)	23.0-31.0	25.6-30.0	25.5-29.6
MCHC (g/dL)	30.0-36.5	32.9-35.7	33.05-35.5
RDW	11.5-14.9	11.5– 13.9	11.8-14.94
PLT (x 10 ⁹ /L)	150-450	193-489	205-450
WCC (x 10 ⁹ /L)	5.0-15.0	5.0-12.1	4.8-11.5
NEU (x 10 ⁹ /L)	1.5-7.0	1.7-7.6	1.7-7.6
LYM (x 10 ⁹ /L)	2.0-5.0	1.6-4.2	1.6-4.2
MON (x 10 ⁹ /L)	0.3-1.1	0.33-1.16	0.33-1.16
EOS (x 10 ⁹ /L)	0.2-2.0	0.05-0.95	0.05-0.95
BAS (x 10 ⁹ /L)	0.0-0.1	0.0-0.50	0.0-0.74
ESR (mm)	0-20	0-20	0-20
Reticulocyte (x 10 ⁹ /L)	25.6-103	25.6-103	25.6-103

**Reference range of associated/adjacent large hospitals used. Children's reference ranges from 'Haematological Reference Ranges for School Children' Taylor et al Clinical and Laboratory Haematology, Volume 19, Issue 1, Pages 1-15 2003.*

Table 7 (e): Haematology Reference Intervals (7-10 years)

	7-8 Yrs		9-10 Yrs	
	Female	Male	Female	Male
RBC (x 10 ¹² /L)	3.98-5.11	3.98-5.11	4.08-5.06	4.08-5.06
HB (g/dL)	11.3-14.2	11.3-14.2	11.9-14.9	11.9-14.9
HCT (Ratio)	0.33-0.41	0.33-0.41	0.34-0.42	0.34-0.42
MCV (fl)	77.4-88.3	75.4-87.3	77.1-88.6	76.3-89.5
MCH (pg)	26.3-31.1	25.5-30.4	26.8-31.1	26.3-30.7
MCHC (g/dL)	33.2-36.2	33.4-35.7	33.3-35.7	33.3-35.5
RDW	11.4-13.68	11.5-14.1	11.2-13.3	11.6-13.4
PLT (x 10 ⁹ /L)	191-439	194-420	201-384	174-415
WCC (x 10 ⁹ /L)	5.2-11.7	4.9-10.5	4.7-10.0	4.4-10.6
NEU (x 10 ⁹ /L)	1.8-7.42	1.7-5.9	1.7-6.4	1.7-6.1
LYM (x 10 ⁹ /L)	1.8-4.3	1.7-3.7	1.7-3.9	1.4-3.9
MON (x 10 ⁹ /L)	0.32-1.21	0.32-1.21	0.33-0.99	0.33-0.99
EOS (x 10 ⁹ /L)	0.08-1.07	0.08-1.07	0.06-1.03	0.06-1.03
BAS (x 10 ⁹ /L)	0.02-0.60	0.01-0.62	0.02-0.54	0.01-0.35
ESR (mm)	0-20	0-20	0-20	0-20
Reticulocyte (x 10 ⁹ /L)	25.6-103	25.6-103	25.6-103	25.6-103

**Reference range of associated/adjacent large hospitals used. Children's reference ranges from 'Haematological Reference Ranges for School Children' Taylor et al Clinical and Laboratory Haematology, Volume 19, Issue 1, Pages 1-15 2003.*

Table 7 (f): Haematology Reference Intervals (11 years – 14 years)

	11-12 Yrs		13-14 Yrs	
	Female	Male	Female	Male
RBC (x 10 ¹² /L)	4.13-5.19	4.13-5.19	4.03-5.05	4.33-5.42
HB (g/dL)	12.1-14.7	12.1-14.7	12.1-14.6	12.4-15.6
HCT (Ratio)	0.350-0.426	0.350-0.426	0.352-0.43	0.355-0.454
MCV (fl)	77.5-89.6	78.0-89.5	79.7-93.0	78.8-91.5
MCH (pg)	26.0-31.2	26.6-30.9	27.3-32.3	26.9-31.8
MCHC (g/dL)	33.0-35.6	33.0-35.6	33.2-35.2	33.42-35.38
RDW	11.2-13.13	11.5-13.43	11.5-14.63	11.8-14.1
PLT (x 10 ⁹ /L)	180-387	178-382	188-429	183-370
WCC (x 10 ⁹ /L)	4.8-10.4	4.0-9.6	4.9-10.7	4.2-9.3
NEU (x 10 ⁹ /L)	1.6-6.2	1.6-5.6	1.8-7.2	1.7-5.4
LYM (x 10 ⁹ /L)	1.5-3.7	1.5-3.7	1.4-3.6	1.4-3.6
MON (x 10 ⁹ /L)	0.36-1.0	0.31-0.92	0.38-1.0	0.26-0.87
EOS (x 10 ⁹ /L)	0.06-1.12	0.06-1.12	0.05-0.64	0.05-0.64
BAS (x 10 ⁹ /L)	0.01-0.38	0.01-0.38	0.01-0.43	0.01-0.43
ESR (mm)	0-20	0-20	0-20	0-20
Reticulocyte (x 10 ⁹ /L)	25.6-103	25.6-103	25.6-103	25.6-103

**Reference range of associated/adjacent large hospitals used. Children's reference ranges from 'Haematological Reference Ranges for School Children' Taylor et al Clinical and Laboratory Haematology, Volume 19, Issue 1, Pages 1-15 2003.*

Table 7 (g): Haematology Reference Intervals (15 years – Adult)

	15-18 Yrs		Adult	
	Female	Male	Female	Male
RBC (x 10 ¹² /L)	4.06-5.07	4.46-5.61	3.8-5.8	4.9-6.5
HB (g/dL)	11.8-15.1	13.2-16.6	11.5-16.5	13.0-18.0
HCT (Ratio)	0.352-0.440	0.385-0.490	0.37-0.47	0.4-0.54
MCV (fl)	79.0-93.7	78.9-92.5	80-96	80-96
MCH (pg)	26.7-32.5	26.9-31.9	27-34	27-34
MCHC (g/dL)	33.0-35.5	33.49-35.2	31.0-36.5	31.0-36.5
RDW	11.4-14.28	11.7-13.91	10.0-16.0	10.0-16.0
PLT (x 10 ⁹ /L)	170-359	189-374	150-450	150-450
WCC (x 10 ⁹ /L)	4.2-10.6	4.2-12.2	4.0-11.0	4.0-11.0
NEU (x 10 ⁹ /L)	1.8-6.5	1.8-6.1	2.0-7.5	2.0-7.5
LYM (x 10 ⁹ /L)	1.3-3.4	1.3-3.4	1.5-4.0	1.5-4.0
MON (x 10 ⁹ /L)	0.35-1.06	0.31-0.86	0.2-0.8	0.2-0.8
EOS (x 10 ⁹ /L)	0.05-0.57	0.05-0.57	0.04-0.4	0.04-0.4
BAS (x 10 ⁹ /L)	0.01-0.17	0.01-0.29	0.01-0.1	0.01-0.1
ESR (mm)	0-20	0-20	0-20	0-20
Reticulocyte (x 10 ⁹ /L)	25.6-103	25.6-103	25.6-103	25.6-103

**Reference range of associated/adjacent large hospitals used. Children's reference ranges from 'Haematological Reference Ranges for School Children' Taylor et al Clinical and Laboratory Haematology, Volume 19, Issue 1, Pages 1-15 2003.*

In house reference range review performed for Adult Reference ranges. Contact lab for further information.

Table 7 (h): Coagulation Reference Intervals

Test/Units	Range	Comment	Reference Range Source
PT (secs)	9.6-11.8		<i>*Reference range of associated/adjacent large hospitals used.</i>
APTT (secs)	20.8-30.8		
Fibrinogen (g/L)	1.5-4.0		
D- Dimer (mg/L FEU)	<0.44 mg/L FEU	The cut off value for outruling DVT, in conjunction with a low probability score is <0.5 mg/L FEU	<i>*Application sheet for D-Dimer from manufacturer.</i>

Table 7 (i): Coagulation Therapeutic Ranges

Test	Comment
INR	Diagnosis dependent
APTT Ratio	Diagnosis dependent

7.8 Interferences

Many tests are subject to interference. This may be due to biological/day-to-day variation, pre-analytical variation (e.g. haemolytic, lipaemic or icteric samples), analytical variation (e.g. specific method used) and interactions with various drugs. This should be kept in mind when unusual or unexpected results are obtained.

Some important drug interferences are listed in the table below. This list is not exhaustive; other drugs may interfere with certain tests. Contact the Haematology laboratory if further information required.

Table 7 (j): Interferences

Test	Interfering Substance(s)	Details	Source
Prothrombin Time (PT)	Hirudin	Interference may result in prolonged PT	Reagent insert
	Oritavancin	Interference may artificially prolong PT & INR for up to 24hours	Reagent insert
	Daptomycin (Cubicin)	May cause false prolongation of PT & INR. Suggest that patients on Daptomycin have PT checked pre-dose	Journal of Thrombosis & Haemostasis 2007
Activated Prothrombin Time (APTT)	Conjugated oestrogen therapy	Can cause decrease in APTT	Reagent Insert
	Diphenylhydantoin Heparin Warfarin Naloxone Radiographic agent administration	Can cause increase in APTT	Reagent Insert
	Oritavancin	Can artificially prolong the APTT for up to 48 hours post administration	Reagent Insert
	Parenteral feeding	May affect APTT results	Reagent Insert

8 CLINICAL CHEMISTRY

8.1 Introduction

The Clinical Chemistry Laboratory is located on level 3 of Naas General Hospital. Advice relating to the service or this manual should be addressed to the Consultant Chemical Pathologist or other senior staff.

8.2 Retrospective requesting

Clinical Chemistry specimens are retained for a period post analysis. Analysis of additional tests is subject to the stability of the analyte and provided the original sample is suitable. To request a further test on a sample that is already in the laboratory:

- (1) In patient requests: Fill out the appropriate request form 'Additional Tests (In-house) on Sample Previously sent to Clinical Chemistry' - NGH/BIO/FM/007. This is for **in-house clinical chemistry tests (as specified on the back of the request form)**. This form is not to be used for referral tests or add on tests for other departments. Add on tests for other departments/external labs will not be facilitated by this request form.
- (2) External sources : Contact the laboratory on ext. 3033

Table 8(a) Tests not suitable for add on requesting

hCG+ β (for pregnancy)
Ethanol (Subject to sample suitability)
PSA

8.3 Therapeutic Drug Monitoring

All drugs must be requested using generic, not trade names to ensure clarity. Please refer to current edition of the Irish National Formulary (INF) which is supplied by pharmacy to each ward.

8.4 Protocol for Communicating Critical Results

Abnormal results falling outside defined limits (see table below) will be communicated to the requesting source according to NGH/PATH/SOP/006 "Procedure for reporting of results and advisory services in Clinical Chemistry, Haematology/Coagulation and Microbiology".

Table 8(b): Critical Values for Communicating Critical Results.

Analyte	Units	In-Patients & ED	Out Patients and GPs.
Sodium	mmol/L	< 125 >150	< 125 >150
Potassium	mmol/L	< 2.5 > 6.0 < 3.0 with any Haemolysis	<2.8 >6.0 < 3.0 with any Haemolysis
Urea	mmol/L	Urea >12 mmol/L with normal Creatinine (first occurrence) Urea > 12 mmol/L with Creatinine >200 μ mol/L 200 μ mol/L (first occurrence)	Urea >12 mmol/L with normal Creatinine (first occurrence) Urea > 12 mmol/L with Creatinine >200 μ mol/L 200 μ mol/L (first occurrence)

Analyte	Units	In-Patients & ED	Out Patients and GPs.
Glucose	mmol/L	<2.8 >20.0	<2.8 >20.0
Troponin T-hs	ng/L	>100 Where not available due to SI interferences	Not applicable
CK	U/L	>500 (first occurrence) >5000	>500 (first occurrence) >5000
CRP	mg/L	>350	>350
Calcium (with Albumin <20 g/L)	mmol/L	<1.9	<1.9
Adjusted Calcium	mmol/L	<1.9 >2.9	<1.9 >2.9
Phosphate	mmol/L	<0.46 >3.0	<0.46 >3.0
Magnesium	mmol/L	<0.41 >1.9	<0.41 >1.9
Total Protein	g/L	<50 (ICU - first occurrence) >100	<50 (first occurrence) >100
Albumin	g/L	< 25 (first occurrence)	<25 (first occurrence)
Total Bilirubin	µmol/L	>250 (first occurrence)	>250 (first occurrence)
ALT	U/L	>500 (first occurrence)	>500 (first occurrence)
AST	U/L	>500 (first occurrence)	>500 (first occurrence)
Amylase	U/L	>200 (first occurrence)	>200 (first occurrence)
Uric Acid	µmol/L	>750	>750
PSA	µg/L	>20 (first occurrence)	>20 (first occurrence)
hCG + β (in pregnancy)	IU/L	>2	No requirement
Lithium	mmol/L	<0.20 >1.00	<0.20 >1.00
Ethanol	mg/dl	>250	>250
Paracetamol	mg/L	All reportable levels	All reportable levels
Salicylate	mg/L	All reportable levels	All reportable levels
TFT		TSH >100 IU/L FT4 >100 pmol/L Grossly abnormal results (first occurrence) eg TSH>75 IU/L, FT4 >75 pmol/L All clinical details - pregnant	TSH >100 IU/L FT4 >100 pmol/L Grossly abnormal results (first occurrence) e.g. TSH>75 IU/L, FT4 >75 pmol/L All clinical details - pregnant
Triglyceride	mmol/L	>20	>20
CSF Glucose	mmol/L	All results	Not applicable
CSF Total Protein	mg/dL	All results	Not applicable

While staff in the clinical chemistry laboratory will do their best to adhere to the above guidelines it is the duty of all doctors to follow up in a timely fashion on the results of clinical chemistry investigations requested on patients under their care.

8.5 Clinical Chemistry Investigations during On-Call Hours

The emergency service is available on a 24-hour, 365 day basis. The range of tests outside routine hours is restricted – see below. In certain circumstances, other tests may be requested but these would require discussion with the person on-call or with the Consultant Chemical Pathologist on-duty.

Results are available via the Laboratory Information System once authorised in the laboratory.

Investigations available out of hours
<ul style="list-style-type: none"> • Renal, Liver, Bone, Lipids profiles. • AST • LDH, Amylase, Magnesium • CRP • Glucose • Urate • hCG + β • Troponin T • NT-proBNP • CK • Salicylate, Paracetamol, Ethanol • CSF Glucose and Protein • Spot urine Sodium, Potassium • Acid-Base, Blood Gases, Carboxyhaemoglobin, Meth Hb
Investigations available only if approved by Consultant Chemical Pathologist
<ul style="list-style-type: none"> • The Emergency Service cannot accommodate routine investigations. These will be analysed on the next working day. • Urine Chemistries not mentioned above • Other Chemistries not mentioned above (Lithium, TFTs) • Referred tests (for example urine and serum osmolality, digoxin)

Table 8(c): Investigations available out of hours

Restricted investigations must be discussed in the first instance with the on-call Consultant Chemical Pathologist. Further details can be obtained from the on-call scientist.

Notification of Out of Hours Work

Outside routine working hours (Mon-Fri 5pm to 8am, Saturday, Sunday and Bank Holiday 24 hours) the on-call scientist must be phoned to let them know samples are being sent to the laboratory. The Clinical Chemistry on-call contact number is 087-1207387.

8.6 Adult Reference Ranges

Adult male and non pregnant adult female reference values for tests analysed in the clinical chemistry laboratory are tabulated below. Please note that reference intervals for urine vary significantly with body size (hence with sex and age), diet and renal function. Reference ranges are method dependent and can change if there has been a change in assay methodology. Changes in reference ranges will be highlighted on report forms.

**Table 8(d): General Clinical Chemistry Common Profiles
Adult Male and Non Pregnant Female Reference Ranges**

Analyte	Reference Ranges	Units	Reference
Renal Profile:			
Sodium	135-145	mmol/L	1
Potassium	3.5-5.0	mmol/L	1 (serum) 2 (plasma)
Urea	2.0 – 7.0	mmol/L	3
Creatinine	59-104(M) 45-84 (F)	µmol/L	4
eGFR	Refer to Section 8.6.1		
Liver Profile:			
Total Protein	65-85	g/L	1
Albumin	35-50	g/L	1
Total Bilirubin	< 17	µmol/L	1
Gamma Glutamyltransferase (GGT)	< 60 (M) < 40 (F)	U/L	4
Alkaline Phosphatase (ALK) (Age related ranges available from Lab)	40-130(M) 35-105 (F)	U/L	1
Alanine Aminotransferase (ALT)	1 - 45 (M) 1 - 35 (F)	U/L	3
Bone Profile:			
Calcium	2.15-2.55	mmol/L	5
Adjusted calcium*	2.15-2.55	mmol/L	5
Albumin	35-50	g/L	1
Phosphate	0.80-1.40	mmol/L	1
Alkaline Phosphatase (ALK) (Age related reference ranges available)	40-130 (M) 35-105 (F)	U/L	1
Lipid Profile:			
	Target Levels		
Cholesterol	<5.0	mmol/L	6
Triglyceride	<1.7	mmol/L	6
High Density Lipoprotein (HDL)	>1.0 (M) >1.2 (F)	mmol/L	6
Low Density Lipoprotein† (cLDL)	<3.0	mmol/L	6

*Adjusted Calcium = measured calcium mmol/L + ((40 – measured albumin g/L) x 0.02) mmol/L
Note: For albumins < 20 g/L the corrected calcium is only an approximation. Ref. range source: 5

† calculated LDL = (cholesterol) – (HDL-cholesterol) – (triglyceride/2.22). Ref. range source: 5

**Table 8(e): Additional Blood Chemistries:
Adult Male and Non Pregnant Female Reference Ranges**

Additional Blood Chemistries	Reference Ranges	Units	Reference
Chloride	98-107	mmol/L	4
Magnesium	0.7-1.0	mmol/L	1
Uric Acid	200- 420 (M) 140 – 340 (F)	µmol/L	1
C- Reactive Protein (CRP)	< 5	mg/L	4
Additional Enzymes:			
Amylase	<100	U/L	1
Lactate Dehydrogenase (LDH)	135 - 220	U/L	1
Aspartate Aminotransferase (AST)	1 -35 (M) 1- 30 (F)	U/L	3
Cardiac Markers:			
Creatine Kinase (CK)	< 190 (M) < 170 (F)	U/L	4
Troponin T	< 14	ng/L	4
NT pro-BNP	< 300	pg/ml	7
Therapeutic Drug monitoring:			
Lithium – Maintenance	0.2- 1.0	mmol/L	2
Mania	0.6-1.0	mmol/L	

Table 8(f): Toxicology- Adult Male and Non Pregnant Female Decision Levels.

Toxicology Plasma	Adult decision levels	Reference
Ethanol	50-100 mg/dl: Flushing, slowing of reflexes, impaired visual acuity >100 mg/dl: Depression of CNS >400mg/dl: Fatalities reported	4
Paracetamol	Refer to IMB Guidelines	8
Salicylate	Therapeutic: Analgesia/Antipyresis: <60 mg/L Anti-inflammatory: 150 – 300 mg/L Toxic: >300 mg/L	5

Table 8(g): Endocrinology -Adult Male and Non Pregnant Female Reference Range

Endocrinology - Plasma	Reference Range	Units	Reference
Free Thyroxine (Free T4)	12 - 22	pmol/L	4
Thyroid Stimulating Hormone (TSH)	0.30 - 4.20	mU/L	1
PSA (Caucasian)	0.0 - 1.9 (< 50 yrs) 0.0 – 2.9 (50 – 59 yrs) 0.0 – 3.9 (60 – 69 yrs) 0.0 – 4.9 (70+ yrs)	µg/L	9
	Detection Level		
*hCG+β	< 2	IU/L	1
hCG+β Post-Menopausal Women	≤7	IU/L	1

***The best test for establishing pregnancy, especially in the early stages and in case of ectopic pregnancy, is the blood hCG +β test. This is available from the laboratory 24/7 and is fully INAB accredited.**

We recommend the use of laboratory blood hCG +β test instead of urinary near-patient pregnancy testing. Please send blood hCG+β in a separate Li-Hep sample (Orange Top)

Table 8(h): CSF Adult Male and Non Pregnant Female Reference Ranges

CSF	Reference Range	Units	Reference
CSF Glucose	Child : 3.3- 4.5 Adult : 2.2- 3.9 CSF glucose values should be approximately 60% of the plasma glucose values and must always be compared with concurrently measured plasma values for adequate clinical interpretation.	mmol/L	5 1
CSF Protein	15-45	mg/dL	4

Table 8(i): Urine Chemistries Adult Male and Non Pregnant Female Reference Ranges

Analyte	Reference Range	Units	Reference
Sodium	M 40 – 220 F 25 - 285	mmol/24 hrs	3
Potassium	M/F 25-125	mmol/ 24 hrs	4
Calcium	2.5-7.50	mmol/ 24 hrs	4
Phosphate	13-42	mmol / 24 hrs	4
Creatinine Clearance	M/F 66-143	ml/min	4
24hr Urinary Creatinine	M 9-19 F 6-13	mmol / 24 hrs	4
Protein	M/F < 0.150	g/24 hrs	1
Sodium (Spot)	Decision point < or >20 mmol/L		10
Potassium (Spot)	Decision point < or >20 mmol/L		11
Albumin/Creatinine Ratio	M < 2.5 F < 3.5	mg/mmol	12
PCR (Protein Creatinine Ratio)	Refer to Section 8.6.2		
Calcium: Creatinine Ratio	0.07- 0.41	mmol/mmol	13

References:

1. Adapted from Roche Cobas kit insert.
2. Adult Medicines Guide 2014/2015. Tallaght Hospital and Naas General Hospital. (Ext.reference Bio 070).
3. Adapted from Tietz Textbook of Clinical Chemistry and Molecular Diagnostics, 5th edition. (Ext. reference Bio/006)
4. Roche Cobas kit insert.
5. Tietz Textbook of Clinical Chemistry and Molecular Diagnostics, 5th edition. (Ext. reference Bio/006).
6. 2003 European Guideline on Cardiovascular Disease Prevention in Clinical Practice. Third Joint Taskforce of European and other Societies on Cardiovascular Disease Prevention in Clinical.(Ext. reference Bio/072)
7. The International Collaborative of NT-proBNP Study. NT-proBNP testing for diagnosis and short-term prognosis in acute destabilized heart failure: an international pooled analysis of 1256 patients, 2006. (Ext reference Bio/002).
8. Irish Medicines Board Guidelines. Paracetamol overdose: New guidelines on treatment with intravenous acetylcysteine. (Ext. reference Bio/060).
9. National Prostate Cancer GP Guidelines 2018. NCCP/HSE. (Ext reference Bio/075)
10. Hyponatraemia: why it matters, how it presents, how we can manage it. Cleveland Clinical Journal of Medicine. 2006. (Ext. reference Bio/003).
11. Serum Potassium, Chapter 195, Clinical Methods 3rd edition. The History, Physical and Laboratory Examinations, 1990. (Ext reference Bio/004).
12. HSE: A Practical Guide to Integrated Type 2 Diabetes Care, 2016. (Ext. reference Bio/077).
13. Established by St Vincent's University Hospital, Elm Park, Dublin 4. (Ext reference Bio/034)

Table 8(j): Glucose Adult Male and Non Pregnant Female Reference Ranges

Glucose Levels	Reference Ranges	Units
Fasting Glucose	< 6.0	mmol/L
Random Glucose	< 7.8	mmol/L
Timed Glucose	< 7.8	mmol/L
Unexplained Hypoglycaemia below the following cut-off should be considered for further investigation:		
<ul style="list-style-type: none"> Fasting venous plasma glucose ≤ 2.5mmol/l 		
Albumin/Creatinine ratio	>2.5 mg/mmol indicates microalbuminuria (M) >3.5 mg/mmol indicated microalbuminuria (F)	
Haemoglobin A1c Target values	20 – 42 mmol/mol (IFCC)	

The following summarises recommendations for the diagnosis of diabetes and intermediate hyperglycaemia. (Department of Health/ICGP/Irish Endocrine Society Guidelines 2008), except that the upper target of ≥ 11.1 mmol/L is taken from the WHO Guidelines (The Irish Guidelines state >11.1 mmol/L).

Diabetes Mellitus

- A random (any time of the day without regard to time since last meal) venous plasma glucose concentration ≥ 11.1 mmol/l with symptoms of diabetes or
- A fasting plasma glucose concentration ≥ 7.0 mmol/l
- 2 hour plasma glucose concentration ≥ 11.1 mmol/l two hours after 75grms anhydrous glucose in an oral glucose tolerance test (OGTT).

Lesser Degrees of Glucose Tolerance

Impaired fasting glucose (IFG) – Fasting blood glucose between 5.6 and 6.9 mmol/l checked twice on separate days, (The WHO use 6.1 mmol/L instead of 5.6 mmol/L).

Impaired glucose tolerance (IGT) – A two hour plasma glucose between 7.8 and 11.0 mmol/l during OGTT.

A procedure for performing OGTT can be obtained from the Clinical Chemistry department.

Use of HbA1c as a diagnostic test for diabetes in adults

The WHO (2011) Diabetes Guidelines for the first time permits the use of HbA1c as a diagnostic test for diabetes in certain circumstances:

(www.who.int/diabetes/publications/diagnosis_diabetes2011/en/index.html).

Initial Testing Recommendation:

Initial testing in **non-pregnant adult patients suspected of having Type 2 diabetes** should now include a **Fasting Venous Plasma Glucose and concurrent HbA1c measurement**. Patient selection may be further refined by using a type 2 diabetes risk-assessment questionnaire such as:

FINDRISC (see: www.diabetes.fi/en/finnish_diabetes_association/dehko/publications)

Diagnosis

A: - Symptoms

When classic symptoms of hyperglycaemia are present, any **ONE** of the Laboratory measurements (**B**) is sufficient to establish the diagnosis (and usually the quoted thresholds are significantly exceeded).

In the absence of classic symptoms, **ANY TWO** of the Laboratory measurements (**B**) may be used to establish the diagnosis of diabetes.

B: - Laboratory Data Diagnostic Cut-points for diabetes (WHO-2011):

- **IFCC HbA1c \geq 48 mmol/L (6.5%) NEW**
- **Fasting Venous Plasma Glucose \geq 7.0 mmol/L**
- **Random Venous Plasma Glucose \geq 11.1 mmol/L**

A number of exclusions apply where HbA1c measurement is not suitable (see list) however in the vast majority of cases the diagnosis of diabetes can be established on the basis of plasma glucose measurements without recourse to Glucose Tolerance testing.

List of exclusions (do not rely on HbA1c testing for diagnosis)

- All children and young people
- Patients of any age suspected of having Type 1 diabetes
- Patients with symptoms of diabetes for less than 2 months
- Patients at high diabetes risk who are acutely ill (e.g. those requiring hospital admission)
- Patients taking medication that may cause rapid glucose rise e.g. steroids, antipsychotics
- Patients with acute pancreatic damage, including pancreatic surgery
- In pregnancy
- Presence of genetic, haematological and illness-related factors that influence HbA1c and its measurement (e.g known haemoglobinopathy, altered red cell survival).

See Guideline for comprehensive information.

8.6.1 Estimated Glomerular Filtration Rate (eGFR)

The Irish & UK guidelines on classification and monitoring of chronic kidney disease (CKD) recommend assessing renal function based on an estimated glomerular filtration rate, the eGFR. CKD has been classified in to 5 stages based on the patient's eGFR and other evidence of renal impairment such as proteinuria.

The Clinical Chemistry laboratory NGH calculates an eGFR for all creatinine requests received in the laboratory. This eGFR is based on the formula derived in the "Modification of Diet in Renal Disease" (MDRD) study. The MDRD formula is based on 4 variables: serum creatinine, age, gender and ethnicity. Serial measurements of eGFR are essential in assessing the severity of any renal condition. The eGFR has replaced the 24 hr creatinine clearance for many patients, see below.

eGFR underestimates normal or near normal glomerular function so results above 90 will be reported as >90 ml/min/1.73 m².

Table 8(k): Chronic Kidney Disease Classification

Stage	Description	
1	"Normal" GFR	eGFR >90 ml/min/1.73 m ² with other evidence of chronic kidney damage *
2	Mild impairment	eGFR 60- 89 ml/min/1.73m ² with other evidence of chronic kidney damage *
3	Moderate impairment	eGFR 30-59 ml/min/1.73 m ²
4	Severe impairment	eGFR 15-29 ml/min/1.73 m ²
5	Established Renal failure	eGFR <15 ml/min/1.73 m ² or on dialysis
<p>*The "other evidence of chronic kidney damage" maybe one of the following</p> <ul style="list-style-type: none"> • persistent microalbuminuria • persistent proteinuria • persistent haematuria (after exclusion of other causes e.g. Urological disease) • Structural abnormalities of the kidneys demonstrated on Ultrasound scanning or other radiological tests e.g. polycystic kidney disease, reflux nephropathy and/or Biopsy proven chronic glomerular nephritis <p>NB: without this other evidence, a GFR > 60 ml/min/1.73 m² does not indicate CKD</p>		

Facts about the MDRD eGFR:

- eGFR is reported in ml/min/1.73 m². Since the MDRD formula underestimates GFR in patients with normal or near normal kidney function eGFR of ≥ 90 ml/min/1.73 m² will be reported as >90 ml/min/1.73 m²
- eGFR is not valid in patients with rapidly changing renal function e.g. acute renal failure. Plasma creatinine should be monitored in these patients.
- The MDRD eGFR calculation was validated in Caucasian and Afro- Caribbean patients with renal disease in the USA.

Patients of Afro- Caribbean origin have a higher muscle mass so the eGFR should be multiplied by 1.21 for black patients. Although it has not been validated for all ethnic or population groups, the eGFR has been accepted for use in white and South Asian populations.

- MDRD eGFR has NOT been validated for calculating drug doses.
- Creatinine clearance with timed urine collections is still required for measuring GFR in certain circumstances
 - Extremes of body size and age e.g. severe malnutrition or obesity, elderly, children < 18 years
 - Pregnancy, Vegan diet, Creatine supplements
 - Skeletal muscle disease e.g. muscular dystrophy, paraplegia, quadriplegia, amputee
 - Prior to dosing with nephrotoxic / chemotherapy drugs
- Microalbuminuria is still the gold standard for detecting early renal disease in patients with diabetes mellitus
- eGFR formula varies slightly depending on the method used to analyse creatinine

8.6.2 Protein Creatinine Ratio

Protein Creatinine Ratio (PCR) is used for screening and monitoring of proteinuria. A random urine sample is the specimen required for this investigation. PCR is not affected by hydration status. PCR is reported as mg Protein / mmol Creatinine (mg/mmol). A 24 hour urine collection is no longer required for assessing renal protein excretion.

Interpretation of results should be based on the table below.

Table 8(I): Monitoring of proteinuria based on the UK CKD Guidelines.

PCR mg/mmol	UK CKD	Approx dipstick Equivalent	Comment
<15	Normal	Negative	Normal
15-44	“Trace” Protein	Trace	Trace proteinuria
45 – 100	Clinical Proteinuria (macroproteinuria)	1 +	Two or more PCR results > 45, in the absence of UTI, indicates proteinuria
>100	Clinical Proteinuria (macroproteinuria)	2+	Marked proteinuria Suggest referral to Nephrologist
≥450	Nephrotic Range proteinuria	3+	Nephrotic Syndrome Range Suggest urgent referral to Nephrologist

NB: Urinary Microalbumin measurement is still the gold standard for detecting early renal impairment in diabetic patients.

Table 8(m): Chronic Kidney Disease classification

Stage	eGFR mL/min/1.73 m ²	Associated Metabolic Disturbance	Interpretation	Minimum Frequency of monitoring renal function
1	> 90	Hypertension – more frequent than in patients without kidney disease	Normal eGFR Not CKD unless there is other evidence of chronic kidney damage e.g. <ul style="list-style-type: none"> • persistent microalbuminuria, proteinuria, and or haematuria (not urological) • radiological diagnosis • biopsy proven chronic glomerular nephritis 	Yearly if patient has evidence of CKD
2	60-89	In CKD patients <ul style="list-style-type: none"> • Hypertension • PTH starts to increase 	Mild impairment if there is other evidence of CKD (see above) Mild decrease in GFR is common in 30 % of healthy adults	Yearly if patient has evidence of CKD
3	30-59	<ul style="list-style-type: none"> • Hypertension is frequent • Calcium absorption and phosphate excretion decrease • PTH increases is more marked • Onset of malnutrition • Onset of anaemia (erythropoietin deficiency) • Onset of LVH 	Moderate impairment Treat complications Monitor progression Referral to a Nephrologist if <ul style="list-style-type: none"> • Condition progressive (more than 20 % deterioration in eGFR or plasma creatinine) • Microscopic haematuria present • Urinary Microalbumin : creatinine ratio > 3.5 or protein: creatinine ratio ≥ 45 • Unexplained anaemia • Abnormal K⁺, Ca⁺⁺ or phosphate. • Uncontrolled BP (>150/90) 	Yearly if stable 6 monthly if just diagnosed or progressive.
4	15 – 29	<ul style="list-style-type: none"> • As for stage 3 but more pronounced • Triglyceride levels rise • Risk of hyperkalaemia • Hyperphosphataemia • Metabolic Acidosis • Decreased libido 	Severe impairment Suggest referral to a Nephrologist	6 monthly if stable 3 monthly if just diagnosed or progressive
5	< 15	<ul style="list-style-type: none"> • As for stage 4 but more pronounced • Salt retention causing heart failure • Anorexia • Vomiting • Pruritis – without skin disease 	Established Renal failure (ERF) Suggest urgent referral to a Nephrologist	3 monthly

Classification of CKD proposed by the US Kidney Diseases Outcome Quality Initiative (K/DOQ1) group

8.7 Thyroid Function Tests – Procedure for Reflex Testing

There are two patterns of abnormal thyroid function tests depending on inclusion criteria in which the biochemistry laboratory may automatically carry out reflex testing:

(1) $fT4 \geq 26 \text{ pmol} & TSH > 0.3 \text{ mU/L}$

Normal or raised TSH and a raised free T4 value is a pattern of thyroid hormone results most often due to erratic thyroid replacement therapy or non-thyroidal illness. Rarely, this pattern can be due to resistance to thyroid hormone or TSH-oma. If the results do not fit with clinical status, presence of antibodies interfering with the assay on our platform (Roche e601) needs to be excluded and the sample will be referred for TFT analysis on an alternative platform (Abbott Architect).

A comment is appended to NGH TFT reports, '*Sample referred to TUH for TFT analysis on Abbott Architect.*'

A comment may be appended to TUH results providing advice and further management.

(2) $fT4 \leq 10 \text{ pmol/L} & TSH < 4.2 \text{ mU/L}$

Low or normal TSH and low free T4 test results can be due to non-thyroidal illness or use of medications. However, in the absence of a clear alternative diagnosis, central hypothyroidism should be considered and a full pituitary hormone profile is indicated.

NGH will automatically refer for partial anterior pituitary profile (tests that can be assayed on the remnant of the routine Li-Heparin plasma sample), unless it is known a patient is acutely unwell or other exclusion criteria apply (e.g. pregnancy, previously investigated).

A comment is appended to NGH TFT reports, '*Sample referred to TUH for partial anterior profile.*'

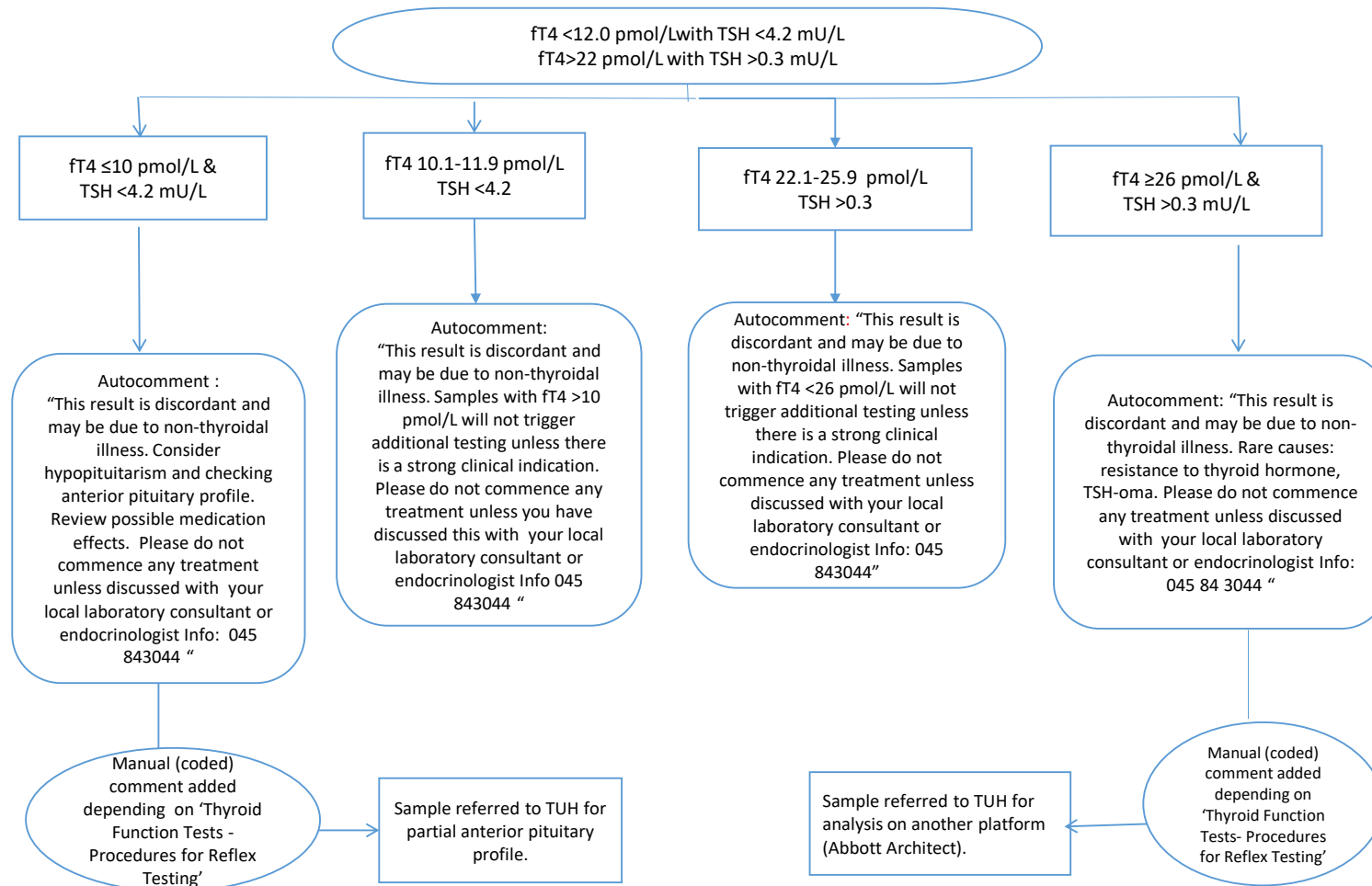
On review of automatic partial anterior profile results a comment may be appended to results providing advice and further management including a request for full anterior pituitary profile. "*PLEASE REQUEST FULL ANTERIOR PITUITARY PROFILE IN AM, FASTING*"

A full anterior pituitary profile includes: TFTs, cortisol, prolactin, FSH, LH, testosterone (male) or oestradiol (female), SHBG and IGF-1.

Specimen/Requesting requirements include 2x Lithium Heparin (Orange Top) and 2x Serum (White Top). Time of sampling is vital for interpretation of results. Samples must be received in the laboratory **within 4 hours**. Request should be marked for the attention of Chief Medical Scientist.

Results will be reviewed by Consultant Chemical Pathologist.

Thyroid Function Tests – procedure for reflex testing.



8.8 Interferences

Many tests are subject to interference. This may be due to biological/day-to-day variation, pre-analytical variation e.g. haemolysis, analytical variation e.g. specific method used and interactions with various drugs. The report may mention common interferences e.g. haemolysis, lipaemia and icterus. Some important Drug interferences are listed in the table below. This is not a complete list. Contact Clinical Chemistry for further information.

Table 8(n): List of tests and interferences

Test	Interfering Substance(s)	Details	Source
AST	Sulfasalazine/Sulfapyridine Cyanokit	Interference may lead to false results May cause interference with results	Method information sheet
ALT	Sulfasalazine/Sulfapyridine	Interference may lead to false results	Method information sheet
Urea	Sulfasalazine	Interference may lead to false results	HPRA safety notice: SN2019(31)
Glucose	Sulfasalazine	Interference may lead to false results	HPRA safety notice: SN2019(31)
LDH	Sulfasalazine	Interference may lead to false results	HPRA safety notice: SN2019(31)
Thyroxine	Sulfasalazine (High Dose)	Interference may lead to false results	HPRA safety notice: SN2019(31)
BILT	Cyanokit Indocyanine green Immunoglobulin	Interference may ↓ Results Samples must not be measured Possible interference in Bilirubin assay with Immunoglobulin concentration > 28g/L	Method information sheet Method information sheet CCFSN BILT3, SBN-CPS-2018-017
Creatinine (Enzymatic)	N-Acetyl Cysteine (>333 mg/L) Methyldopa Rifampicin Levodopa Dexium	Interference may ↓ results Interference may ↓ results Interference may ↓ results	Roche Safety Notice (CCFSN-03-15 May 2015) HPRA SN2015(09) 21/05/15 QN-CPS-2018-113 Method Information sheet
Lipids (Chol, Trig, HDL, cLDL)	N-Acetyl Cysteine	Interference may ↓ results	Roche Safety Notice (CCFSN-03-15 May 2015) HPRA SN2015(09) 21/05/15
Uric Acid	N-Acetyl Cysteine	Interference may ↓ results	Roche Safety Notice (CCFSN-03-15 May 2015) HPRA SN2015(09) 21/05/15
Immunoassays Cobas 6000	Biotin > 5mg/day <u>See Information Below</u>	Samples should not be taken until at least 8 hours following biotin administration.	Method information sheet

Potential for Biotin interference in Immunoassays

If patients are taking large doses of Biotin / Vitamin B7, there is known potential for significant interference in immunoassays for a number of commonly requested tests in Clinical Chemistry. This arises because biotin is involved in the assay design for many biomarker immunoassays.

Although normal diets, and low dose multivitamin preparations are thought not to interfere, in recent times, health food enthusiasts have been recommending people take large doses of Biotin for healthy hair, skin and nails, and supplements up to 10mg per tablet are available over the counter in many health food stores and online. There are also a couple of ongoing clinical trials of mega doses (up to 300mg/d) of Biotin in Multiple Sclerosis.

If you have a test result that does not fit the clinical picture, you may wish to exclude possible biotin interference as a cause, by asking the patient / parent / carer about any over the counter supplements or checking for a biotin Prescription.

Particular care should be taken in interpreting Troponin levels, where appreciable concentrations of biotin may cause a negative interference and is therefore potentially falsely reassuring. Clinicians caring for patients being investigated for chest pain /? AMI /? AGS should ask about biotin supplements for all patients when a Troponin level is requested.

1. **<5 mg supplements** are not thought to interfere
2. **5-10 mg supplements** are typical concentrations sold over the counter. Pharmacokinetic data extrapolation shows that these concentrations correspond to plasma concentrations of between 15.6-31.3 ng/ml.

While ALL immunoassay tests may be affected some of the most significant effects are summarised below.

The extent of the interference is dose and time related.

Table 8(o): Immunoassay tests that may be affected by Biotin

Test	Effect of 5-10 mg supplement
Troponin T	Inappropriately LOW result
TSH	Inappropriately LOW result
PSA	Inappropriately LOW result
FT4	Inappropriately HIGH result

3. **High-dose biotin (100 mg)** is sometimes used to treat metabolic diseases (isolated carboxylase defects and defects of biotin metabolism). A 100 mg biotin dose equates to 500 ng/mL plasma concentration. **This concentration leads to gross analyte disturbance across All Roche assays.**

Please contact the laboratory if you need further information on this.

9 NEAR PATIENT TESTING (NPT)

9.1 Introduction

A device for NPT is defined in the In-Vitro Diagnostic Device Regulation, 2022 (IVDR) as “any device that is not intended for self-testing but is intended to perform testing outside a laboratory environment, generally near to, or at the side of, the patient by a health professional”. NPT has replaced POCT as the preferred terminology in the EU’s IVDR regulation. NPT aims to improve patient outcomes using small analytical devices (such as test kits, single-use devices and analysers), provided near to the patient rather than from a central clinical laboratory.

With the increasing use of NPT, it is important that testing performed outside of a central laboratory is assured of the same quality and standards and does not represent a patient safety risk. NGH established a Point of Care Steering Committee in 2009 in accordance with the National Guidelines for safe and effective near - patient testing (NPT) 2021 <https://www.hse.ie/eng/about/who/cspd/ncps/pathology/resources/>.

This committee provides clinical governance for NPT services through the evaluation and approval of selected NPT devices within the hospital.

At NGH, a number of NPT devices and methodologies are located outside of the laboratory for which the laboratory currently provides maintenance, troubleshooting and training supports.

9.2 Blood Gas Analysis Service

Blood Gas Analysers – Radiometer ABL - 90 Flex, are currently located in ICU, CCU, ED, THEATRE and the LABORATORY and are monitored using connectivity to the AQUIRE remote monitoring system. The AQUIRE remote monitoring system software is located on PC’s in the Clinical Chemistry Laboratory Office and the Point of Care Management Team IT devices.

9.3 Reference Ranges – Arterial Blood Gas Adult Reference Ranges

Arterial Blood Gas	Reference Range	Units	Reference
pH	7.35-7.45		1
Hydrogen ion concentration	35.5 – 45.7	nmol/L	1
PCO2	4.67- 6.40 (m); 4.27-6.00 (f)	kPa	1
PO2	11.1-14.4	kPa	1
Na+	136 - 146	mmol/L	1
K+	3.4 – 4.9	mmol/L	1
Cl-	98 -106	mmol/L	1
Ca++	1.15- 1.29	mmol/L	1
Glucose	3.89 – 5.83	mmol/L	1
Lactate	0.5-1.6	mmol/L	1
Haemoglobin	13.5-17.5 (m); 12.0– 16.0 (f)	G/L	1
Oxygen Saturation	95-99	%	1
Carboxyhaemoglobin(as % Hb)	0.5-1.5	%	1

1. ABL 90 FLEX Reference Manual: Ext Reference POCT/ 005

9.4 Glucometer Service

The Roche AccuChek 11 glucometer devices are ward sited (2-3 per ward) and are monitored using connectivity to the COBAS[®] IT 1000 remote monitoring system. The remote monitoring system software is located on PCs in the Laboratory and the Point of Care Management Team IT devices.

9.5 INR Services – NPT Device

The Roche CoaguChek XS Pro2 INR devices (2) are located in the Anticoagulation Service clinic and monitored using the COBAS[®] IT 1000 remote monitoring system.

9.6 INR Services – Patient Self Testing Devices

Patients who are self-monitoring for INR are supplied with Roche CoaguChek XS or CoaguChek INRange – Patient Self Testing (PST) INR devices.

9.7 Password Protection

The ABL-90 Flex, CoaguChek XS Pro2 and the AccuChek 11 devices are password protected, restricting usage to trained users. The PST devices are not password protected.

All users are required to receive training and competency assessment which includes the authorisation of the NGH personal ID, Medical Registration Number or DOB to access equipment and perform analysis. Only trained staff should perform analysis and all users are personally accountable for any testing performed using their password. Training is organised as required. Please contact Ext. 9944 or Bleep 302 (Point of Care Management Team) to arrange training.

9.8 Support Hours

Routine hours: Urgent Blood Gas Analysis, Blood Gas Equipment, AccuChek II, CoaguChek queries: contact POCT Manager Ext. 9944, Bleep 302 or Ext. 3043

Non-Routine hours: Contact the On-Call Clinical Chemistry Medical Scientist.

The laboratory does not currently provide direct support for other NPT devices or testing other than those outlined above.

10 MICROBIOLOGY

The Microbiology Laboratory provides a 24/7, 365 days a year service. Routine hours are Monday to Friday 8am to 5pm. There is also a dedicated Micro service between 5pm-8pm weekdays and on weekends between 9am - 6pm. Microbiology can be contacted via extension 3039 Monday to Friday (8am to 8pm) only.

At all other times there is an Emergency/On Call Micro service available. Please contact Microbiology via switch 8pm to 8am on weekdays and at all times at weekends.

10.1 List of tests available outside of routine hours

10.1.1 Emergency/On-Call Microbiology Service (8pm to 8am weekdays

And all times at weekends unless specified below).

The emergency microbiology service includes the following

- All CSF samples.
- **Blood cultures** (loaded, monitored continuously and checked at regular intervals).
- Legionella/Pneumococcal urinary antigen - by Consultant Microbiologist request only.
- Emergency **antibiotic assays**, which cannot wait until the following morning - by Consultant Microbiologist request only.
- **Hepatitis B/C**: Acute pre-dialysis patients or needlestick injuries. Once approved by a Consultant at the requesting hospital the ward/clinician needs to contact the NVRL person On-Call. The NVRL on-call service can be accessed outside normal hours by contacting and leaving a concise message. Log on to nvrl.ucd.ie for up-to-date contact numbers.
- **Covid-19/Influenza testing** up to 22:00 every day for ED/ Symptomatic patients in wards, post mortem and LVU. Organ Donation BALs tested as required.
- **Joint Fluids from ED only**, processed up to 22:00 every day.

10.1.2 Dedicated Micro Service (5pm to 8pm weekdays) also Sat, Sun and Bank Holidays (9am to 6pm).

The dedicated micro service includes the tests stated in section 10.1.1 above **and** the following supplementary investigations

- Sterile Fluid Microscopy/Culture
- CPE culture (5pm cut off)
- All Sars CoV-2 and Influenza testing subject to daily capacity limit.
- C.diff testing- By Consultant Microbiologist request only.
- Genexpert CPE testing- Contact Nursing Admin or Consultant Microbiologist.
- Antibiotic assays- Gentamicin and Vancomycin- are processed in-house with a cut off time of 4pm - Consultant Microbiologist approval necessary outside this time.
- Legionella / Pneumococcal urinary antigen (Monday to Friday only, 8am to 7.30pm), from any ward with relevant clinical details. ICU and Liffey 1 + 2 will be tested regardless of clinical details. Out of Hours testing requires Consultant Microbiologist approval. It is the responsibility of the requesting Clinician to phone the Consultant Microbiologist and get approval.

10.2 Laboratory Notification of Emergency Work:

Within routine hours, please telephone the Microbiology Laboratory (Ext. 3038/3039) or Specimen Reception (Ext. 9911). This is essential to ensure that the sample is expected and is handled as an emergency test. Please note that marking a sample “Urgent” **will not** cause it to be handled urgently unless the Microbiology Laboratory has been informed. Any time at weekends and on weekdays (8pm to 8am only), please contact the Microbiology on-call scientist through Switch.

10.3 Transport of samples to the laboratory

The Pneumatic Tube/Chute System (PTS) **cannot** be used for sending the following samples: CSF

10.4 Storage

Should there be any delay in the transport of any sample to the Microbiology Laboratory the following storage conditions will be required:

Sample Type	Storage conditions
Blood samples/Mycology	Room temperature (RT°C)
Blood Cultures	Deliver to lab immediately
Urines/Faeces/Sputa/Fluids/Swabs	Refrigerate at 4°C
CSF samples	Deliver to lab immediately

10.5 Results reported by phone

All positive CSF results, all initial positive Blood Cultures, positive CRE screens, all positive Flu/Sars CoV-2 samples, any significant molecular respiratory result, all significant findings in faeces including C.diff toxin and Norovirus, and any Legionella or Pneumococcal antigen positive in urine are reported by phone. All other results will be available on the ward terminals.

10.6 Notifiable results

All notifiable findings within Naas Microbiology laboratory are detailed to the Infection Control team as well as informing the Health Protection Surveillance Centre (HPSC) via Computerised Infectious Disease Reporting (CIDR).

10.7 Susceptibility Testing

Susceptibility testing and reporting is carried out according to EUCAST (European Committee on Antimicrobial Susceptibility Testing) guidelines where appropriate. Therefore, some susceptibility results consist of a ‘guidance’ comment rather than actual S/I/R results.

10.8 Special requirements for Microbiology Sampling and Testing

Any sample type suspected of containing a highly infectious organism must be sealed correctly and hand delivered to the lab. Mark the request form clearly with clinical details and suspected organism/infection/disease name to notify all staff. The lab can be contacted in advance for guidance on processing.

For a full list of Biological agents refer to

https://www.hsa.ie/eng/publications_and_forms/publications/biological_agents/cop_biological_agents_2020.pdf

Please include all relevant clinical details on request forms. This is very helpful for the laboratory to ascertain which organisms are true infections or possible contaminants.

PLEASE NOTE: Turnaround times are based on routine specimens, are approximate and apply to working days only. Further days are also needed in case of positive cultures that consist of resistant or unusual organisms. In some cases, additional testing and / or referral may be required; this will also extend expected turnaround times.

10.9 Sample Types

10.9.1 Blood Cultures

Only take blood for culture when there is a clinical need to do so. Blood cultures are taken to identify patients with bacteraemia. For suspected Infective Endocarditis, three sets of optimally filled blood cultures should be taken from peripheral sites with ≥ 6 hrs between them prior to commencing antimicrobial therapy. Out of routine hours the Microbiology scientist should be phoned immediately prior to sending samples.

Due to the safety processes within the laboratory, all requesting clinicians must provide relevant information with each request so that laboratory staff are not exposed to dangerous pathogens e.g. high risk patient samples, exotic foreign travel.

Bottles:

The blood culture bottles and system in use are the BacT (Biomerieux) system. The bottles are available from the microbiology laboratory on request. Bottles should be kept at room temperature in the wards. The number of bottles stored in each ward should be limited to their general usage and excessive stocks avoided.

Ensure fluid is clear and sensor at the bottom of the bottle is grey. There is an expiry date on each bottle and they **should not be** used after this date.

Two routine bottles are available:-

A **blue (aerobic) top** and a **purple (anaerobic) top** bottle. A **red (Mycobacteria) top** bottle is available by special arrangement.

Sampling Method:

Please refer to Section 2.2 'Procedure for Phlebotomy and Primary Sample Collection' for sampling method.

Label each bottle with the patient's name, hospital number, DOB and date and time of collection. Please do not cover removable barcode label with the addressograph label.

Deliver the bottles in the bag attached to the Microbiology request form to specimen reception at any stage day or night immediately after taking.

Blood cultures should be loaded onto the BacT system within four hours from when the sample was taken. Blood Cultures are monitored continuously and processed 24 hours a day.

Time to Report: Most organisms (if present) will be detected within 24-48 hrs. Blood cultures are normally incubated for up to 5 days. Please contact the Microbiology Department to discuss if extended incubation time is required.

POSITIVE BLOOD CULTURES are notified to the ward involved as soon as possible following positive 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.

Positive Blood Cultures that meet particular requirements are analysed by the BioFire® PCR system.

The BioFire® PCR Blood Culture Identification panel tests for the following:

Gram Positive Bacteria:

Enterococcus, *Listeria monocytogenes*, *Staphylococcus aureus*, Non-*Staphylococcus aureus* species, *Streptococcus agalactiae* (Group B), *Streptococcus pneumoniae*, *Streptococcus pyogenes* (Group A), Non-*agalactiae/pneumoniae/pyogenes Streptococcus* species.

Gram Negative Bacteria:

Acinetobacter baumannii, *Enterobacter cloacae* complex, *Escherichia coli*, *Klebsiella oxytoca*, *Klebsiella pneumoniae*, *Proteus*, *Serratia marcescens*, presence of another unspecified *Enterobacteriaceae*, *Haemophilus influenzae*, *Neisseria meningitidis*, *Pseudomonas aeruginosa*

Yeast:

Candida albicans, *Candida glabrata*, *Candida krusei*, *Candida parapsilosis*, *Candida tropicalis*

10.9.2 Cerebrospinal Fluid (C.S.F.)

Samples should be transported to the lab as soon as possible. Out of routine hours the Microbiology scientist must be phoned immediately prior to delivering sample. **They should never be sent in the PTS (Pneumatic Tube System). They must be hand delivered to laboratory personnel to ensure prompt processing.**

Bacteraemia is sometimes seen associated with meningitis, and a blood culture should be taken when meningitis is suspected. If in doubt, the Consultant Microbiologist should be contacted for advice. Results are phoned to the ward as soon as they are available.

Specimen Required

CSF sample - as much sample as possible divided into:-

- a. Three Sterile universal container bottles sequentially marked I, II and III in order of collection.
- b. Send all specimens to Microbiology for microscopy, culture and sensitivity or any additional tests e.g. oligoclonal bands, virology, cytology, mycobacteria.
- c. A specimen will be analysed in Clinical Chemistry for CSF glucose and protein.
- d. Send a blood glucose sample (to compare with CSF glucose value).
- e. Send blood culture as outlined in section 10.9.1.
- f. Send EDTA blood sample for PCR for meningococcus if this is suspected.
- g. **Send a serum sample for oligoclonal bands** if this is required (CSF will not be processed for oligoclonal bands if no serum is received)

- h. Send sample in polypropylene collection tubes (available from micro if required, prior to taking sample) if Neurodegenerative markers required.
- i. The Consultant Microbiologist decides what tests are to be performed on white cell positive (>6) CSF samples.

Normal CSF Findings:

White Cell Count:	0 - 6 / c.m.m.
Protein:	15 - 45 mg/dL
Glucose:	3 - 5 mmol/L or approx. 60-75% of plasma glucose.

All white cell positive (>6) CSFs will be analysed by BioFire® PCR. The BioFire® PCR Meningitis/Encephalitis panel tests for the following:

Bacteria: *Escherichia coli K1*, *Haemophilus influenza*, *Listeria monocytogenes*, *Neisseria meningitides*, *Streptococcus agalactiae*, *Streptococcus pneumonia*.

Viruses: Cytomegalovirus, Enterovirus, Herpes simplex virus 1, Herpes simplex virus 2, Human herpesvirus 6, Human parechovirus, Varicella zoster virus.

Yeast: *Cryptococcus neoformans/gattii*.

Viral Meningitis

If clinical and laboratory findings suggest viral meningitis and a negative Biofire result is obtained, a faeces sample and throat swab should be sent for virus culture and a serum sample for HSV, VZV, Mumps, Measles, EBV and Enterovirus IgM. If Mumps is suspected or clinical details suggest it, a CSF sample should also be sent to NVRL for Mumps PCR.

10.9.3 Fluids from sites normally sterile

Specimens should be transported to the lab and processed as soon as possible. Large volumes of purulent material maintain the viability of anaerobes for longer. The recovery of anaerobes is compromised if the transport time exceeds 3 hours. If processing is delayed, refrigeration is preferable to storage at ambient temperature. Delays of over 48 hours are undesirable

Specimen required

A good representative sample for **culture** in a sterile universal container.

Normal Findings:

Peritoneal / Ascitic Fluid	White Cell Count:	0 - 200 /cmm
Synovial / Joint Fluid	White Cell Count:	0 - 200 /cmm

10.9.4 Sputum Culture/Bronchio-Alveolar Lavage/Bronchial Washings/ Antral Washout

Specimen Required

A good quality sputum sample should be submitted, ideally from the lower respiratory tract expectorated by deep coughing.

Salivary, muco-salivary or postnasal secretion samples may give misleading results as these samples will be contaminated by normal mouth flora.

Sputum and Antral washout are cultured for all likely Lower Respiratory Tract (LRT) pathogens. The laboratory should receive a minimum volume of 1 ml in a sterile universal container.

Broncho-Alveolar Lavage (BAL) is routinely cultured for bacterial pathogens and is referred to Tallaght for TB culture. The sample will also be referred if other tests are indicated e.g. Cytology, Legionella PCR, CMV, other viruses and Pneumocystis.

BAL samples from ICU/BALs that have clinical details of pneumonia will be referred for Legionella PCR. BAL with? fungal /? aspergillus request will be referred for Galactomannan. BAL with cell count / eosinophils request will be referred to Haematology, TUH.

Sputum may be refrigerated for up to 2-3 hours without appreciable loss of pathogens

To take sample: Gargle and rinse mouth with tap water to remove food particles and debris. DO NOT use mouthwash or brush teeth with toothpaste immediately before collection. Open the container and hold very close to mouth.

Take as deep a breath as possible and cough deeply from within the chest. DO NOT spit saliva into the container. The specimen should look thick and be yellow or green in colour. There may be fluid with some green or yellow material.

Avoid contaminating the outside of the container. Close the lid tightly when specimen has been obtained. Make sure the specimen and form are correctly labelled. Place specimen in plastic bag section of request form and seal bag.

Bring the container and form to your GP or the laboratory as soon as possible.

If there is unavoidable delay in transporting the specimen to the GP or Laboratory, it may be stored in a refrigerator prior to transportation. Prolonged delays will affect test results.

All sputum samples should be transported to the laboratory in tightly capped containers placed in the plastic bag (attached to the form).

This should ideally then be placed in another leak-proof container before transport to the laboratory.

Wash and dry hands thoroughly with soap and warm water.

When requesting microbiology testing on sputa samples, it is important to inform the microbiology laboratory, NGH (*via clinical details section of the request form*) if patient has TB or is *clinically suspected of having TB*. Because of the safety issue, these samples must be processed in category 3 containment level as Mycobacterium ('TB') is a Hazard Group 3 organism. As the Microbiology Department NGH does not have sufficient containment level, we would therefore send these specimens and specimens from CF patients to Microbiology, Tallaght Hospital for processing.

When requesting tests on bronchial washing specimens, if possible, please provide five spare **addressographs to accompany each specimen bottle sampled.**

This will assist with sample management in the Microbiology laboratory, as these samples need to be split for further testing at other laboratories. A further reminder is to provide **correct forms for each test requested:**

- Routine c/s requests require a NGH microbiology (yellow) form,
- ZN/TBC requests require a Tallaght microbiology (white) form,
- Histology/cytology requests require a Tallaght histology (blue) form.

10.9.5 Eye Swabs

For investigation of **conjunctivitis** a swab should be taken as follows:-

Retract the lower eye lid and stroke the tarsal conjunctiva with a transport swab and remove all purulent material. Place swab in transport medium and replace cap.

If chlamydial infection is suspected, please contact the micro laboratory or NVRL beforehand to obtain chlamydial transport swab. Break the swab into this medium and replace cap. Send swabs to the laboratory immediately.

10.9.6 Throat Swab

Using a tongue depressor take a vigorous swab sample from the tonsil or inflamed area. Replace the swab in the transport medium and close cap.

10.9.7 Nasal Swab

A nasal swab is not usually useful for the investigation of sinusitis.

Antral lavage or pus from sinus should be sent if acute maxillary sinusitis is suspected.

Nasal swabs are useful for the investigation of carriage of Staphylococcus, including MRSA. Please indicate whether culture or MRSA screening is required.

Specimen required

Rotate one swab twice round each of the anterior nares.

10.9.8 Genital Infections

Sexually Transmitted Diseases

Specimens Required: Females: Cervical or High vaginal swabs, Urethral swabs

Males: Urethral swab, Penile swab

Genital tract swabs

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*, the posterior fornix, including any obvious candidal plaques should be swabbed. If pelvic infection is suspected, the cervical os should be swabbed.

If gonorrhoea is suspected this is now tested in conjunction with Chlamydia on a special APTIMA device kit available from the NVRL- refer to www.nvrl.ucd.ie

These kits are for use with non-blood samples.

High vaginal swabs

After the introduction of the speculum, the swab should be rolled firmly over the surface of the vaginal vault. The swab should then be placed in transport medium, preferably with charcoal.

Cervical swabs

After introduction of the speculum into the vagina, the swab should be rotated inside the endocervix. The swab should then be placed in transport medium preferably with charcoal.

Urethral swabs

Contamination with micro-organisms from the vulva or the foreskin should be avoided. Thin swabs are available for collection of specimens.

The patient should not have passed urine for at least 1 hour. For males, the swab is gently passed through the urethral meatus and rotated. Place the swab in transport medium, preferably with charcoal.

Intrauterine contraceptive devices (IUCDs)

The entire device should be sent in a sterile universal container.

Rectal swabs

Rectal swabs should be taken via a proctoscope.

?PID (Pelvic Inflammatory Disease): The preferred specimens for diagnosis of PID (endometritis, salpingitis, pelvic peritonitis or a combination of these) are aspirates collected from a fallopian tube, Tubo-ovarian abscess (TOA), Pouch of Douglas (POD), Bartholins gland or peritoneal fluid. Please include all relevant clinical details.

Transport all swabs immediately to the laboratory.

If Chlamydia or Gonorrhoeae or Trichomonas infection is suspected, a Chlamydial/Gonococcal unisex APTIMA collection device or urine APTIMA collection device is required. These are available from the NVRL- refer to www.nvrl.ucd.ie

If Herpes simplex infection is suspected, a viral transport swab (VTM) is required. The VTM swabs are supplied to external locations from the Microbiology Department. NGH wards or OPD order VTM swabs from Stores department: 045 849940

10.9.9 Pus Samples/Wound Swabs/ Cannulae/Tissue+Biopsie specimens

Wound swabs should only be taken when signs of clinical infection are present. A swab can be taken from any site with signs of infection. Deep swabs rather than superficial will give more accurate representation of bacteria/ fungi present which may be causing infection.

A biopsy is a portion of tissue removed from the body for further examination. With the increasing sophistication of clinical imaging and sampling devices there are few organs in the human body that cannot be biopsied. Tissue obtained at operation is particularly precious as the sampling procedure may not be repeatable. Ideally these specimens should be discussed with the laboratory prior to sampling to ensure that transport and processing are timely and appropriate tests are performed.

If viral infection is suspected please refer to section 10.9.18.

Please indicate clearly on the request form, and the swab, the site of the wound and any relevant patient clinical details, otherwise interpretation of culture results are more difficult.

Specimens required:

1. **Pus** sample (always preferable to a wound or pus swab) in sterile universal container.

2. **Wound swab** in transport medium. (Please note on form the site of the wound **and** any relevant clinical details).
Wound or Pus samples are screened for all likely bacterial pathogens and, if present, these organisms and their antibiotic sensitivity results are reported. The inclusion of relevant clinical information on the request form assists in deciding the relevance of some bacterial isolates.
3. **Cannulae** – line tips, e.g. CVP or Hickman lines to be received in sterile leak proof container and ideally a minimum length of 4cm.
Swabs of cannula insertion sites to be transported in Amies transport medium with/without charcoal.
Please note Urinary Catheters are unsuitable for processing.
4. **Tissue/Biopsy specimens** - in sterile universal container.

10.9.10 Urine

A clean mid-stream specimen is essential. In urinary tract infections (UTI) the bacterial count exceeds 100,000 organisms/ml in the majority of cases.

Urine acts as a culture medium and therefore specimens should be stored at 4°C to prevent subsequent multiplication of bacteria after collection of the patient sample which would invalidate the bacterial count. **Any sample which may be subject to delay of more than 2 hrs before being sent to the lab should be refrigerated.** Make sure lid is tightly closed to prevent leakage of sample. Leaking samples will not be processed. Please do not overfill the container. A half-full container is sufficient for routine microbiological investigations. It is important that the type of specimen is clearly indicated to guide interpretation of results.

- **Specimens Required:**

- **MSU (Mid-Stream Urine):**

A mid-stream urine is the recommended sample and requires careful collection into an empty sterile universal container free from preservatives.

To take specimen:

The container should not be opened until you are ready to collect the sample.

Prior to collection the genital area should be cleaned with tap water. Antiseptics should not be used. If the area is soiled, use soap and water and rinse thoroughly.

Pass some urine into the toilet (or discard the initial part of the urine sample); then without stopping the flow of urine, catch some urine in the sterile container (approximately half full). You should then finish passing urine into the toilet.

Ensure that the lid of the container is firmly closed and place the container into the specimen bag attached to the laboratory request form. Specimens should ideally be brought to the doctor's surgery or laboratory within 2 hours of collection. If that is not possible the sample should be refrigerated until it can.

Wash and dry hands thoroughly with soap and warm water.

- **CSU (Catheter Specimen Urine):**

Samples may be from patients who have had a catheter inserted for a one-off urine sample or those who have in-dwelling catheters. The specimen should not be collected from the specimen bag. In patients with a long term indwelling catheter, samples should only be sent if clinically indicated i.e. patient symptomatic or systemically unwell or having a catheter change or urinary tract instrumentation.

BSU (Bag Specimen of Urine):

This is commonly used for infants. A sterile collection bag is applied to the cleansed perineum to catch urine, which must then be drained into a sterile universal container. Culture results are difficult to interpret as contamination is common with this method of specimen collection.

Cytoscopy:

Urine is obtained directly from the bladder using a cystoscope.

- **Tests available:**

1. Microscopy:

White cell count: Normal range 0-10 / cmm

Red cell count: Normally absent

Comment on the presence of epithelial cells, crystals, yeast etc. If casts are suspected please indicate as further processing is necessary. A fresh specimen is essential for casts.

2. Bacterial Colony Count:

Should be less than 1,000 orgs/ml ($<10^3$ orgs/ml)

1,000 - 100,000 orgs/mL may indicate UTI.

$>100,000$ orgs/ml (10^5 orgs/ml) is usually indicative of UTI. All bacterial pathogens, if present, are reported with antibiotic sensitivity results.

Urine cell counts and urine bacterial colony counts are based on *UK Standards for Microbiology Investigations / issued by Standards Unit, Public health England.*

3. Legionella/Pneumococcal Urinary Antigen:

This is available on urine samples if relevant clinical details are provided. ICU and Liffey 1+2 samples will be processed even if no clinical details provided. From all other locations, if there are no clinical details, requesting clinician can contact Microbiology laboratory to discuss if the sample will be tested.

Pneumococcal antigen kit

- A negative Pneumococcal antigen test does not exclude infection with *S.pneumoniae*, therefore the results should be used in conjunction with other tests such as culture and serology and clinical findings to make an accurate diagnosis.
- The test has not been evaluated on patients taking antibiotics for >24 hours or on patients who have recently completed antibiotics.
- The *S.pneumoniae* vaccine may cause a false positive reaction in the 48 hours following vaccination. It is recommended the antigen test should not be used within 5 days of vaccination.
- The accuracy of this antigen test in urine has not been proven for young children.

Legionella antigen kit

- The *Legionella* antigen test detects *Legionella pneumophila* serogroup 1 antigen only.

- The *Legionella* antigen test will not detect infections caused by other *L.pneumophila* serogroups and by other *Legionella* species. A negative antigen test does not exclude infection with *L.pneumophila* serogroup 1. Culture is recommended for suspected pneumonia to detect causative agents other than *L.pneumophila* serogroup 1 and to recover serogroup 1 when the antigen is not detected in urine.
- There is no single satisfactory laboratory test for Legionnaires' disease. Culture results, serology and clinical findings should all be used for an accurate diagnosis.
- Excretion of *Legionella* antigen in urine may vary depending on the individual patient. Antigen excretion may begin as early as 3 days after onset of symptoms and persist for up to 1 year afterwards.
- A positive *Legionella* test result can occur due to current or past infection and therefore is not definitive for infection without other supporting evidence.
- The *Legionella antigen* test has been evaluated on hospitalised patients only. An outpatient population has not been tested.

10.9.11 Faeces

Faeces samples are examined for the identification of the causative organisms of diarrhoea. A wide range of bacterial pathogens, viruses and parasites are capable of causing diarrhoea by a number of mechanisms. Specimens should be collected in a sterile leak-proof container as soon as possible after onset of symptoms and transported to the laboratory and processed. Samples received out of hours are refrigerated until next routine day.

- Please note: **Faecal Occult Blood**- No longer tested in Microbiology. In-house testing performed at ward level only. Kits are available from Pharmacy.

Specimen Required:

Faecal specimen in a sterile leak-proof container. Separate samples required if multiple tests requested.

The Faeces examinations available for each type of patient are listed below:

1-ED Patients:

- ED Faecal samples are tested by PCR methods:

SEEGENE Allplex™ GI-EB PCR assay: This Molecular assay can detect the presence of *Yersinia enterocolitica*, *Shigella spp.* / *EIEC*, *E.coli 0157*, *C. difficile*, *stx1/stx2* (Shiga toxin genes), *Salmonella spp.* and *Campylobacter spp.*

Or

BioFire® PCR by special request: an extended panel available for parasites and viruses with prior approval by Consultant Microbiologist. This Molecular assay can detect the following:

Bacteria: *Campylobacter*, *Clostridium difficile* toxin A/B, *Plesiomonas shigelloides*, *Salmonella*, *Vibrio*, *Yersinia enterocolitica*.

Diarrhoeagenic E.coli/Shigella: Enteroaggregative *E.coli* (EAEC), Enteropathogenic *E.coli* (EPEC), Enterotoxigenic *E.coli* (ETEC), Shiga-like toxin-producing *E.coli* (STEC(VTEC)) *stx1/stx2*, *E.coli 0157*, *Shigella*, Enteroinvasive *E.coli* (EIEC)

Parasites: *Cryptosporidium*, *Cyclospora cayetanensis*, *Entamoeba histolytic*, *Giardia lamblia*

Viruses: Adenovirus F40/41, Astrovirus, Norovirus GI/GII, Rotavirus A, Sapovirus.

Relevant clinical details and history of foreign travel may help in the diagnosis of more uncommon pathogens including Vibrio, Yersinia etc.

Other tests that can be performed on ED samples

- **Norovirus.**
- **Viral Studies.**
- **Ova and parasites**-see section 10.9.14 below.
- **CPE/CRE, ESBL/VRE.**

2-In-House patients:

- Routine Faeces Analysis is not performed on hospital in-patients. Clinician must contact Microbiology lab if testing is required on ward samples.
- ***Clostridium difficile* toxin.**
- **Norovirus.**
- **Viral Studies.**
- **Ova and parasites**-see section 10.9.14 below.
- **CPE/CRE, ESBL/VRE**

3-External Patients: (GP/Nursing homes etc.)

- Faecal samples are tested by PCR methods:
SEEGENE Allplex™ GI-EB Screening PCR assay: This Molecular assay can detect the presence of *Yersinia enterocolitica*, *Shigella spp.* /EIEC, *E.coli* 0157, *C. difficile*, *stx1/stx2* (Shiga toxin genes), *Salmonella spp* and *Campylobacter spp.*
- Contact Consultant Microbiologist if Enteropathogenic E.coli (EPEC) is required for children under 3 years. (performed by special request on BioFire® PCR)
- Parasitology-ensure appropriate clinical details and sample will be referred to Biominis, see section 10.9.14 below.
- ***Clostridium difficile* toxin.**
- **Norovirus.**
- **Viral Studies.**
- **Rotavirus** on children under 3 years.
- **Ova and parasites**-see section 10.9.14 below.
- **CPE/CRE, ESBL/VRE.**

Relevant clinical details and history of foreign travel may help in the diagnosis of more uncommon pathogens including Vibrio, Yersinia etc.

10.9.12 Antibiotic Assays

Gentamicin and Vancomycin

Within routine hours, please telephone the Microbiology Laboratory (Ext. 3038/3039) or Specimen Reception (Ext. 9911) if a sample is urgent. This is essential to ensure that the sample is expected and is handled as an emergency test. Please note that marking a sample “Urgent” **will not** cause it to be handled urgently unless the Microbiology Laboratory has been informed. Any time at weekends and on weekdays (8pm to 8am only), please contact the Microbiology laboratory on-call scientist through Switch.

Trough levels should be taken immediately prior to the administration of the next dose. **Trough** details of dose and timing should be recorded on the request form and samples. **Peak** levels (taken 1 hour post administration of antibiotic dose) are no longer processed as they are of limited clinical utility. **Random levels are difficult to interpret and are not recommended.** If taken to determine whether another dose should be given they should be considered and labelled trough levels and the time from last dose recorded on the request form

Amikacin and Tobramycin

Serum samples (light brown cap) for Amikacin and Tobramycin are processed in the Microbiology Department at Tallaght Hospital.

10.9.13 Screening Methods

- **CPE/CRE, ESBL, VRE, MRSA**

Patients may be screened for the presence of CPE (Carbapenemase Producing Enterobacteriaceae), ESBL (Extended spectrum beta lactamase), VRE (Vancomycin resistant Enterococci) and MRSA (Methicillin resistant Staphylococcus aureus).

- **CPE/CRE Screening:**

ALL CPE (CRE) requests from any ward will be tested using **culture** method.

There is also a **molecular** testing service for **urgent** CPE (CRE) requests available at NGH Microbiology. It is subject to strict requesting criteria. This molecular service will only be available for samples fulfilling criteria below.

Molecular CPE (CRE) test will occur (Mon-Fri and Sat/Sun/Bank Holidays 9am-6pm) if:

- Appropriate sample has arrived in Lab Reception before 15:30 **AND** Microbiology dept. has received approval *directly* from Consultant Microbiologist, Nursing Admin or Infection Control. It is **not** sufficient to write Molecular test/Gene Expert on form as it will not be done without prior approval.
- Appropriate sample has arrived in Lab Reception after 15:30 (and cannot wait till next working day) **AND** Microbiology dept. has received approval *directly* from Consultant Microbiologist or Infection Control.

Specimens required:

1. Rectal/Faecal screen swabs for CPE (CRE) should be taken using a red double swab which can be ordered directly from stores (COPAN Transystem sterile transport double swab). ESBL and VRE testing can also be performed on this one swab. Carefully insert both swab tips approximately 1cm beyond the anal sphincter and rotate gently. Place the swabs back in the tube and close lid tightly. Specimens that cannot be tested within 6 hours should be refrigerated.
2. Faeces sample in sterile universal container.

- **ESBL/VRE Screening:**

Patients may be screened for the presence of ESBL (Extended Spectrum B-Lactamase organisms) or VRE (Vancomycin Resistant Enterococci). VRE screens are performed weekly on all ICU patients. Screening for all other wards only performed with prior approval by Consultant Microbiologist.

- **MRSA Screening:**

Staff and/or patient screens for colonisation by Methicillin-Resistant Staph aureus (MRSA) are necessary from time to time in the control of infection with this organism. The Consultant Microbiologist and the Infection Control Clinical Nurse Manager will initiate and monitor this screening as deemed necessary.

A full MRSA screen consists of:-

- Nasal Swab:** Rotate **one** swab twice round each of the anterior nares.
- Groin Swab:** Use **one** swab for both groins.
- Throat Swab:** Rotate swab on back of throat.

Please indicate whether routine culture or just MRSA screening is required.

Axilla swabs are not routinely tested for MRSA.

If present, also consider wounds, sites of damaged or abnormal skin, intravenous line insertion sites, catheter urine samples, and sputum if expectorating.

10.9.14 Ova Cysts & Parasites

Parasitology is available for cases with a convincing history including foreign travel and/or diarrhoea for longer than 14 days. These clinical details **MUST** be stated on the request form or the sample may not be processed. In addition the word 'Parasitology' must be specified, the word **microscopy does not** warrant parasitology investigation.

Specimens Required:

Faeces: A faeces sample is the sample of choice for most ova and parasite analysis.

Urine: A urine sample is required for the isolation of *Schistosoma haematobium* (Bilharziasis).

Sellotape Slides: Diagnosis of "Pinworm" (*Enterobius vermicularis*) infestation in children may also be made using the sellotape slide technique. Apply a piece of sellotape to the anal margin at night (the female worm crawls out of the anus at night and lays eggs in the anal margin). Then remove the sellotape and attach it to a glass slide, which is sent to the laboratory. Please label the slides with the patient's name, date of birth and hospital number if applicable.

10.9.15 Mycobacteria tuberculosis (TB) staining & culture (ZN & AFB culture)

Specimens Required

Sputum / Urine (EMU): Three early morning specimens

Pus: As much pus as possible

Other Body Fluids: As available

Bronchial washings: As available

Please note 'Swab' samples are not useful for the demonstration or isolation of mycobacteria. Fluid or tissue samples should be sent.

Please note that whilst the demonstration of acid-fast bacilli in smears is diagnostic, many samples have few bacilli and are smear negative.

It is important to inform the Microbiology laboratory, NGH (*via clinical details section of the request form*) if a patient has TB or is *clinically suspected of having TB*. Because of the safety

issue, these samples must be processed in Category 3 containment level, because Mycobacterium ('TB') is a Hazard Group 3 organism. As the Microbiology laboratory NGH does not have sufficient containment level, these specimens are sent to Microbiology, Tallaght Hospital for processing.

10.9.16 Mycology (Fungal) Examination & Culture

Systemic Fungal Infections

The isolation of fungi from blood and deep tissue is difficult. If systemic fungal disease is suspected please contact the Laboratory or the Consultant Microbiologist to discuss the case and ensure that fungal culture is specifically requested on the request form.

Superficial/ Skin Fungal Infections

Specimens Required: Skin, Hair and/ or Nails

Taking of Specimens:

1. Preliminary cleansing of the lesion with 70% alcohol reduces bacterial contamination.
2. Scales of skin are scraped with a scalpel or the side of a microscope slide from the active periphery of the inflamed area. Infected nails should be clipped off for examination and scrapings taken from deeper areas of the nail bed. Infected hairs must be carefully chosen to avoid submitting healthy hair.
3. All samples should be sent to the laboratory in a sterile universal container or commercially prepared package such as "Dermapak".

Swabs are tested routinely on-site for all ED, LVU, Mortuary and In- Patients. There is a Molecular test available in the Microbiology laboratory during routine hours Monday to Friday and also at weekends. A specific nasopharyngeal/oropharyngeal swab is required (obtained from stores). All external and staff swabs are sent externally for testing.

10.9.17 Coronavirus (SARS CoV-2) (COVID19)/InfluenzaA+B/RSV

(Respiratory Syncytial Virus) Testing

Specimens Required



- There are two types of Viral Transport Media (VTM) swabs that are suitable for molecular testing on the GeneXpert and Biofire analysers, these can be obtained from stores.

- Please note the pink topped container and swab come separately and the green is a single unit.
- An Oronasopharyngeal sample is obtained by taking a sweep of the oropharyngeal area first and then using the same swab to sample the nasopharynx.
- Place the swab into the tube and break the top of the swab off the side of the tube.
- Check the cap of the tube is shut and ensure tightly closed.
- Please place the sample in a biohazard bag.
- Samples should be hand delivered to the lab or sent in chute system.
- If the patient is producing sputum this can be tested for COVID-19.

Genexpert Targets include: SARS-CoV-2 and Influenza A, Influenza B and RSV (Respiratory Syncytial Virus).

Samples can be tested (by specific Consultant Microbiologist request only) on the **BioFire®** platform that has both viral and bacterial targets.

BioFire® Viral Targets include: SARS-CoV-2, Influenza A, Influenza B, RSV, Adenovirus, Coronavirus 229E+HKU1+NL63+OC43, Human Metapneumovirus, Human Rhinovirus/Enterovirus, Parainfluenzae virus 1-4, and MERS-CoV-2.

BioFire® Bacterial Targets include: *Bordetella pertussis+parapertussis*, *Chlamydia pneumonia*, *Mycoplasma pneumonia*.

Alternatively, the **SEEGENE Allplex™ SARS-Cov-2/FluA/FluB/RSV PCR assay Targets include:** SARS-CoV-2, Influenza A, Influenza B, RSV.

Depending on testing platform used (GeneXpert, Biofire or SEEGENE) the Viral targets reported vary. **Any positive result will be notified to Infection Control/Nursing Admin/Patients Team.**

10.9.18 Virology/Serology Investigation

Comments and requesting guide:

Please discuss with the Consultant Microbiologist if tropical or obscure infection is suspected. If viral infection is suspected in immuno-compromised patients, please contact the Consultant Microbiologist for advice. All external virology samples are referred to the National Virus Reference Lab (NVRL) for testing. All internal virology samples are referred to the NVRL except Covid 19, Influenza, RSV and Norovirus screens. These samples are tested in the Microbiology Lab.

ATYPICAL PNEUMONIAE SCREEN (APS)

If a patient presents with an atypical pneumonia infection, the following organisms should be considered:

1. Chlamydia pneumoniae

ELISA tests for IgM antibodies that appear within 2 to 4 weeks of onset of illness.

2. Legionella pneumophila

In an acute setting, please send urine for Urinary Legionella antigen. This test is useful in the early detection of Legionnaires disease. ELISA screening for IgG and IgM antibodies for sub groups 1 to 6 is performed on serum. Antibodies appear 2 to 4 weeks after onset of illness.

3. Coxiella burnetii

ELISA test for IgM, IgG and IgA, antibodies that appear within 2 - 4 weeks of onset of illness.

4. Mycoplasma pneumoniae

This is an EIA test for the detection of IgM antibodies. IgM antibodies usually appear 10 days after onset of illness. This test is only available on patients < 20 years of age and is performed in the NVRL.

5. Influenzae A and B

For Naas Hospital patients please see testing criteria in section 10.9.17 above.

External samples are processed in the NVRL. Please send a combined nasal and throat viral swab or a nasopharyngeal aspirate. For more information on NVRL testing please see section on Requesting Guide below.

SEROLOGY:

General Notes: Serological Tests

For a serological diagnosis, i.e. antibody tests based on appearance of IgG, acute (as early as possible in the illness) and convalescent sera (2-3 weeks after on-set) should be taken for antibody titration. A four-fold rise in titre is considered significant. Single samples for serology are of limited value unless used for detection of IgM antibody when such tests are available.

VIROLOGY:

General notes: Virus Isolation

Where virus isolation is attempted, specimens must be taken early in the illness in the correct manner. Please contact Consultant Microbiologist if there are any queries.

Requesting Guide

The "Requesting Guide" on Page 74/75 may assist in identifying possible agents with certain clinical syndromes. This guide is previously derived from guidelines issued by the NVRL, Dublin. For current and extensive guidelines and up to date contact phone numbers please refer to NVRL website <https://nvrl.ucd.ie> Requests for Viral screen, routine virology or atypical screen without accompanying clinical information will not be processed. Failure to supply the required information will lead to delays in reporting.

The NVRL provides a clinical liaison service to users, the role of which is to advise on the appropriate investigations for, and management of, specific viral infections. The clinical liaison service is provided by the clinical team within the NVRL and is available both during regular working hours and out-of-hours (details in the NVRL User Manual).

Where a sample requires urgent processing during routine hours the NVRL are contactable through the result line and nvrl.admin@healthmail.ie to notify of any urgents to be logged on the urgent tracking system at NVRL. Please provide patient name/ DOB and a contact number for results to be communicated in e-mail. Please also give dispatch date/time and delivery docket number.

An “out of hours service” is provided by the NVRL for urgent laboratory investigations. Please note that to ensure continuity of patient care the Consultant Microbiologist/ Pathologist at the requesting hospital should be involved in the decision to request out of hours testing. The on-call service can be accessed outside normal hours by contacting VoxPro Telephone call back service and leaving a concise message. Log on to <https://nvrl.ucd.ie> for up-to-date contact numbers.

The NVRL On-Call Clinical Team must also approve any request for investigation (as not all tests are available out of hours). The on-call service can be accessed outside normal hours by contacting 01 7164050. When using this number, the following information is required:

- a) Name of caller
- b) Contact number
- c) Hospital source
- d) Message

N.B. Results will be telephoned to the requesting doctor. To ensure prompt communication of results, it is ESSENTIAL that the request form accompanying the specimen specifies the requesting doctor's name and contact number (mobile number if possible).

Please see below example of what is classified as URGENT requests

Urgent Samples

Source of a needlestick injury/Blood Borne Virus exposure	Organ Donor	Unbooked patient in labour or who has just delivered her baby
Patient requiring serology for sperm banking/HARI unit	Pregnant lady in contact with Varicella Zoster / Immunosuppressed Patients for urgent VZV IgG	Urgent requests documented on Urgent Tracking System

TESTS TO BE ORDERED	
Provisional Diagnosis/ Symptoms	Possible Virus/ Agent/ Disease
AIDS & HIV	Human Immunodeficiency Virus (HIV)
Arthralgia	Rubella virus Parvovirus B19 Mycoplasma pneumoniae
Central Nervous System	Enterovirus Mumps virus Herpes simplex virus (HSV) Varicella zoster virus (VZV) Measles Dengue (if risk factors)
Conjunctivitis	Adenovirus Herpes Simplex virus (HSV) Enteroviruses Chlamydia trachomatis
Hand, foot & mouth disease	Coxsackie A16 virus
Diarrhoea/Vomiting	Rotavirus Adenovirus Astrovirus Calicivirus Norovirus (mall round structured viruses)
Diarrhoea/Vomiting	Rotavirus Adenovirus Astrovirus Calicivirus Norovirus (mall round structured viruses)
Genital Infection	Herpes Simplex Virus (HSV) Chlamydia trachomatis Neisseria Gonorrhoea Syphilis (Treponema pallidum)
Heart disease	Coxsackie group B virus Mycoplasma pneumonia
Haemorrhagic cystitis	Adenovirus

TESTS TO BE ORDERED	
Provisional Diagnosis/ Symptoms	Possible Virus/ Agent/ Disease
"In Utero "infections	Rubella virus Cytomagalovirus (CMV) Parvovirus B 19 Toxoplasma gondii Varicella Zoster virus (VZV)
Lymphadenopathy & Glandular fever	Epstein Barr virus (EBV) Cytomegalovirus (CMV) Toxoplasma gondii
Organ donors	Hepatitis B & C viruses Human Immunodeficiency Virus (HIV) Cytomagalovirus (CMV) Toxoplasma gondii Human T-Lymphotropic Virus (HTLV) Treponema pallidum (TPHA)
Paraparesis	Human T-Lymphotropic Virus (HTLV) Enterovirus
Pleurodynia	Coxsackie group B viruses
Respiratory Infections	Influenza Respiratory Syncytial Virus (RSV) Parainfluenza Sars-CoV-2
Skin rashes	Human metapneumovirus Mycoplasma pneumonia Syphilis (Treponema pallidum) Enterovirus
Stomatitis	Herpes Simplex virus (HSV) Enterovirus

Other investigations may be carried out by arrangement. Please contact NVRL if further assistance is required.

General Telephone: +353 - 1 - 716 4401

Fax: +353 - 1- 2697611

E-mail: nvrl@ucd.ie

Website: <https://nvrl.ucd.ie>

11 HISTOPATHOLOGY DEPARTMENT (TALLAGHT HOSPITAL)

All Histology/Cytology specimens received in NGH are sent to and processed in the Histopathology Department at Tallaght. Requests are received on a blue Tallaght histology request form.

All Histology specimens taken must therefore meet the Tallaght Specimen Acceptance Criteria as outlined below.

Sample Acceptance Criteria for Histology Specimens

1. Completing the Request Form

The following information must be documented in a **LEGIBLE** manner on all sheets of the request form.

Items marked with an * are minimum identifiers and failure to provide the minimum data required will delay processing of the sample.

1. *Patient's **Hospital Number** (if request is on a registered patient)
2. *Patient's **Full Surname and Full Forename.**
3. *Patient's **Date of Birth**
4. ***Specimen Type**
5. §Clinical Details
6. *Patient's Full Current Address
7. *Location (Hospital Ward)
8. *Consultant/Clinician name
9. *Legible Signature of requesting Doctor
10. Contact or Bleep Number of requesting Doctor
11. Gender

§ For completeness of the final report, clinical information provided should include sufficient detail regarding the reason for the procedure.

Requests will be considered routine unless highlighted otherwise. Urgent samples require a referral form – NGH/SR/FM/005 available from specimen reception.

2. Labelling the Sample Container

The following information must be documented in a **LEGIBLE** manner on the sample container.




Items marked with an * are minimum identifiers and failure to provide the minimum data required will delay processing of the sample.

1. *Patient's **Full Surname**
2. *Patient's **Full Forename**
3. ***Hospital number**
4. ***Date of birth or address for external patients**
5. ***Specimen Type**

12 GUIDE TO PATHOLOGY TESTS: (Internal Requests and External Referrals)

Table 12.1: List of Tests to be requested on NGH Clinical Chemistry and Haematology Forms. Please read per column.

All these tests can be requested on a single form with the appropriate sample type. All these tests will have NGH stated as requesting location below

Clinical Chemistry <u>NGH Requests</u>	Clinical Chemistry <u>NGH Requests...</u> cntd	Haematology <u>NGH Requests</u>	Coagulation <u>NGH Requests</u>
1 lithium heparin (Orange top) sample is sufficient 	Alternative sample type required for tests in this column- refer below for further information/ specific sample required. Same request form can be used	1 EDTA (Pink top) sample is sufficient 	1 TrisodiumCitrate (Green top) is sufficient 
RENAL PROFILE	hCG + β- (separate lithium heparin sample)	FULL BLOOD COUNT (FBC)	COAG SCREEN
CHLORIDE	LI (Serum required)	ESR	INR
LIVER PROFILE	LDH (Serum required)	INFECTIOUS MONONUCLEOSIS SCREEN	APTT/APTT RATIO
BONE PROFILE	GLUCOSE (Fluoride Tube/Yellow Top)	BLOOD FILMS	PT
LIPID PROFILE	URINARY ALBUMIN/CREATININE RATIO or URINARY PCR	RETIC COUNTS	DDIMER
CRP	URINE REQUESTS FOR, ELECTROLYTES and CALCIUM/CREAT RATIO	MALARIA SCREEN	FIBRINOGEN
AMYLASE	24 HR URINE REQUESTS FOR TP, CREAT, ELEC, CA, PHOS	SICKLECELL SCREEN	
CK	ROUTINE CHEMISTRY ON FLUID SAMPLES		
MAGNESIUM	GLUCOSE ON FLUID SAMPLES		
AST	HBA1C (EDTA/FBC Sample)		
TFT'S			
ALCOHOL			
PARACETAMOL			
SALICYLATE			
URIC ACID			
BNP			
PSA			
TROP T (available to Internal Users only)			




Tests are listed in alphabetical order:



To search for a particular test use Ctrl + F on the keyboard to bring up search box. Antibody tests may be prefixed by Anti.

Please send separate samples for each different testing location as specified.





Please ensure label is attached correctly to the specimen container. Please label all copies of forms not just the top copy.







For order of draw refer to section 2.3.1 pg. 12/13 of this document.




Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
ACE Levels (Angiotensin Converting Enzyme)	Eurofins Biomnis	1 x 4.9 mL Serum gel tube or 1 mL BAL or CSF supernatant	 Sterile universal container	Do not use plasma (esp. EDTA). Non haemolysed, refrigerated. Spin, separate and freeze CSF supernatant. Must be frozen <1hr (CSF + BAL only). Please send to Lab during routine working hours	15 working days 15 working days
Acetaminophen (Paracetamol)	NGH (CC)	Blood 1 x 2.7 mL Lithium heparin gel tube		Take at least 4 hours post suspected dose.	1 working day
ACTH (Adrenocorticotrophic Hormone)	Eurofins Biomnis	Special vacutainer tube (EDTA + Aprotinin), pink in colour supplied on request from laboratory.		Spin, separate and freeze < 1 hr	15 working days









Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Acid Fast Bacilli (AFB)	Tallaght Hospital (Microbiology)	Sputum (Early morn x 3, on 3 consecutive days) Urine (EMU x 3, on 3 consecutive days) Pus Pleural fluid+other fluids Bronchoalveolar lavage/brushings	Sterile universal container	Refer to Section 10.15 TB/ZN. Include clinical details if patient has TB or is <i>clinically suspected of having TB.</i>	Up to 42 days Interim AFB smear report available at 1 working day
		Bone Marrow	Special bone marrow/blood culture bottle		
		Tissue	Sterile universal container	Do not use Formalin with tissue	
		CSF (1ml)	Sterile universal container	Must have white cell count > 6 cmm	
Actinomyces serology	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	10 working days
Activated Partial Thromboplastin Time (APTT)/APTT Ratio (APTTR)	NGH (Haem)	Blood 1 x 3.0 mL Trisodium citrate tube		Testing must be complete within 4 hours of specimen collection. Specimen must be filled to line. Over or underfilled samples cannot be processed.	1 working day






LABORATORY USER MANUAL



Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Activated Protein C Resistance (APCR)	Tallaght Hospital (Coagulation Laboratory)	2 x 3.0 mL Trisodium citrate tubes		Patient's anticoagulation status MUST be stated. Must be in NGH Lab by 9.30am if ordered as part of thrombophilia screen. If ordered on its own does not need to be in Lab by 09:30 am	12 weeks
Acylcarnitine	Eurofins Biomnis	Blood 1 x 2.7 mL Lithium heparin gel tube		Spin, separate and freeze within 1 hr	1 month
ADAMST-13	See Von Willebrand Factor Cleaving Protease				
Adenosine Deaminase	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube or 2 ml Pleural Fluid, Ascitic Fluid or CSF	 Sterile universal container	None	7 working days
Adenovirus Serology	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	6 working days
Adenovirus culture/ Qualitative PCR	NVRL	Bronchoalveolar lavage, Faeces (2-5g), Nasopharyngeal aspirate, Urine Throat swab	Sterile universal container Viral Transport Medium (VTM)	Contact NVRL for sample requirements	20 working days





Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Adenovirus Immunofluorescence (IF)	NVRL	Bronchoalveolar lavage, Nasopharyngeal aspirate, Sputum	Sterile Universal Container	None	3 working days
Adenovirus PCR	NVRL	Blood 1 x 2.7ml EDTA tube OR Blood 1 x 4.9 mL Serum gel tube	 	Send same day to NVRL, if not sending same day separate and freeze.	5 working days
Adenovirus (Electron Microscopy)	NVRL	Post Mortem Samples, Tissue Biopsy or stool	Sterile Universal Container	None	Variable
Alanine aminotransferase (ALT)	NGH (CC)	Blood 1 x 2.7 mL Lithium heparin gel tube		Non haemolysed sample	1 working day
Albumin	NGH (CC)	Blood 1 x 2.7 mL Lithium heparin gel tube		None	1 working day
Albumin Creatinine Ratio/ACR/ Urinary Microalbumin	NGH (CC)	Spot urine or 2 nd morning urine. 	Refer monovette tube (yellow cap/Urine Z) filled from 200 ml container as displayed. 	Urine container and tube are available from NGH Stores dept. Do not use for other urinary investigations e.g. C/S. To be used for ACR and PCR ONLY	1 working day








Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Albumin (Fluid)	NGH (CC)	Fluid Minimum volume 2 mls.	Universal container.	None	1 working day
Alcohol (Testing not for legal purposes)	NGH (CC)	Blood 1 x 2.7 mL Lithium heparin gel tube or 1 x 4.9 mL Serum gel tube	 	Do not use alcohol swab on arm	1 working day
Alcohol (personal)	Public Analyst Lab, Seamus Quirke Rd, Galway.	Blood 1 x 4.9 mL Serum gel tube or Urine Sample	 Universal Container	Alcohol Queries –Road Safety Act. / Public Order offence (where individual involved in incident wants their alcohol level measured independently.) Do not open sample. Samples are referred to Public Analyst. Laboratory, Seamus Quirke Rd. Galway. Requester to phone 091 581122 directly. A fee of 100 euro to accompany sample (cheque or postal order, made payable to The Health Service Executive West). The requesting GP should forward the samples directly to The Public Analyst Lab Galway by registered post in a padded envelope. GP contact details including phone number must be stated. If the sample is sent to the lab the result cannot then be used in any subsequent court proceedings. If patient does not want sample processed (due to fee) NGH will return sample to requesting doctor. The Public Analyst lab will not test for drugs food or cosmetics	10 working days







Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Aldolase	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Sample preferentially after 30 mins resting period. Non haemolysed serum. Store at 4°C	15 working days
Aldosterone Note : If requesting with Renin, 2 EDTA samples will be required	Eurofins Biomnis	1 x 2.7 mL EDTA tube or 1 x 4.9 mL Serum gel tube	 	Spin, separate & freeze within 4 hours 1 st sample: Patient lying down for 3 hours. 2 nd sample: Patient standing for 1 hour.	15 working days
Aldosterone (Mass Spectrometry)	Department of Clinical Biochemistry, Southmoor Road, Whythenshaw, Manchester, M23 9LT	Blood 2 x 2.7 mL EDTA tube		Spin, separate and freeze ASAP	15 working days
Alkaline Phosphatase (ALP)	NGH (CC)	Blood 1 x 2.7 mL Lithium heparin gel tube		None	1 working day
Alkaline Phosphatase Isoenzymes	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Raised Alkaline Phosphatase Refrigerated	10 working days
Alkaline Phosphatase Isoenzyme Electrophoresis	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Raised Alkaline Phosphatase Refrigerated	10 working days
Alpha 1 Anti-Trypsin : Quantitation	Immunology Dept, St James's Hospital	Blood 1 x 4.9 mL Serum gel tube		Spin and separate	15 working days





Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Alpha 1 Anti-Trypsin : Phenotyping	St James's Hospital – may be referred to Alpha 1 Foundation after quantitation	Blood 1 x 4.9 mL Serum gel tube		Only performed when quantitative values is < 1g/L at St James's or patients that have a first degree relative with alpha 1 deficiency.	28 working days
Alpha Feto Protein (AFP)	Tallaght Hospital (Clinical Chemistry)	Blood 1 x 2.7 mL Lithium heparin gel tube		None	5 working days
Alpha Galactosidase	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	10 working days
Aluminium	Eurofins Biomnis	Blood 1 x 4.0 mL non gel li heparin tubes only Standard li heparin tube cannot be used. Please request non- gel/green capped vacutainer li heparin tube from laboratory specimen reception.		Separate ASAP (max 1 hr).	15 working days.
Amikacin	Tallaght Hospital (Clinical Chemistry)	See Antibiotic Assays			
Amoebiasis	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	10 working days

Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Amino Acids (Blood)	Metabolic Laboratory, Children's University Hospital Dublin 1.	Blood 1 x 2.7 mL Lithium heparin gel tube		Spin, separate & freeze within 4 hours.	7 working days
Amino Acids (CSF)	Metabolic Laboratory, Children's University Hospital Dublin 1.	CSF	Universal Container	Paired blood should be taken within 4 hrs of CSF collection.	7 working days
Amino Acids (Urine)	Metabolic Laboratory, Children's University Hospital Dublin 1.	Early morning Spot urine	Universal Container – Min 5 ml	Dipstick for pH and freeze immediately. pH should be less than 8. Dispatch frozen sample. If > 8, ? Microbial contamination, request repeat sample.	7 working days
Aminophylline	Tallaght Hospital (Clinical Chemistry)	See Theophylline			
Amisulpride	Eurofins Biomnis	Blood 1 x 6 mL non gel Serum tubes only Standard serum tube cannot be used. Please request non- gel/red capped vacutainer serum tube from laboratory specimen reception.		Spin, separate & freeze within 4 hours	10 working days






Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Amitriptyline	Royal Hallamshire Hospital, Glossop Road, Sheffield, South Yorkshire S19 2JS	1 x 4.9 mL Serum gel tube		Spin and separate	15 working days
Amiodarone	Eurofins Biomnis	Blood 1 x 6 mL non gel Serum tubes only Standard serum tube cannot be used. Please request non- gel/red capped vacutainer serum tube from laboratory specimen reception		Sample immediately prior to next dose Spin, separate & freeze within 1 hour	15 working days
Ammonia	Eurofins Biomnis	Blood 1 x 2.7 mL EDTA tube		Spin, separate & freeze within 30 minutes	10 working days
Amphetamine	Eurofins Biomnis	Spot urine in Universal Container	Universal Container	Part of Urine Toxicology Screen	15 working days
Amylase (Blood)	NGH (CC)	Blood 1 x 2.7 mL Lithium heparin gel tube		None	1 working day
Amylase (Fluid)	NGH (CC)	Fluid in Universal container. Minimum volume 2 mls required	Universal Container	None	1 working day
Amylase (Urine)	Eurofins Biomnis	24 hr urine collection. or Early morning urine.	3L/ 24 hr Urine Container , 5 ml aliquot Universal Container, 5 ml aliquot	Plain container/ No additive Refrigerated. Minimum referral volume from either sample is 5 mls. Label as EMU/ 24 hr aliquot.	15 working days








Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Amyloid	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube and/or 3 ml CSF	 Universal Container	Spin, separate and freeze within 4 hrs. Spin, separate and freeze within 4 hrs	7 working days 2 months
Androstenedione (Delta-4- androstenedione)	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube or 1 x 2.7 mL Lithium heparin gel tube or 1 x 2.7 mL EDTA tube	  	Refrigerated	15 working days
Antibiotic assays (Gentamicin + Vancomycin)	NGH (Micro)	Blood 1 x 4.9 mL Serum gel tube		Refer to section 10.9.12 Antibiotic Assays. Gent + Vanc assayed in Micro NGH– Routine cut off time is 14.00. Weekends cut off time is 16:00	1 working day
Antibiotic assays (Amikacin and Tobramycin)	Tallaght Hospital (Microbiology)	Blood 1 x 4.9 mL Serum gel tube preferably or 1 x 2.7 mL Lithium heparin gel tube	 	Amikacin and Tobramycin assayed in TALLAGHT only (Samples for transport must be in lab by 09.00 including weekends)	1 working day






Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Anti Acetylcholine receptor antibodies (aka Myasthenia Gravis)/ AchR	Eurofins Biomnis	Blood 1 x 2.7 mL EDTA tube or 1 x 4.9 mL Serum gel tube	 	Non haemolysed serum or EDTA plasma. Spin, separate and freeze within 4 hrs	15 working days
Anti Adalimumab/ Humira antibodies Note: The level and the antibodies are tested.	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Spin, separate and freeze within 1 hr. Please include patient's schedule e.g. dose, frequency of dose and commencement date on treatment with request.	15 working days
Anti Adrenal Antibodies: ASMA, AMA, ALK microsomal antibodies	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	15 working days
Anti AMPA Receptor Antibodies	Eurofins Biomnis	1 mL CSF and/or Blood 1 x 4.9ml Serum gel tube	Sterile Universal Container 	None	15 working days
Anti Calcium Channel Antibodies/ Voltage Gated Calcium Channel Antibodies	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube.		None	3 weeks









Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Anti Cardiolipin Antibodies	If ordered with Lupus Anticoagulant send to Tallaght Hospital, (Coagulation Lab) otherwise send to Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	9 working days
Anti Cardiolipin Antibodies Can be part of Thrombophilia screen. Can also be sent on its own as above.	Tallaght Hospital (Coagulation Lab)	See Thrombophilia Screen			
Anti CASPR2 Antibodies	Eurofins Biomnis	300 µL CSF or Blood 1 x 4.9ml Serum gel tube	Sterile Universal Container 	None	14 working days
Anti CCP/Anti-cyclic Citrullinated Peptide Antibodies/ Anti Filaggrin antibodies	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	15 working days
Anti DPPX Antibodies/ Autoimmune Encephalitis Screen	St James's (Immunology)	Blood 1 x 6 mL Serum gel tube and/or 300 µL CSF	 Sterile Universal Container	None	15 working days

LABORATORY USER MANUAL









Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Anti Diuretic Hormone (ADH)	Eurofins Biomnis	Blood 1 x 5.0 mL Aprotinin Tube Special tube (EDTA & Aprotinin) pink in colour supplied on request from laboratory.		Spin, separate & freeze within 1 hr	15 working days
Anti DNA antibodies ds DNA (double stranded) ss DNA (single stranded)	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	15 working days
Anti Endomysial antibodies (endomysium cell antibodies)	Eurofins Biomnis	See endomysial/ endomysium antibodies			
Anti Epidermal Antibody/ Bulleous Pemphigiod antibodies	Eurofins Biomnis	1 x 4.9ml Serum gel tube		None	15 working days
Anti ENA Antibody Typing (SSA (Ro), SSB (La), Ro-La, Sm, RNP, Jo-1, Scl -70, Anti Centromere, Anti U1 RNP)	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Anti ENA Abs is tested only if ANA is positive unless requested by a Rheumatologist or NGH Consultant. GP requests will be referred for ANA	15 working days
Anti Factor Xa /Clexane	Tallaght Hospital (Coagulation Lab)	Blood 2 x 3.0 mL Trisodium citrate tubes		Contact NGH Haematology Lab. In consultation with Consultant Haematologist only. 4 hrs post dose. Send by taxi.	Variable








Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Anti GAD/Glutamic Acid Antibodies	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube or 1ml CSF	 Universal Container	Non-haemolysed sample. Refrigerated	15 working days. 15 working days.
Anti Ganglioside Antibodies	Eurofins Biomnis	Blood 1 x 4.9ml Serum gel tube		None	15 working days
Anti Gliadin Antibodies	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	15 working days
Anti Glomerular Basement Membrane antibody	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	15 working days
Anti Glycine Antibodies	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube or 1ml CSF	 Universal Container	Non-haemolysed sample. Refrigerated	15 working days.
Anti Granulocyte Antibodies	NHS Blood and Transplant 500 North Bristol Park, Northway, Filton, Bristol	1 x 4.9 mL Serum gel tube		Form 3E 'Histocompatibility & Immunogenetics' has to be completed by requesting doctor. Form available from Haematology Department.	10 working days
Anti Hepatitis B (Core & Surface Antigen-Anti HBcore/ Anti HBs)	NVRL	1 x 4.9 mL Serum gel tube		Use NVRL request form at following link https://nvrl.ucd.ie/sites/default/files/uploads/pdfs/LF-UM-001n_v7_Blood_borne_virus_investigation_request_form.pdf	3 -4 working days.







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Anti Hepatitis C (Anti HCV)	NVRL	1 x 4.9 mL Serum gel tube		Use NVRL request form at following link https://nvrl.ucd.ie/sites/default/files/uploads/pdfs/LF-UM-001n_v7_Blood_borne_virus_investigation_request_form.pdf	3 -4 working days.
Anti Heparin Platelet Factor 4 Complex antibodies (HIT)	St James's Hospital (Coagulation Lab)	Blood 2 x 4.9 mL Serum gel tubes		In consultation with Consultant Haematologist only. A 4T score must be filled out by the requesting clinician on the HIT Request Form. This form can be downloaded from the following link www.stjames.ie/media/https://www.stjames.ie/media/HIT%20request%20form%20(1).pdf 4T scores of 3 or less will not be tested. Samples must be in NGH by 9:30 am Mon-Fri only.	Variable
Anti Histone Antibodies	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	5 working days
Anti HMG-Co- A Reductase Antibodies	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	12 working days
Anti Humira Antibodies	Eurofins Biomnis	See Anti Adalimumab antibodies above			
Anti IA2 antibodies	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	15 working days






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Anti Insulin Antibodies	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube or 1 x 2.7 mL EDTA tube	 	Spin, separate & freeze within 4 hours	15 working days
Anti Intrinsic Factor Antibodies	Eurofins Biomnis	See Intrinsic Factor antibodies			
Anti Islet Cell Antibodies	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	15 working days
Anti LGII Receptor Antibodies	Eurofins Biomnis	300 µL CSF or Blood 1 x 4.9ml Serum gel tube		None	15 working days
Anti LKM Antibodies (Endoplasmic reticulum)	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	15 working days
Anti Microsomal Antibodies	Tallaght Hospital (Clinical Chemistry)	See Anti- thyroperoxidase antibodies (TPO)			
Anti Mitochondrial Antibodies (AMA)	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube or 1 x 2.7 mL Lithium heparin gel tube	 	None	5 working days.
Anti Mullerian hormone (AMH)	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Suspend biotin treatment or food supplements containing biotin for 8 days prior to sampling.	15 working days






LABORATORY USER MANUAL




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Anti MuSK (Muscle Specific Kinase)	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	20 working days
Anti Myeloperoxidase antibodies (Anti- MPO, Anti-La)	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	15 working days
Anti Neuron (Neuronal) Antibodies (Anti Hu/Anti RI/Anti Yo)/Anti- amphiphysin , Ant- CV2) Markers for Paraneoplastic Neurological Syndromes.	St James's (Immunology)	Blood 1 x 4.9 mL Serum gel tube or CSF 1mL	 Sterile Universal Container	None	7 working days
Anti Neutrophil cytoplasmic antibodies (ANCA) or (PANCA), also includes PR3 & MPO.	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	15 working days
Anti Nuclear Antibodies (ANA)/Anti Centromere Antibodies	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	15 working days
Anti NMDA Receptor Antibodies	St James's (Immunology)	CSF 1mL and/or Blood 1 x 4.9ml Serum gel tube	Sterile Universal Container 	None	15 working days
Anti Ovarian Antibodies	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	15 working days
Anti Parietal Cell Antibodies	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	15 working days






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Anti Phospholipid Antibodies <i>Request 1 and 2 1. cardiolipin antibodies and 2 : beta 2 glycoprotein</i> May be part of thrombophilia screen	Eurofins Biomnis Tallaght Hospital (if received as part of a thrombophilia screen)	Blood 1 x 4.9 mL Serum gel tube See relevant sections for anti-cardiolipin antibodies, beta 2 glycoprotein and Lupus anticoagulant	 If part of thrombophilia screen do full set of bloods – as per thrombophilia screen requirements but if requested alone – 1 serum sample is sufficient	None	7 working days
Anti Phospholipase A2 Receptor Antibodies	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	15 working days
Anti Potassium channel antibodies Includes LGI1 + CASPR2 antibodies	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube or CSF 1ml	 Sterile Universal Container	None	5 weeks
Anti Pyruvate Kinase Dehydrogenase	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	15 working days
Anti Smooth Muscle Antibodies (ASMA)	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	15 working days
Anti Streptolysin O titre (ASOT)	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	6 working days
Antithrombin (AT)	Tallaght Hospital (Coagulation Lab)	Blood 2 x 3.0 mL Trisodium citrate tubes		The patient's anticoagulation status must be stated on the request form. Must be in NGH Lab by 9.30am.	12 weeks unless deemed urgent by Consultant Haematologist




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Anti Thyroperoxidase antibodies (TPO)	Tallaght Hospital (Clinical Chemistry)	Blood 1 x 2.7 mL Lithium heparin gel tube		None	5 working days
Anti TSH Receptor Antibodies (TRAB)	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	15 working days
Anti Voltage Gated Calcium Channel Antibodies	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube Cannot be performed on CSF		None	4 - 5 weeks
Anti Phospholipid Screen (Includes anti-cardiolipin antibodies, Beta (β_2) glycoprotein and lupus anticoagulant). May be part of thrombophilia screen.	Tallaght Hospital (Coagulation Lab)	See relevant sections for anti-cardiolipin antibodies, Beta (β_2) glycoprotein and Lupus anticoagulant			3-4 working days
Anti Voltage Gated Potassium Channels Antibodies	Eurofins Biomnis	Blood 1 x 4.9ml Serum gel tube or 300 μ L CSF	 Sterile Universal Container	None	2 – 3 weeks
Anti ZNT8 antibodies	Eurofins Biomnis	Blood 1 x 4.9ml Serum gel tube		None	20 working days
Apolipoprotein A/B	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Fasting sample	15 working days






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Apolipoprotein E	Eurofins Biomnis	Blood 2 x 2.7 mL EDTA tube		Consent form required at following link https://www.eurofin.com/refere/ntiel/liendoc/reseignements/INTGB/D43-INTGB-Attestation-Consent_Genetic.pdf	20 working days
Apolipoprotein C3	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Spin, separate and freeze < 4 hrs.	15 working days
Arsenic	Eurofins Biomnis	Blood 1 x 4.0 mL non gel li heparin tubes only Standard li heparin tube cannot be used. Please request non- gel/green capped vacutainer li heparin tube from laboratory specimen reception		Spin and separate	28 working days
Aspartate aminotransferase (AST)	NGH (CC)	Blood 1 x 2.7 mL Lithium heparin gel tube		Non- haemolysed sample	1 working day
Aquaporin 4	Oxford University Hospital, Immunology Dept, Churchill Hospital, Old Road, Headington, Oxford OX3 7LE UK. Phone 00443003047777. www.ouh.nhs.uk/Immunology .	Blood 1 x 4.9 mL Serum gel tube		Refrigerated	10 working days











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Aspergillus Serology/Antibodies /Farmers lung	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Specific request form required at link below https://www.gov.uk/government/publications/diagnostic-mycology-and-assays-referral-form for Mycology Reference Lab	5 - 14 working days
Aspergillosis soluble antigen	Eurofins Biomnis	BAL	Sterile Universal Container	Refrigerated Specific request form required at link below https://www.gov.uk/government/publications/diagnostic-mycology-and-assays-referral-form for Mycology Reference Lab	5 - 14 working days
Atypical Pneumonia screen (Inc. Chlamydia pneumoniae abs, Legionella abs serotype 1-6 and Mycoplasma pneumoniae abs)	Eurofins Biomnis	Blood 1x 4.9 mL Serum gel tube		None	5 - 10 working days
	NGH (Mic)	Urine	Sterile Universal Container	Legionella antigen Serotype 1 and Pneumococcal ag only See section 10.1.10 for testing criteria	1 working day
Auto Immune Liver Screen : AMA,ANA,ASM A, Anti-LKM, Alk-Phos	Eurofins Biomnis – Serum	Blood 1 x 4.9 mL Serum gel tube		None	12 working days
	NGH – Li Heparin (Alk Phos)	Blood 1 x 2.7 mL Lithium heparin gel tube			
Avian Precipitants/ Antibodies/ Bird Flu	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	15 working days

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BCR ABL	Cancer Molecular Diagnostic Lab, St James's Hospital	Blood 2 x 2.7 mL EDTA		Must be in CMD Lab before 3.00pm	Variable
Bence Jones Protein (Urine Electrophoresis)	Eurofins Biomnis	See Electrophoresis (Urine)			
Beta Amyloid (1-42), Total Tau, Phospho Tau (Neurodegenerative Assay)	St James's Hospital (Immunology)	CSF- 4 mls, taken into separate polypropylene tube available from the laboratory prior to sampling and not used for C&S/Cell Count		Assayed Mon- Fri only. Dispatch immediately on receipt. Phone 01 4162925 prior to dispatch. Sample must arrive at St James's within 2 hrs of collection and at latest 4 pm so must be taken early in the day.	1-2 working days
Beta D glucan	Mycology Reference Laboratory. National Infection Services, PHE South West Laboratory, Science Quarter, Southmead Hospital, Bristol BS10 5 NB England Tel : 0117 4146222	Blood 1 x 4.9 mL Serum gel tube		Spin, separate and freeze within 4 hrs. Specific request form required available at https://www.gov.uk/government/publications/diagnostic-mycology-and-assays-referral-form	15 working days







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Beta (β_2) Glycoprotein	If ordered with Lupus Anticoagulant send to Tallaght Hospital (Coagulation Lab) otherwise send to Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	9 working days
Beta 2 Macroglobulin (Blood)	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	15 working days
Bicarbonate (HCO ₃) Plasma Note: see below In-Patients : Available using Arterial/Venous sample only on ABG analysers at NGH see below:	Tallaght Hospital (Clinical Chemistry)	Blood 1 x 2.7 mL Lithium heparin gel tube		A separate unopened lithium heparin sample is required. Send unopened sample to Tallaght Hospital by bike or taxi. Sample must be assayed within 6hrs. Requests must be received in NGH by 11:30 am.	2 working days.
Bicarbonate (HCO ₃) Arterial/Venous	NGH Blood Gas Analysers (Inpatient only)	Radiometer safePICO Blood Gas Syringe: Sample Volume: 1 ml		Analyse within 15 mins Hand deliver to Laboratory – do not send sample in PTS (Chute) system.	Assayed on receipt
Bile Acids	Sheffield Children's Hospital Western Bank Sheffield S10 2TH.	Blood 1 x 2.7 mL Lithium heparin gel tube and 5-10 ml fresh urine in Universal Container	 Sterile Universal Container	None	15 working days







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Bilharzia (Schistosoma)	Eurofins Biomnis	See Schistosoma Serology/ Schistosoma Eggs below			
Bilirubin Direct (Conjugated Bilirubin)	Tallaght Hospital (Clinical Chemistry)	Blood 1 x 2.7 mL Lithium heparin gel tube		Not performed on day old sample Total Bilirubin must be > 30µmol/L Sample must be light protected Tinfoil can be used to light protect the sample. Please ensure sample is labelled correctly prior to protecting from light.	3 working days
Bilirubin Total	NGH (CC)	Blood 1 x 2.7 mL Lithium heparin gel tube		Non- haemolysed sample	1 working day
Blood Cultures	NGH (Mic)	10 mls blood taken into a set of BactT/ALERT blood culture bottles For TB request special bottles required from Microbiology Dept St James's Hospital. For suspected Infective endocarditis send 3 sets from different lines		Refer to Section 2.2 and 2.3- Phlebotomy and section 10.9.1. Blood Cultures. Transport to Lab immediately. Blood cultures are continuously monitored and processed 24 hours a day	As soon as possible from time of positivity (Positive Blood Culture) 5 working days (Negative Blood Culture)





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Blood Films (Peripheral)	NGH (Haem)	Blood 1 x 2.7 mL EDTA tube		Film should be requested within 24hrs of sample collection	1-2 working days
Blood Gas Arterial/Venous	NGH Blood Gas Analysers Inpatient only	Radiometer safePICO Blood Gas Syringe: Sample Volume: 1 ml		Analyse within 15 mins Hand deliver to Laboratory – do not send sample in PTS (Chute) system	Assayed on receipt
Bone Marrow Aspirate	Tallaght Hospital, (Special Haematology Laboratory)	2 stained bone marrow aspirate slides		Request to be reviewed by Haematology Laboratory Scientist prior to referral	Variable
Bone Marrow Immunophenotyping	Tallaght Hospital, (Special Haematology Laboratory)	Bone Marrow aspirate sample in RPMI		Request to be reviewed by Haematology Laboratory Scientist prior to referral	Variable
Bone Specific Alkaline Phosphate	Eurofins Biomnis	Non haemolysed 1 x 4.9 mL Serum gel tube		Spin, separate & freeze within 4hrs	15 working days
Bordetella pertussis (whooping cough)	Tallaght Hospital (Microbiology)	Perinasal swab		Phone Micro lab 045 843039 to pre-order swab & medium	7-10 working days
Bordetella pertussis (whooping cough) Serology	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	6 working days
Borrelia burgdoferi (Lyme disease)	NVRL	Blood 1 x 4.9 mL Serum gel tube or CSF 500 µl *Must be accompanied by contemporaneous 1 x 4.9 mL Serum tube*	 Sterile Universal Container	Clinical details must be provided for confirmatory testing. If molecular testing required contact NVRL	5 working days






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Botulism (<i>Clostridium botulinum</i>)	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	5 working days
BNP/ Nt-Pro BNP	NGH (CC)	See Nt- Pro BNP			
Brucella serology (Brucellosis)	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	6 working days
Bullous Pemphigoid Antibodies.	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel		None	15 working days
Cadmium	Eurofins Biomnis	Blood 2 x 2.7 mL Lithium heparin gel tube		None	10 working days
C1 Inhibitor complement fraction, <i>quantitation only</i>	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	10 working days
C1 Inhibitor- complement fraction – <i>functional</i> + <i>quantitation</i>	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube and 2 x 3.0 mL Trisodium citrate tube	 	Spin, separate & freeze specimens <1hr. Do not collect on Saturdays	4 working days
C Peptide	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube or 1 x 2.7 mL Lithium heparin gel tube or 1 x 2.7mL EDTA tube	  	Spin, separate & freeze within 4 hours. (If received as part of 72 hour fast for investigation of hypoglycaemia requires prior notification to Laboratory at 045 849911). First set of bloods must reach Lab either Mon (exclude BH) or Tues only before 4pm.	15 working days









LABORATORY USER MANUAL




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CA 153	Tallaght Hospital (Clinical Chemistry)	Blood 1 x 2.7 mL Lithium heparin gel tube		Provide appropriate clinical details.	5 working days
CA 199	Tallaght Hospital (Clinical Chemistry)	Blood 1 x 2.7 mL Lithium heparin gel tube		Provide appropriate clinical details.	5 working days
CA 125	Tallaght Hospital (Clinical Chemistry)	Blood 1 x 2.7 mL Lithium heparin gel tube		Provide appropriate clinical details.	5 working days
CA 27.29 (Breast Cancer Marker)	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Provide appropriate clinical details Spin, separate & freeze within 1 hr.	Variable
CA72-4	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Provide appropriate clinical details. Spin & Separate Mon-Thurs. Spin, separate & freeze within 1 hr.	Variable
Calcium (Blood)	NGH (CC)	Blood 1 x 2.7 mL Lithium heparin gel tube		Avoid Venous Stasis – no tourniquet.	1 working day.
Calcium/ Creatinine Ratio (Urine)	NGH (CC)	Urine: (Sample of choice is 2nd early morning urine). Random urine is acceptable.	Sterile Universal Container.		1 working day
Calcium (Urine)	NGH (CC)	24 hour Urine collection	3L/24 hr Urine Container	20 mls 6M HCL additive required. 5 ml aliquot of 24 hr collection analysed.	1 working day





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Calcium (Ionised) Note: Available using Arterial/Venous sample on ABG analyser at NGH see below:	Eurofins Biomnis	Blood 1 x 5 mL SST tube (Gold coloured tube must be pre-ordered by laboratory therefore is only available as special request).		Contact the laboratory to pre- arrange. Allow to coagulate without opening tube, centrifuge and freeze < 1 hr without decanting	15 working days
Calcium (Ionised) Arterial/ Venous	NGH Blood Gas Analysers Inpatient only	Radiometer safePICO Blood Gas Syringe: Sample Volume: 1 mL		Analyse within 15 mins Hand deliver to Laboratory – do not send sample in PTS (Chute) system	Assayed on receipt
Calcitonin	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Spin, separate & freeze within 4 hours	15 working days
Calicivirus (RSV- Norovirus & Sapovirus) PCR	NVRL	Faeces	Sterile Universal Container	None	5 working days
Carbamazepine	Tallaght Hospital (Clinical Chemistry)	Blood 1 x 2.7 mL Lithium heparin gel tube		Pre Dose (morning)	5 working days
Carboxyhaemoglobin (CO) Arterial/ Venous	NGH Blood Gas Analysers (Inpatient only)	Radiometer safePICO Blood Gas Syringe: Sample Volume: 1 ml		Analyse within 15 mins Hand deliver to Laboratory – do not send sample in PTS (Chute) system	Assayed on receipt
Carcinoembryonic Antigen (CEA).	Tallaght Hospital (Clinical Chemistry)	Blood 1 x 2.7 mL Lithium heparin gel tube		Provide appropriate clinical details.	5 working days.






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Catecholamines (Plasma) (Noradrenaline, Adrenaline, Dopamine).	Beaumont Hospital (Catecholamine Lab)	See Methanephrines (Plasma Free Methanephrines) below.			
Catecholamines (Urine) Includes Dopamine, Adrenaline, Noradrenaline, Total Metanephrine and Total Norametanephrine	Beaumont Hospital (Catecholamine Lab)	See Methanephrines (Urine) below.			
CD4 Count	St James's Hospital (Immunology)	Blood 2 x 2.7 mL EDTA tube. Refer to Lymphocyte Subsets		Sample must be analysed within 24hrs of collection. Cut- off in SJH 15:00 daily.	4 working days
CDT (Carbohydrate D Transferritin)	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	15 working days
CD8 Count	St James's Hospital (Immunology)	Blood 2 x 2.7 mL EDTA tube		Sample must be analysed within 24hrs of collection. Cut- off in SJH 15:00 daily.	4 working days
CD 19 (Cluster of differentiation 19, B-lymph surface antigen)	St James's Hospital (Immunology)	Blood 2 x 2.7 mL EDTA tube		Sample must be analysed within 24hrs of collection. Cut- off in SJH 15:00 daily.	4 working days
CD163	St James's Hospital (Immunology)	Urine (MSU).	Sterile Universal Container	None	4 working days
CEA	Tallaght Hospital (Clinical Chemistry)	See Carcinoembryonic Antigen above			









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Ceruloplasmin	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Always specify patient's age and gender.	15 working days
Chickenpox	NVRL	See Varicella Zoster Virus.			
Chikungunya	NVRL	Blood 1 x 4.9 mL Serum tube and 1 x 2.7 mL EDTA tube	 	By prior arrangement only. Contact NVRL	Variable
Chlamydia trachomatis- PCR	NVRL	APTIMA collection device kits. Tests for <i>Chlamydia trachomatis</i> and <i>Neisseria gonorrhoea</i> simultaneously, for use on non-blood samples 3 types-vaginal swab; urine; and Unisex/endocervical swab.	APTIMA collection device kit only Fill urine samples to black line	Kits available from NVRL – refer to https://nvrl.ucd.ie only. Ensure urine specimen containers are filled to the correct volume and are not past expiry date stated. Use NVRL STI form available at following link. https://nvrl.ucd.ie/sites/default/files/uploads/pdfs/LF_UM_001o_rev8_STI_Inv estigation_Request_Form.pdf	7 working days
Chlamydia trachomatis – Serology	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Patients on Biotin treatment must stop treatment 8 days prior to testing	5 working days
Chloride	NGH (CC)	Blood 1 x 2.7 mL Lithium heparin gel tube		None	1 working day
Chloride	Eurofins Biomnis	Urine	Universal Container	None	3 working days






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Chlorpromazine	Eurofins Biomnis	Blood 1 x 6 mL non gel Serum tubes only Standard serum tube cannot be used. Please request non-gel/red capped vacutainer serum tube from laboratory specimen reception		Spin, separate & freeze within 4 hours.	10 working days
Cholesterol	NGH (CC)	Blood 1 x 2.7 mL Lithium heparin gel tube		None	1 working day
Cholesterol – HDL (high density lipoprotein)	NGH (CC)	Blood 1 x 2.7 mL Lithium heparin gel tube		None	1 working days
Cholesterol – LDL calculated (low density lipoprotein)	NGH (CC)	Blood 1 x 2.7 mL Lithium heparin gel tube		None	1 working day
Cholinesterase	Eurofins Biomnis	Blood 1 x 2.7 mL Lithium heparin gel tube or 1 x 4.9 mL Serum gel tube	 	None	15 working days
Chromium	Eurofins Biomnis	Blood 1 x 6 mL Sodium Heparin Sample tube, dark blue cap Sample tube may need to be preordered – contact the laboratory specimen reception.		None	15 working days
Chromogranin A	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Spin, separate & freeze within 4 hours.	15 working days







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Chromogranin B	Eurofins Biomnis	Aprotinine (as used for ACTH) Special tube (EDTA+ Aprotinine) pink in colour supplied upon request from lab		Spin, separate and freeze < 1 hr.	15 working days
Chromosomal Analysis	Eurofins Biomnis	See Karyotyping			
Citrate/Citric Acid (Serum)	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Spin, separate and freeze	15 working days
Citrate/Citric Acid (Urinary)	Eurofins Biomnis	24 hour Urine collection	3L/24 hr Urine Container. Plain/Non Acidified.	Frozen 5ml aliquot of 24 hr collection referred for analysis.	15 working days.
CJD (Creutzfeldt Jakob Disease) (Protein14-3-3 /Prion protein, S- 100 B) RT-QulC testing R2- 2U -1CQ (will be sent to Edinburgh by Beaumont if requested)	Beaumont Hospital (Neuropathology Laboratory)	CSF 2-5 mls	Sterile Universal Container	Clinician must contact Neuropathology Beaumont Hospital PRIOR to taking sample to arrange testing. CJD questionnaire & sampling instructions (obtained from Specimen Reception) - must be filled in by requesting clinician. Samples must be sent asap (within 30 mins). Samples with high cell counts are not acceptable.	10 working days
CK Total	NGH (CC)	Blood 1 x 2.7 mL Lithium heparin gel tube		Non- haemolysed sample	1 working day
CLO antibodies (H. pylori)	Eurofins Biomnis	See Helicobacter serology			








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Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Clomipramine	Eurofins Biomnis	Blood 1 x 6 mL non gel Serum tubes only Standard serum tube cannot be used. Please request non- gel/red capped vacutainer serum tube from laboratory specimen reception		Spin, Separate and freeze within 4 hours.	15 working days
Clonazepam /Rivotril	Eurofins Biomnis	Blood 1 x 6 mL non gel Serum tubes only Standard serum tube cannot be used. Please request non- gel/red capped vacutainer serum tube from laboratory specimen reception		Spin, Separate and freeze within 4 hours.	15 working days
Clostridium difficile	NGH (Mic)	Faeces	Sterile Universal container	Loose stool samples only	1 working day
Clozaril (FBC)	Eurofins Biomnis	Blood 1 x 2.7ml EDTA tube		Eurofins Biomnis reports to Clozaril Patient Monitoring Service (CPMS).	1 working day
Clozaril Level/ Clozapine	Eurofins Biomnis	Blood 1 x 4.0 mL non gel li heparin tubes only Standard li heparin tube cannot be used. Please request non- gel/green capped vacutainer li heparin tube from laboratory specimen reception.		None	15 working days


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CMV Culture (Cytomegalovirus)	NVRL	Bronchoalveolar Lavage (BAL) Nasopharyngeal aspirate (NPA) Urine	Sterile Universal container	By prior arrangement only. Contact NVRL	21-28 working days
CMV Serology	NVRL	Blood 1 x 4.9 mL Serum gel tube		None	3 working days
CMV PCR	NVRL	Blood 1 x 2.7ml EDTA tube or CSF Urine	 Universal Container	Send to NVRL same day .If not sending same day then separate and freeze.	2 working days
CMV PCR (CSF).	NGH (Mic)	See CSF for Virology			
Coagulation Correction tests	NGH (Haem/Coag)	Blood 1 x 3.0 mL Trisodium citrate tubes		In consultation with Consultant Haematologist only. Coagulation status must be stated.	1 working day
Coagulation Factor Assays <i>(excluding FXIII and vWF)</i> <i>Single factor assays only. For multiple factor assays refer to intrinsic and extrinsic factor assays.</i>	Tallaght Hospital (Coagulation Lab)	Blood 2 x 3.0 mL Trisodium citrate tubes		Must be in Naas Lab by 9.30am. In consultation with Consultant Haematologist only	12 weeks: Unless deemed urgent by Consultant Haematologist
Coagulation factor inhibitor assay (e.g. FVIII inhibitor)	St James's Hospital (NCHD/ National Coagulation Centre)	Blood 3 x 3.0 mL Trisodium citrate tubes		In consultation with Consultant Haematologist only. Samples must be received in NCHCD by 16:00 Mon-Fri.	1 month approx.



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Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Cobalt	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube or 1 x 2.7 mL EDTA tube or 1 x 2.7 mL Lithium heparin gel tube	  	None	15 working days
Coeliac antibodies (TTG antibodies)	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	15 working days
Cold agglutinins	Eurofins Biomnis	Blood 2 x 2.7 mL EDTA tube (whole blood) or 1 x 7.5ml EDTA tube (whole blood)		Sample must be stored at room temp. Do not separate the sample & store at room temp.	6 working days
Complement (C3 and C4)	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	5 working days
Connective Tissue Disease Screen : Beta (β_2) Glycoprotein, ENA, Immunoglobulins	Eurofins Biomnis – ENA + Beta (β_2) Glycoprotein, Tallaght Hospital (Clinical Chemistry)- Immunoglobulins	Blood 2 x 4.9 mL Serum gel tubes. 1 for Eurofins Biomnis , 1 for Tallaght		None	15 working days
Copper (Blood)	Eurofins Biomnis	Blood 1 x 6 mL sodium heparin plasma tube – dark blue cap Sample tube may need to be preordered – contact the laboratory specimen reception.		None	15 working days



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Copper (Urine)	Eurofins Biomnis	24 hr Urine collection.	3L/ 24 hr Urine Container	Plain container No additive required. Minimum referral volume 5 mls of 24 hr collection.	15 working days
Coronavirus/ Sars CoV- 2 PCR	NGH (Mic) (NGH patients only) (Influenzae A + B + RSV tested simultaneously on same swab)	Oronasopharyngeal/ nasopharyngeal swab in Viral Transport Media		Refer to section 10.9.17 Coronavirus testing. Performed on-site daily	1 working day
	NVRL	Respiratory secretions- BAL, NPA, Sputum Oronasopharyngeal/na sopharyngeal Nasal swab Throat swab	Sterile Universal container Viral Transport Media	None	2- 3 working days
Cortisol (Random)	Tallaght Hospital (Clinical Chemistry)	Blood 1 x 2.7 mL Lithium heparin gel tube		None	5 working days
Cortisol (am)	Tallaght Hospital (Clinical Chemistry)	Blood 1 x 2.7 mL Lithium heparin gel tube		Patient must be resting. Take between 6-10 am. Record time on sample.	5 working days
Cortisol (pre synacthen)	Tallaght Hospital (Clinical Chemistry)	Blood 1 x 2.7 mL Lithium heparin gel tube		Patient must be resting. Record 'pre-synacthen' and record time on sample.	5 working days
Cortisol (30 mins post synacthen)	Tallaght Hospital (Clinical Chemistry)	Blood 1 x 2.7 mL Lithium heparin gel tube		Take exactly 30 mins post synacthen. Record '30 mins post synacthen' and time on sample.	5 working days



Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Cortisol (60 mins post synacthen) If clinically indicated.	Tallaght Hospital (Clinical Chemistry)	Blood 1 x 2.7 mL Lithium heparin gel tube		Take exactly 60 mins post synacthen. Record '60 mins post synacthen' and time on sample.	5 working days
Cortisol Binding Globulin	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Spin, separate and freeze within 4 hrs	4 working days.
Cortisol (Dexamethasone Suppression test)	Tallaght Hospital (Clinical Chemistry)	Blood 1 x 2.7 mL Lithium heparin gel tube		Specimen taken at 8.00 am Day 0 . Dexamethasone administered at midnight. Specimen taken at 8.00 am Day 1 . Record dates and times on samples	5 working days
Cortisol (Urine)	Eurofins Biomnis	24 hr Urine collection	3L/24 hr Urine Container	Plain container/no additive Refer min 10 mls 24 hr collection. Label as 24 hr aliquot	15 working days
Coxiella burnetti Serology (Q Fever antibodies)	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	4 working days.
Coxsackie virus serology (Picornavirus)	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	6 working days
CRE Screen	NGH (Mic)	Faecal/Rectal Swab Faeces	Red Topped Dual Swab = Copan swab Sterile Universal Container	See Section 10.9.13 Screening methods. All swabs cultured. Urgent Molecular testing requires prior approval.	1-5 working days. Same day for CPE molecular testing
Creatine Kinase (CK)	NGH (CC)	Blood 1 x 2.7 mL Lithium heparin gel tube		Non-haemolysed sample	1 working day






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Creatinine	NGH (CC)	Blood 1 x 2.7 mL Lithium heparin gel tube		None	1 working day
Creatinine Clearance	NGH (CC)	24 hr Urine collection and	3L/ 24 hr Urine Container	Plain container, no additive required. 5 ml aliquot of collection required for analysis	1 working day
		Blood 1 x 2.7 mL Lithium heparin gel tube		Blood sample must be taken during 24 hour collection	1 working day
C Reactive Protein	NGH (CC)	Blood 1 x 2.7 mL Lithium heparin gel tube		None	1 working day
CTX1/ C- Terminal Telo peptide	Eurofins Biomnis	1 x 4.9 mL Serum gel tube		Spin, separate & freeze within 4 hrs. Non haemolysed	15 working days
		or 1 x 2.7 mL EDTA tube			
Cryoglobulins	Eurofins Biomnis	Blood 1 x 6 mL non gel Serum tubes only Standard serum tube cannot be used. Please request non- gel/red capped vacutainer serum tube from laboratory specimen reception		Draw sample into prewarmed tube. Keep warm till clots. Transport to lab at ambient temp. Spin and separate immediately.	12 working days
Cryptococcus neoformans/ Cryptococcal antigen	Eurofins Biomnis Except for CSF which goes to Tallaght (Microbiology)	BAL Urine	Sterile Universal Container	None	5 working days
		Blood 1 x 4.9ml Serum gel tube CSF 300µl (Tallaght)	 Sterile Universal Container		









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Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Cryptosporidium If requested with Ova and parasites refer to Eurofins Biomnis	Cherry Orchard or Eurofins Biomnis	Faeces	Sterile Universal Container	None	7-10 working days
CSF for Autoimmune Encephalitis panel (DPPX, NMDA, AMPA, Anti glutamate receptor)	St James's (Immunology)	300 µL CSF and Blood 1 x 6 mL Serum gel tube	Sterile Universal Container 	None	15 working days
CSF for Cytology	Tallaght Hospital (Cytology/Histo pathology Lab)	CSF 0.5mL	Sterile Universal Container	Original sample will be referred if any cells present	7-10 working days.
CSF for Cytospin	Tallaght Hospital (Special Haematology Laboratory)	CSF- Micro Dept will prepare second unstained slide for referral to Tallaght	Sterile Universal Container	CSF must have cells present and must be authorised by Consultant Haematologist.	Variable
CSF for fungal analysis Biofire® fungal/yeast targets analysed include: <i>Cryptococcus neoformans/gattii</i>	NGH (Mic)	5-10 mL divided into three sterile universal containers	Sterile Universal Container	Refer to Section 10.9.2 CSF for complete list of targets analysed by BioFire® on CSF WCC >6	BioFire® PCR (if performed) available as soon as possible after receipt Culture=72hr to 2weeks
CSF for Immunophenotyping	Tallaght Hospital – (Special Haematology Laboratory)	CSF sample in RPMI	Universal Container	RPMI supplied by Haematology Lab	Variable
CSF for Microscopy, culture and sensitivity Biofire® bacterial targets analysed if WCC>6 include: <i>E.coli K1; Haem influenza; List monocytogenes; N.meningitidis; Streptococcus agalactiae; and Strep pneumoniae</i>	NGH (Mic)	5-10 mL divided into three sterile universal containers	Sterile Universal Container	Refer to Section 10.9.2 CSF for complete list of targets analysed by BioFire® on CSF WCC >6	Microscopy + BioFire® PCR (if performed) available as soon as possible after receipt Culture=72hr








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Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
CSF for Neurodegenerative Assay (B-amyloid (1-42), Total Tau(hTau Ag), Phospho Tau(181P))	St James's Hospital (Immunology)	CSF- 4 mls, taken into separate polypropylene tube available from the laboratory prior to sampling and not used for C&S/Cell Count		Assayed Mon-Fri only. Dispatch immediately on receipt. Phone 01 4162925 prior to dispatch. Sample must arrive at St James's within 2 hrs of collection and at latest 4 pm so must be taken early in the day.	1-2 working days
CSF for Oligoclonal bands	St James's Hospital (Immunology)	CSF 0.5 mL and Blood 1 x 4.9ml Serum gel tube	Sterile Universal Container 	The CSF specimen MUST be accompanied by a serum specimen for oligoclonal bands. Serum/CSF samples on their own will not be referred. Serum can be taken up to 7 days prior to the CSF but no more than 2 days after.	7-10 working days
CSF for TB/ZN	Tallaght Hospital (Microbiology)	CSF 1 mL	Sterile Universal Container	Original sample will be referred only if CSF WCC is raised.	Up to 7 weeks. Preliminary micro result in 1 working day.
CSF for Virology Biofire® Viral targets analysed include: CMV, HSV 1&2, VZV, Enterovirus, Human herpesvirus 6, Human parechovirus	NGH (Mic)	CSF 200 µL	Sterile Universal Container	Refer to Section 10.9.2 CSF, for complete list of targets analysed by BioFire® on CSF WCC >6 Specify all viruses suspected if not part screen, Please note: <u>Mumps</u> is not part of screen. Contact Lab/Consultant Microbiologist if required	BioFire® PCR (if performed) available as soon as possible after receipt





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Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
CSF for Virology (Screen includes Herpes Simplex Virus 1 & 2, Varicella Zoster Virus, Enterovirus and Parechovirus).	NVRL	CSF 0.5 mL	Sterile Universal Container	Specify all viruses suspected if not part of standard screen	7-10 working days
CTX1- C-Terminal Telo peptide	Eurofins Biomnis	1 x 4.9 mL Serum gel tube or 1 x 2.7 mL EDTA tube	 	Spin, separate & freeze within 4 hrs	15 working days
Culture and Sensitivity Faeces Performed by Seegene PCR Method (Molecular targets inc Salmonella, Shigella/EIEC, E.coli 0157, Campylobacter, Yersinia, C.diff)	NGH (Mic)	Faeces	Sterile Universal Container If multiple tests required please send more than 1 sample	Refer to Section 10.9.11 Faeces.	3 working days
Culture and Sensitivity – including Fungal if requested	NGH (Mic)	Fluids: Amniotic, bile, bursa, joint, pericardial, peritoneal, pleural, synovial 5-10 mls	Sterile Universal Container	Refer to Section 10.9.3 Fluids, for specimen collection information	2 -14 working days
		Genital swabs: Cervical, endocervical, high vaginal (HVS), penile, urethral, vulval	Transport swab	Refer to Section 10.9.8 Genital Infections, for specimen collection information	2 -14 working days
		Sputum / BAL	Sterile Universal Container	Refer to section 10.9.4 Sputum, for specimen collection information	2 -14 working days




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Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Culture and Sensitivity – including Fungal if requested	NGH (Mic)	Purulent specimens : Pus/Drain samples/ Aspirates/Exudates	Sterile Universal Container	Refer to Section 10.9.9 Pus samples, for specimen collection information	2 -14 working days
		Swabs: Abscess, ear, eye, mouth, nasal, pus, skin, ulcer, wounds (post-op & superficial)	Transport swab	Refer to Section 10.9.9 Swabs, for specimen collection information	2 -14 working days
		Tips: CVP or Hickman lines Central/arterial /portacath/ venous tips/ cannulae tip.	Sterile Universal Container	Refer to Section 10.9.9 IV Cannulae for specimen collection information	2 working days
		Tissue:	Sterile Universal Container	Do not use Formalin Refer to Section 10.9.9 Tissue/ Biopsies for specimen collection information	2 -14 working days
		Urine – MSU, CSU, Bag	Sterile Universal Container	Refer to Section 10.9.10 Urine, for specimen collection information Urinary antigens only with relevant clinical details. ICU and Liffey processed with no clinical details. Outside of routine hours, by Consultant approval only.	Microscopy 1 working day Neg Culture = 2 working days
CYFRA 21-1	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	15 working days
Cystatin C	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	15 working days






Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Cystic Fibrosis (Culture)	Tallaght Hospital (Microbiology)	Sputum	Sterile Universal Container	Refer to Section 10.9.4 Sputum for specimen collection information	Variable
Cystic Fibrosis (Genetic Testing) CFTR GENE	National Centre for Medical Genetics, Crumlin	Blood 2 x 2.7 mL EDTA tube		Form required with sample. https://media.childrenshealthireland.ie/ documents/consent- form-for-genetic- anlysis.pdf	Variable
Cyclosporin	St. Vincent's Hospital (Clinical Chemistry)	Blood 1 x 2.7 mL EDTA tube		None	15 working days
Cystine (Urine)	Eurofins Biomnis	Spot Urine sample in universal container.	Universal Container	10 mL Early Morning Urine (EMU) Fasting. Frozen < 1 hr.	15 working days
Cytotoxic Antibodies	Beaumont (Histocompatibility Lab)	Blood 1 x 4.9 mL Serum gel tube		Patient must be on transplant list	2- 3 working days
Dengue fever	NVRL	Blood 1 x 4.9 mL Serum gel tube		By prior arrangement only. Contact NVRL.	Variable
DCT	NGH (Blood Transfusion)	Refer to Direct Coombs Test			
D-Dimer	NGH (Haem)	Blood 1 x 3.0 mL Trisodium citrate tube		Testing must be complete within 8 hours of specimen collection. Specimen must be filled to line. Over or underfilled samples cannot be processed	1 working day







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Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Dehydro Epiandrosterone (DHEA) (Blood)	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube or 1 x 2.7mL EDTA tube or 1 x 2.7 mL Lithium heparin gel tube	  	Store at 4°C	15 working days
Dehydro Epiandrosterone (DHEA) (Urine)	Eurofins Biomnis	24 hr Urine collection	3L / 24 HR Urine Container	Plain container, No additive required. Refer min Vol 10 mls of full 24 hr collection. Refer to Section 2.5.	15 working days.
Dehydro Epiandrosterone Sulphate (DHEAS)	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube or 1 x 2.7mL EDTA tube or 1 x 2.7 mL Lithium heparin gel tube.	  	Store at 4°C	15 working days.
Deoxycortisol (11 Deoxycortisol compound S)	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube or 1 x 2.7 mL EDTA tube	 	Fresh morning sample. Store at 4°C.	15 working days
Dexamethasone Suppression Test	Tallaght Hospital (Clinical Chemistry)	See Cortisol above			


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Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Diazepam	Eurofins Biomnis	Blood 1 x 6 mL non gel Serum tubes only Standard serum tube cannot be used. Please request non- gel/red capped vacutainer serum tube from laboratory specimen reception		Spin, separate & freeze within 4 hours	15 working days
Digoxin/ Lanoxin	Tallaght Hospital (Clinical Chemistry)	Blood 1 x 2.7 mL Lithium heparin gel tube		Pre dose or 6-8 hours after last dose.	5 working days
Dihydropyrimidine dehydrogenase (DPD) deficiency /5- FU/ 5- flurouracial/ Fluoropyrimidines	Eurofins Biomnis	Blood 6 x 4.0 mL non gel li heparin tubes only Standard li heparin tube cannot be used. Please request non- gel/green capped vacutainer li heparin tubes from laboratory specimen reception.		Spin, separate and freeze 4 of the 6 samples into 2 tubes. Refer remaining 2 tubes as whole blood at 4°C Request form required at this link https://cdnmedia.eurofins.com/european-west/media/12148637/5fut-rqf-editable.pdf Any info not completed on this form will render the request unsuitable. Lab staff to record the times samples frozen and refrigerated.	15 working days
Dihydrotestosterone (DHT)	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube or 1 x 2.7mL EDTA tube or 1 x 2.7 mL Lithium heparin gel tube	  	Store at 4°C	15 working days
Diphtheria – <i>Corynebacterium diphtheriae</i>	Tallaght Hospital (Micro)	Throat swab	Transport swab	To be transported as soon as possible	Variable
Direct Coombs Test (DCT)	NGH (Blood Transfusion)	Blood 1 x 7.5mL EDTA tube		<u>Must</u> be accompanied by a pink transfusion request form.	4 hours








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Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
DNA paternity testing	Treoir	Refer to website	Refer to website	Available privately https://www.treoir.ie/information/establishing_paternity/DNA_testing	Variable
DNA (ds DNA, ss DNA)	Eurofins Biomnis	See anti DNA antibodies (ds DNA, ss DNA)			
Dopamine	Beaumont Hospital (Catecholamines Lab)	See Catecholamines			
Echinococcal Serology/ Hydatid Serology	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	10 working days
eGFR Estimated Glomerular Filtration Rate (done as part of U/E)	NGH (CC)	Blood 1 x 2.7 mL Lithium heparin gel tube		eGFR is calculated for all creatinine requests received in Clinical Chemistry NGH.	1 working day
<i>E.coli</i> 0157	Cherry Orchard	Faeces/Slope of organism (sent by NGH Micro lab)	Sterile Universal Container	For contact tracing and outbreaks/confirmation of suspect isolates.	7-10 working days
Electrophoresis (Serum) / SPEP	Tallaght Hospital (Clinical Chemistry)	Blood 1 x 4.9 mL Serum gel tube		Spin & Separate	10 working days
Electrophoresis (Urine) / Bence Jones protein (Urine)	Eurofins Biomnis	Spot Early Morning Urine in Universal container. Minimum volume 20 mls required	Universal Container	Refrigerate if delay in transporting to Lab	10 working days
ENA antibodies	Eurofins Biomnis	See Anti ENA antibody typing			
Endomysial/ Endomysium Antibodies (EMA)	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	15 working days





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Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Enteropathogenic <i>E. coli</i> (EPEC)	Cherry Orchard	Faeces/Slope of organism (sent by NGH Micro lab)	Sterile Universal Container	For contact tracing and outbreaks/ confirmation of suspect isolates.	7-10 working days
Enterobius vermicularis- (Pinworm)	Eurofins Biomnis	See Pinworm			
Enterovirus culture	NVRL	Faeces Respiratory secretion	Sterile Universal Container	Contact NVRL for specimen requirements	20 working days.
Enterovirus PCR	NVRL	Blood 1 x 7.5mL EDTA tube CSF, Faeces, Respiratory secretions Skin + Throat Swab, Vesicle swab	 Sterile Universal Container Viral Transport medium (VTM)	Send EDTA sample to NVRL same day, if not sending same day, spin separate and freeze	2-3 working days
Enterovirus PCR (CSF)	NGH (Mic)	See CSF for Virology			
Entyro/ Veduliuximab	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Spin, separate and freeze	20 working days
Epanutin	Tallaght Hospital (Clinical Chemistry)	See Phenytoin			
Epilim	Tallaght Hospital (Clinical Chemistry)	See Valproate			
Epstein Barr Virus (EBV) PCR	NVRL	Blood 1 x 2.7 mL EDTA tube and CSF	 Sterile Universal Container	Send EDTA to NVRL same day, if not sending same day spin, separate and freeze CSF testing for EBV DNA should only be performed in parallel with serology and DNA testing in blood.	2 working days








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Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Epstein Barr Virus (EBV) Serology (IgG, IgA)	NVRL	Blood 1 x 4.9 mL Serum gel tube		None	3 working days
Erythrocyte Sedimentation Rate (ESR)	NGH (Haem)	Blood 1 x 2.7 mL EDTA tube		None	1 working day
Erythropoietin (EPO)	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Spin, separate & freeze within 4 hours	15 working days
ESBL Screen	NGH (Mic)	Faecal/Rectal Swab Faeces	Red Topped Dual Swab Transport swab Sterile Universal Container	All wards need prior Consultant Microbiologist approval.	2-5 working days
Ethyl Glucuronide	Eurofins Biomnis	Urine sample	Universal Container	Freeze 2 ml aliquot of urine.	Variable
Ethylene Glycol	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Spin, separate & freeze within 4 hours. Refer in red stat bag.	2 working days
Fabry Disease (Alpha Galactosidase)	Willink Biochemical Genetics Unit, St. Mary's Hospital, Manchester.	Whole Blood 1 x 2.7 mL EDTA tube		Request form must be collected from the Clinical Chemistry Laboratory.	10 working days
Factor Assays (Coagulation)	Tallaght Hospital (Coagulation Lab)	See Coagulation factor assays			







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Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Factor V Leiden (Can be part of Thrombophilia screen).	Tallaght Hospital (Coagulation Lab)	Blood 2 x 2.7 mL EDTA and 2 x 3.0 mL Trisodium citrate tubes	 	Patient's anticoagulation status MUST be stated. Must be in NGH Lab by 9.30am if ordered as part of thrombophilia screen. If ordered on its own does not need to be in Lab by 9:30 am	12 weeks
Factor VII	Tallaght Hospital (Coagulation Lab)	Blood 2 x 3.0 mL Trisodium citrate tubes		Must be in NGH Lab by 9.30am. In consultation with Consultant Haematologist only. Patient's anticoagulation status MUST be stated.	12 weeks
Factor IX	Tallaght Hospital (Coagulation Lab)	Blood 2 x 3.0 mL Trisodium citrate tubes		Must be in NGH Lab by 9.30am. In consultation with Consultant Haematologist only. Patient's anticoagulation status MUST be stated.	12 weeks
Factor X	Tallaght Hospital (Coagulation Lab)	Blood 2 x 3.0 mL Trisodium citrate tubes		Must be in NGH Lab by 9.30am. In consultation with Consultant Haematologist only. Patient's anticoagulation status MUST be stated.	12 weeks
Factor XIII	NCHCD St James's Hospital	Blood 3 x 3.0 mL Trisodium citrate tubes		Must be in NGH Lab by 9.30am. In consultation with Consultant Haematologist only.	1 month







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Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Faecal Antigen	Eurofins Biomnis	See Helicobacter Pylori Antigen			
Faecal Calprotectin	Eurofins Biomnis	Faeces Minimum amount 20g	Sterile Universal Container	Refrigerate. Separate sample required if Culture & sensitivity also requested	15 working days
Faecal Elastase	Eurofins Biomnis	Faeces Minimum amount 20g	Sterile Universal Container	Sample should be well formed	15 working days
Faecal Occult Blood (FOB)		Faeces	Sterile Universal Container	NPT Testing to be arranged by requesting location. Pharmacy provide kits for internal NGH users only. Do not send samples to lab from internal or external requesting locations - refer directly to service provider.	
Faeces- GIT Infection- Seegene PCR ED & OPD only	NGH (Mic)	Faeces	Sterile Universal Container	Refer to section 10.9.11 Faeces for full list of Seegene targets analysed. Testing only performed on in- patients with approval of Consultant Microbiologist. Weekday testing only	3 working days
Familial Genetic Dementia and Neurodegenerative Diseases (Genetic Predisposition Testing)	CeGat Gmbh, Paul Ehrlich Str.23 72076 Tuebingen Germany	1 x 2.7 mL EDTA tube		Specific request form including patient consent required , available at following link https://cegat.com/wp- content/uploads/202 3/03/CeGaT_Order _Form_NDD.pdf	Variable







Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Familial Isolated Hypoparathyroidism (Genetic Test)	Department of Molecular Genetics, RILD Level 3, Royal Devon and Exeter NHS Foundation Trust, Barrack Road, Exeter, EX 2 5 DW.	1 x 2.7 mL EDTA tube and 1 x 7.5 mL EDTA tube	 	At least 8 ml EDTA sample stored at 4°C. Do not freeze. Transport at ambient temperature. Must be in Exeter within 5 days of venepuncture.	Variable
Farmers Lung (Aspergillosis)	Eurofins Biomnis	See Aspergillus Serology			
FBC (Full Blood Count)	NGH (Haem)	Blood 1 x 2.7 mL EDTA tube		None	1 working day
Ferritin Serum	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Request should include appropriate clinical details	5 working days
Felbamate (Felbatol)	Eurofins Biomnis	Blood 1 x 6 mL non gel Serum tubes only Standard serum tube cannot be used. Please request non-gel/red capped vacutainer serum tube from laboratory specimen reception		Spin, separate & freeze within 4 hours	15 working days
Fibrinogen	NGH (Haem)	Blood 1 x 3.0 mL Trisodium citrate tube		Specimen must be filled to line. Over or underfilled samples cannot be processed	1 working day.
Fibroblast Growth Factor – 23 /FGF23	Eurofins Biomnis	Blood 1 x 2.7 mL EDTA		Spin, separate & freeze within 1 hour	Variable






Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
FISH (Fluorescence In-Situ Hybridization). CLL probe.	Euofins Biomnis	Blood 1 x 2.7 mL EDTA tube and Blood 2 x 2.7 mL Lithium heparin gel tubes	 	In prior consultation with Consultant Haematologist Write test code MOHC2 on form	Variable
Flow Cytometry (CSF or Fluid)	Tallaght Hospital (Haematology)	CSF or Fluid	Sterile Universal Container	In prior consultation with Consultant Haematologist. Taken early morning and sent to Haem main lab.	2 working days
Flow Cytometry (Blood) Immunophenotyping	Tallaght Hospital (Haematology)	Blood 1 x 2.7 mL EDTA tube		In prior consultation with Consultant Haematologist. Taken early morning and sent to haem main lab. Mon- Thurs only	2 working days
Flow Cytometry (Bone Marrow)	Tallaght Hospital (Haematology)	Bone Marrow in RPMI	RPMI Media from Haem lab	In prior consultation with Consultant Haematologist. Taken early morning and sent to haem main lab	2 working days
Folate	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Request should include appropriate clinical details	6 working days





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Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Follicle Stimulating Hormone (FSH)	Tallaght Hospital (Clinical Chemistry)	Blood 1 x 2.7 mL Lithium heparin gel tube		None	5 working days
Fragile X	National Centre for Medical Genetics, Crumlin	Blood 2 x 2.7 ml EDTA tube		Special consent and request forms required- download from https://media.childrenshealthireland.ie/documents/consent-form-for-genetic-anlysis.pdf	Variable.
Free Androgen Index /FAI includes (SHBG + Testosterone) *Tesosterone by itself goes to Tallaght (Clin Chem) , but if requested with SHBG/FAI goes to Eurofins Biomnis	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	15 working days
Free Fatty Acids	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Spin, Separate and freeze within 1 hr.	10 working days
Free Light Chains(kappa, lambda)/SFLC	Tallaght Hospital (Clinical Chemistry)	Blood 1 x 4.9 mL Serum gel tube		Must be ordered with serum protein electrophoresis.	10 working days
Free T3 /Triiodothyronine/ FT3	Tallaght Hospital (Clinical Chemistry)	Blood 1 x 2.7 mL Lithium heparin gel tube		None	5 working days
Free T4 /Thyroxine/ FT4	NGH (CC)	Blood 1 x 2.7 mL Lithium heparin gel tube		None	2 working days





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Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Fructosamine	Eurofins Biomnis	Blood 1 x 2.7 mL Lithium heparin gel tube or 1 x 4.9 mL Serum gel tube or 1 x 2.7 mL EDTA tube	  	None	7 working days
Full blood count (FBC). Includes White Cell Count and Differential, Haemoglobin, Platelet Count, Red Cell Count and indices	NGH (Haem)	Blood 1 x 2.7 mL EDTA tube		None	1 working day
Functional Antibodies (Pneumococcal and Tetanus Antibodies)	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	15 working day
Fungal culture and microscopy (Mycology)	Eurofins Biomnis	Skin scrapings, Hair, Nail clippings	Sterile Universal Container	Refer to Section 10.9.16 Mycology, for specimen collection information.	5-21 working days
Gabapentin (Neurontin)	Eurofins Biomnis	Blood 1 x 6 mL non gel Serum tubes only Standard serum tube cannot be used. Please request non- gel/red capped vacutainer serum tube from laboratory specimen reception		Spin, separate & freeze within 4 hours	15 working days





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Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Galactomanan	Mycology Reference Laboratory. National Infection Services, PHE South West Laboratory, Science Quarter, Southmead Hospital, Bristol BS10 5 NB England Tel : 0117 4146222	Blood 1 x 4.9 mL Serum gel tube or BAL/Washings	 Sterile Universal Container	Specific request form required available at https://www.gov.uk/government/publications/diagnostics-myology-and-assays-referral-form	Variable
Galactose-1-phosphate uridylyltransferase (GALT)	Eurofins Biomnis	Blood 1 x 2.7 mL EDTA tube		None	20 working days
Alpha-Galactosidase (α-GAL)	Eurofins Biomnis	1 x 2.7 mL Lithium heparin gel tube		None	15 working days
(GGT) Gamma-glutamyltransferase	NGH (CC)	Blood 1 x 2.7 mL Lithium heparin gel tube		None	1 working day
Gastrin.	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube.		Patient should be fasting a minimum of 10 hours prior to collection. Spin, separate & freeze <1hr.	15 working days.
Genotyping	Eurofins Biomnis	See Karyotyping/ Chromosomal Analysis			
Gentamicin	NGH (Mic)	See Antibiotic Assays			
Giardia Lamblia Antigen	Eurofins Biomnis	Faeces (5g)	Universal Container	None	11 working days.
Glycine Receptor Antibodies	Eurofins Biomnis	CSF 1ml and/or Blood 1 x 4.9ml Serum gel tube	Universal Container 	None	3 weeks

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Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Glucose (Fasting)	NGH (CC)	Blood 1 x 2.7 mL Fluoride tube		8 hour fasting prior to collection	1 working day
Glucose (Non-Fasting)	NGH (CC)	Blood 1 x 2.7 mL Fluoride tube		None	1 working day
Glucose (Timed)	NGH (CC)	Blood 1 x 2.7 mL Fluoride tube		2 hours post meal	1 working day
Glucose (CSF)	NGH (CC)	CSF 1 x 2.7 mL Fluoride tube		Ensure concurrent blood glucose measurement	1 working day
Glucose (Fluid)	NGH (CC)	Fluid. 1 x 2.7 mL Fluoride tube		None	1 working day
Glucose 6 phosphate dehydrogenase (G6PD)	Eurofins Biomnis	Blood 1 x 7.5 mL EDTA tube		FBC result required.	7 working days
Gonorrhoea (Neisseria gonorrhoea) PCR	NGH (Mic) NVRL	See culture and sensitivity for genital swab APTIMA collection device kits. Tests for <i>Neisseria gonorrhoea</i> and <i>Chlamydia</i> <i>trachomatis</i> simultaneously. 3 types-vaginal swab; Unisex/endocervical swab; and urine.	Swab APTIMA collection device kit only. Kits available from NVRL – refer to www.nvrl.ucd.ie	None Ensure urine samples filled to the line i.e. not over/under filled and within expiry date. Use NVRL STI request form available at following link. https://nvrl.ucd.ie/sites/default/files/uploads/pdfs/LF_UM_001o_rev8_STI_Invstigation_Request_Form.pdf	3 working days 7 working days







Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Group and Antibody screen +/- Crossmatch	NGH (Blood Transfusion)	Blood 1 x 7.5 mL EDTA tube		Samples should be received before 15:45pm	4 hours
Growth Hormone	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Spin, separate & freeze within 4 hours.	15 working days
Growth Hormone Releasing Hormone (GHRH)	Eurofins Biomnis	Special Tube – EDTA + Aprotinin available from laboratory		Spin, separate & freeze within 4 hours. Include clinical information form. https://www.eurofins- biomnis.com/referentiel/liendoc/reseignements/INTGB/R48-INTGB-FRC_GHRH.pdf	10 working days
HbA1c (Glycosylated Haemoglobin)	NGH (CC)	Blood 1 x 2.7 mL EDTA tube		None	2 working days
Haematologic Malignancies e.g. NGS panel	Eurofins Biomnis	Blood 3 x 2.7 mL EDTA tube		In consultation with consultant haematologist only. Samples to be collected Mon and Tues only. Specific referral form required at the following link https://www.eurofin s- biomnis.com/referentiel/liendoc/reseignements/INTGB/B8-INTGB- Malignant_Blood.p df Send in separate red stat bag.	2-3 weeks







Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Haematinic screen (Vit B12, serum folate, ferritin)	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Request should include appropriate clinical details	6 working days
Haemochromatosis Carrier Status/ Diagnostic testing/HFE Genetics	Eurofins Biomnis	Blood 2 x 2.7 mL EDTA tubes		Eurofins Biomnis Genetic Test Request / Consent form required – download from https://www.eurofins .ie/media/1216201 4/genetic-test- request-option- 2.pdf	Variable
Haemoglobin Electrophoresis	St James's Hospital (Haematology Lab)	Blood 3 x 2.7 ml EDTA tubes (1 EDTA required for FBC at NGH) and 1 x 4.9 ml Serum gel tube (For ferritin to be referred to Eurofins Biomnis)	 	Sample to be referred from Haematology Lab NGH. Mon-Thurs only. Patient must be > 16 yrs of age. For patients < 16 yrs contact CHI at 01 4096929 for sample requirements.	Variable
Haemoglobinopathy screen		See Haemoglobin Electrophoresis above			

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Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Haemolytic Screen (Retic, DCT, LFT, LDH, Haptoglobin, Urinary Hemosiderin)	NGH (Haem, CC and Blood Transfusion) (Urinary Hemosiderin goes to St James's hospital/ haematology laboratory if urine received)	Blood 1 x 2.7 mL EDTA tube 1 x 7.5 mL EDTA tube 2 x 4.9 mL Serum gel tube 1 x 2.7 Lithium heparin gel tube and/or Urine (MSU) Universal Container	   Universal Container	If sending urine next day, store overnight at 4°C	Variable
Haemophilia Screen		Refer to Coagulation Factor Assays			
<i>Haemophilus influenzae</i> PCR-Biofire	NGH (Mic)	CSF 200 µL Blood Cultures	Sterile Universal Container Blood Culture bottles	Refer to Section 10.9 Blood Cultures and CSFs Biofire® is performed on certain Positive Blood cultures and all >6 White cell positive CSFs	As soon as possible from time of receipt of CSF / positivity of BC
Haemophilus influenzae typing	IMSRL Temple St.	Slope sent from NGH Micro Lab.	Chocolate Agar slope	For confirmation of suspect isolates	7-10 working days
Haptoglobin	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	Up to 7 working days






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Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
hCG + β (Human Chorionic Gonadotropin) (Tumour Marker)	Tallaght Hospital (Clinical Chemistry)	Blood 1 x 2.7 mL Lithium heparin gel tube		Provide appropriate clinical details. SPECIFY REQUEST IS 'TUMOUR MARKER REQUEST'.	5 working days.
hCG + β (Human Chorionic Gonadotropin) (Pregnancy)	NGH (CC)	1 x 2.7 mL Lithium heparin gel tube		SPECIFY REQUEST IS 'PREGNANCY REQUEST'. A separate Lithium Heparin sample is recommended.	< 2 hrs
Helicobacter Pylori Antigen/ Faecal Antigen	Eurofins Biomnis	Faeces-20g	Sterile Universal Container	Freeze sample in universal container.	5 working days
Helicobacter Pylori Serology/ Antibodies	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Refrigerated	4 working days
Helicobacter Pylori Culture (Gastric Biopsy).	Eurofins Biomnis	Gastric Biopsy	Special Agar: Portagen Media required - available from Eurofins by pre-order only.	Send biopsy in media protected from light	10 – 12 working days
Herbal Drugs.	HSE Drug Treatment Centre Trinity Court 31 Pearse St Dublin 2	Urine	Sterile Universal Container	None	Variable
Heparin induced Thrombocytopenia screen (HIT) (Pf antibody test, aggregation test, PF4, anti IgG, anti IgG, anti IgA and anti IgM)	St James's Hospital (Coagulation)	Blood 2 x 4.9 mL Serum gel tube		In consultation with Consultant Haematologist only. A 4T score must be filled out by the requesting clinician on the HIT Request Form. This form can be downloaded from https://www.stjames.ie/media/HIT%20request%20form%20(1).pdf 4T scores of 3 or less will not be tested. Must be in lab by 9:30 am Mon-Fri only.	PF antibody: test 1 working day. Platelet aggregation test : 2 weeks PF4 anti IgG, anti IgA and anti IgM : 2 weeks







LABORATORY USER MANUAL


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Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
21 Hydroxylase	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Spin, separate and freeze < 4 hrs.	15 working days
Hepatitis A-E serology (antibodies) (Also known as: HAV, HBV, HCV, H D/Delta Virus & HEV)	NVRL	Blood 1 x 4.9 mL Serum gel tube		Hepatitis D serology performed on all newly diagnosed HBsAg pos samples	2-3 working days Hep D+E: 10 working days
Hepatitis A PCR	NVRL	1 x 4.9 mL Serum gel tube Faeces	 Sterile Universal Container	By prior arrangement. Contact NVRL.	3 working days
Hepatitis B Core & Surface Antigen/ HBsAg	NVRL	Blood 1 x 4.9 mL Serum gel tube		Use NVRL request form at following link https://nvrl.ucd.ie/sites/default/files/uploads/pdfs/LF-UM-001n_v7_Blood_borne_virus_investigation_request_form.pdf	3 working days
Hepatitis B PCR/ Viral load/DNA	NVRL	1 x 2.7 mL EDTA tube		Send to NVRL same day. If not sending same day separate and freeze Use NVRL request form at following link https://nvrl.ucd.ie/sites/default/files/uploads/pdfs/LF-UM-001n_v7_Blood_borne_virus_investigation_request_form.pdf	5 working days
Hepatitis C PCR Viral load (HCV RNA Viral Load) Genotyping	NVRL	1 x 2.7 mL EDTA tube		Send to NVRL same day. If not sending same day separate and freeze	5 working days 10 working days








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Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Hepatitis C Virus (IL-28 SNP testing).	NVRL	1 x 2.7 mL EDTA tube		Send to NVRL same day. If not sending same day separate and freeze	10 working days
Hepatitis E PCR Viral load + genotyping	NVRL	Blood 1 x 4.9 mL Serum gel tube		By prior arrangement. Contact NVRL	10 working days
		or 1 x 2.7 mL EDTA tube			
HER 2	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Spin, separate and freeze within 4 hrs. Please supply menopausal status and clinical details with request.	14 working days
Herpes simplex virus (HSV) Serology	NVRL	Blood 1 x 4.9 mL Serum gel tube		None	3 working days
Herpes simplex culture	NVRL	Bronchoalveolar lavage Nasopharyngeal aspirate Urine Throat swab Other specimens by arrangement with NVRL	Sterile Universal container	None	14 working days
			Viral Transport Medium (VTM)		
Herpes simplex PCR	NVRL	CSF-500µl Urine Bronchoalveolar lavage	Sterile Universal Container	Use NVRL STI form available at the following link https://nvrl.ucd.ie/sites/default/files/uploads/pdfs/LF_UM_001o_rev8_STI_Inv estigation_Request_Form.pdf	2-5 working days
		or 1 x 2.7 ml EDTA tube			
		or Viral swab	Viral Transport Medium (VTM)		

LABORATORY USER MANUAL





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Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Herpes simplex virus 1 + 2 PCR (CSF)	NGH (Mic)	See CSF for Virology			
Herpesvirus Type 6 and 7 / HHV-6/HHV-7	NVRL	CSF-500µl Whole Blood 1 x 2.7 ml EDTA	Sterile Universal Container 	By prior arrangement. Contact NVRL	Variable
Histamine	Eurofins Biomnis	Blood 1 x 2.7 mL EDTA		Spin, separate, freeze within 4 hrs	10 working days
HIV (Human immunodeficiency virus) Serology Ag+Ab	NVRL	Blood 1 x 4.9 mL Serum gel tube		Use NVRL request form at following link https://nvrl.ucd.ie/sites/default/files/uploads/pdfs/LF-UM-001n_v7_Blood_borne_virus_investigation_request_form.pdf	2-3 working days
HIV PCR Viral Load/ HIV DNA/RNA	NVRL	Blood 1 x 2.7 mL EDTA		Send to NVRL same day. If not sending same day separate and freeze Use NVRL request form at following link https://nvrl.ucd.ie/sites/default/files/uploads/pdfs/LF-UM-001n_v7_Blood_borne_virus_investigation_request_form.pdf	7 working days
HIV Genotyping Resistance typing Tropism testing	NVRL	Blood 1 x 2.7 mL EDTA		Send to NVRL same day. If not sending same day separate and freeze Use NVRL form at following link https://nvrl.ucd.ie/sites/default/files/uploads/pdfs/LF-UM-001n_v7_Blood_borne_virus_investigation_request_form.pdf	20 working days





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Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
HLA Typing All types excluding HLA B27. For HLA B27 refer below	NBC (National Blood Centre)	Blood 2 x 2.7 mL EDTA tube or 1 x 7.5 ml EDTA tubes		To arrive in NBC within 48hrs of specimen collection	7 working days
HLA Antibodies		Blood 1 x 4.9 mL Serum gel tube			
HLA B27	NBC (National Blood Centre)	Blood 2 x 2.7 mL EDTA tube or 1 x 7.5 ml EDTA tubes		GP requests require a letter from a Consultant Rheumatologist. To arrive in NBC within 48hrs of specimen collection	7 working days
Homocysteine (Total only).	Eurofins Biomnis	Blood 1 x 2.7 mL Lithium heparin gel tube		Place on ice immediately after phlebotomy. Must be sent to lab on ice. Spin and separate within 15 mins. Despatch frozen sample.	7 working days
HTLV 1 and 2 (Human T- Lymphotropic Virus) Serology	NVRL	Blood 1 x 4.9 mL Serum gel tube		None	3 working days
HTLV 1 and 2 PCR	NVRL	Blood 2 x 2.7 mL EDTA tubes or 1 x 7.5 ml EDTA tubes		By prior arrangement only. Contact NVRL	Variable






Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Human herpesvirus 6 PCR (CSF)	NGH (Mic)	See CSF for Virology			
Human herpes virus type 8 / HHV8 / Kaposi sarcoma associated herpes PCR	NVRL	Blood 1 X 2.7 mL EDTA tube		Sent to Collindale for testing.	Variable
Human Papilloma Virus (HPV) Combined cytology and HPV screening option is only option available as per link provided to request form	Eurofins Biomnis	Cervical smear sample	Smear on slide	SEND SMEARS DIRECTLY TO EUROFINS BIOMNIS NOT VIA NGH LAB. Request form available from Eurofins Biomnis website https://cdnmedia.eu-rofins.com/europea-n-west/media/12160677/cytology-test-request-form-combo-tests.pdf Different payment options outlined on form.	4 weeks
Human parechovirus PCR (CSF)	NGH (Mic)	See CSF for Virology			
5 HIAA (5 Hydroxyindoleacetic Acid)	Beaumont Hospital (Catecholamine Lab)	24 hour urine collection	3L/ 24 Hr Urine container – Acidified	Additive required – 20 mls 6M HCL. Refer to section 2.5 No pineapple, nuts, bananas or kiwi fruit to be eaten immediately prior or during collection. Refer 20 mls of full 24 hr collection.	15 working days







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Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Hydroxyproline (Plasma)	Eurofins Biomnis	Blood 1 x 2.7 mL Lithium heparin gel tube		None	15 working days
Hypercoagulation Screen	Tallaght Hospital	See Thrombophilia Screen			
Hypocoagulation Screen	Tallaght Hospital	See Factor Assays			
IgG Subclasses (IgG 1- IgG4)	St James's Hospital (Immunology)	Blood 1 x 4.9 mL Serum gel tube		None	15 working days.
IgLon 5 antibodies	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube or CSF	 Universal Container	Mon- Wed only as needs to reach UK/Oxford within 72 hrs of collection	15 working days.
Immunoglobulins: IgA, IgG, IgM (gamma globulins)	Tallaght Hospital (Clinical Chemistry)	Blood 1 x 4.9 mL Serum gel tube		None	10 working days
Total IgE	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	10 working days.
IgE (Specific)	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Specific allergens must be stated – Requests for RAST/ allergy panels will not be referred.	10 working days.
IGHV (Immunoglobulin Heavy Chain Variable Gene)	St James's Hospital (Cancer Molecular Diagnostics Laboratory)	Whole Blood 2 x 2.7 mL EDTA tube		None	Variable





LABORATORY USER MANUAL






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Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Immunophenotyping (Blood)	Tallaght Hospital (Special Haematology Laboratory)	Whole Blood 1 x 2.7 mL EDTA tube		Request sent to Haematology lab for review as slides and form required. Mon – Thurs only. At room temperature (DO NOT PUT IN FRIDGE). If sending Thurs morning, send as early as possible. Sample must be <48 hrs old.	Variable
Infectious Mononucleosis Screen	NGH (Haem)	Blood 1 x 2.7 ml EDTA tube		Batched once daily.	1 working day
Influenza A and B serology	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	6 working days
Influenza virus Culture Immunofluorescence Resistance testing.	NVRL	Nasopharyngeal aspirate Sputum BAL	Sterile Universal Container	Respiratory viruses are thermo-labile. Transport to lab ASAP and keep at 4°C	2 working days
Influenza A + B PCR NGH patients only (Covid + RSV tested simultaneously on same swab)	NGH (Mic) In-patients only	Oronasopharyngeal/ nasopharyngeal swab in Viral Transport Media		Refer to section 10.9.17 Influenza testing. Performed on-site daily.	1 working day

Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Influenza virus PCR. H5/H7 Avian Influenza by prior arrangement only	NVRL	Nasopharyngeal aspirate or swab, Throat swab Nasal BAL	Viral Transport Medium (VTM) Sterile Universal container	Respiratory viruses are thermo-labile. Transport to lab ASAP and keep at 4°C	3-5 working days
Inflammatory Markers	Eurofins Biomnis	Blood 1 x 4.9ml Serum gel tube		None	15 working days
Infliximab (Antibodies and Level)/ Inflectra/Remicade	Eurofins Biomnis	Blood 1 x 4.9ml Serum gel tube		Please include patient's schedule e.g. dose, frequency of dose and commencement date of treatment.	15 working days
Inhibin B	Eurofins Biomnis	Blood 1 x 4.9ml Serum gel tube		Spin, separate & freeze within 1 hour. Non haemolysed sample. Always collect sample between 3 rd & 4 th day of cycle. Clinical details & ultrasound result required.	15 working days
Insulin	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Non-haemolysed samples. Refrigerated (If received as part of 72 hour fast for investigation of hypoglycaemia requires prior notification to Laboratory at 045 849911). First set of bloods must reach Lab on Mon excluding Bank Holidays or Tues only before 4 pm.)	15 working days





Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Insulin Antibodies	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Non-haemolysed samples. Refrigerated (If received as part of 72 hour fast for investigation of hypoglycaemia requires prior notification to Laboratory at 045 849911). Only 1 sample for Insulin antibodies to be referred during the entire test.	15 working days
Insulin Like Growth Factor (IGF-1)/ IGF-2/ IGF-1/IGF-2 Ratio/ Somatomedin C. Note: When requested with Growth Hormone (GH), a separate frozen serum is required for each test.	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Spin, separate & freeze < 4 hours. Non haemolysed sample. (If received as part of 72 hour fast for investigation of hypoglycaemia requires prior notification to Laboratory at 045 849911). First set of bloods must reach Lab on Mon excluding bank holidays or Tues before 4 pm.)	15 working days
INR (International Normalised Ratio)	NGH (Haem)	Blood 1 x 3.0 mL Trisodium citrate		Testing should be completed within 24 hours of specimen collection Specimen must be filled to line. Over or underfilled samples cannot be processed	1 working day
Interleukin 6 – IL-6	St James's Hospital (Immunology)	Blood 1 x 4.9ml Serum gel tube		Spin , Separate and freeze	5 working days
Intrinsic factor antibodies	Eurofins Biomnis	Blood 1 x 4.9ml Serum gel tube		None	Variable







Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Intrinsic Factors (Coagulation factors VIII, IX, XI, XII)	Tallaght Hospital (Coagulation Lab)	Blood 3 x 3.0 mL Trisodium citrate tubes.		Must be in NGH Lab by 9.30am. In consultation with Consultant Haematologist only.	12 weeks : unless deemed urgent by Consultant Haematologist
Iron (Fe)	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube or 1 x 2.7 mL Lithium heparin gel tube.	 	None	10 working days.
Islet Cell Antibodies	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	10 working days
Isoniazid	Antimicrobial Reference Lab, Pathology Sciences Building, Southmead Hospital, Westbury-On Trym, Bristol, BS10 SNB	Blood 1-2 ml Fluoride Oxalate tube	Sample available from TUH specimen reception by prior arrangement.	Take 2 hrs post dose Refer whole blood sample, unspun and unseparated to reach Bristol within 5 days of sample collection.	15 working days
JAK-2 (and associated mutations) includes: V617F JAK2 exon 12 CALR MPL sequencing Also known as MPN panel	St James's Hospital (Cancer Molecular Diagnostics Laboratory)	Blood 3 x 2.7 m L EDTA tubes		In consultation with Consultant Haematologist only. CMD Request form required. Please select correct form at the following link https://www.stjames.ie/media/Cancer%20Molecular%20Diagnostics%20request%20form%20v7.pdf	2-3 weeks
JC Polyomavirus/ Anti John Cunningham viral antibodies	NVRL	Blood 1 x 4.9 mL Serum gel tube		None	2-3 weeks






Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Karyotyping/ Chromosomal Analysis (In-Patients Only).	Eurofins Biomnis	Blood 2 x 2.7 mL Lithium Heparin gel tube		NGH only accept from hospital inpatients. Send Mon –Wed. Must get to Eurofins Biomnis by 2pm same day. Must be received with the combined genetic test request /consent form available at following link https://www.eurofins.ie/media/12162014/genetic-test-request-option-2.pdf Send in red Biomnis stat bag.	Variable
Keppra Levels (Levetiracetam)	Eurofins Biomnis	See Levetiracetam			
Kleihauer Test	Eurofins Biomnis	Blood 2 x 2.7 ml EDTA		None	8 working days
Lacosamide /Vimpat	Eurofins Biomnis	Blood 1 x 6 mL non gel Serum tubes only Standard serum tube cannot be used. Please request non-gel/red capped vacutainer serum tube from laboratory specimen reception		Spin, separate and freeze within 4 hrs.	15 working days
Lactate Arterial/Venous Note: Interference may be noted in cases of Ethylene glycol/antifreeze poisoning.	NGH Blood Gas Analysers (Inpatient only)	Radiometer safePICO Blood Gas Syringe: Sample Volume: 1 mL		Analyse within 15 mins Hand deliver to Laboratory – do not send sample in PTS (Chute) system	Assayed on receipt







Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Lactate (plasma) Note: see above Inform requester of availability via Blood Gas Analysis	Tallaght Hospital (Clinical Chemistry)	Blood 1 x 2.7 mL Fluoride tube		Contact the laboratory prior to taking specimen for plasma Lactate analysis. Spin and separate < 15 mins. Send to Tallaght Hospital immediately.	1 working day
Lactate (CSF)	Tallaght Hospital (Clinical Chemistry)	CSF taken into Fluoride tube		Contact the laboratory prior to taking specimen for CSF Lactate analysis. Send to Tallaght Hospital immediately. <i>Do not spin or freeze.</i>	1 working day
Lactate dehydrogenase (LDH)	NGH (CC)	Blood 1 x 4.9 mL Serum gel tube		Non – haemolysed samples	1 working day
Lactate dehydrogenase (LDH) (Fluid)	NGH (CC)	Fluid in Universal container. Minimum volume 2 mls required.	Universal Container	None	1 working day
Lactate dehydrogenase (LDH Isoenzymes).	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Non haemolysed sample	1 working day
Lactose	Eurofins Biomnis	Whole Blood 2 x 2.7 mL EDTA tubes or 1 x 7.5 mL EDTA tube		None	1 month



LABORATORY USER MANUAL






Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Lamotrigine/ Lamictal	Eurofins Biomnis	Blood 1 x 6 mL non gel Serum tubes only Standard serum tube cannot be used. Please request non- gel/red capped vacutainer serum tube from laboratory specimen reception		Spin, separate & freeze within 4hrs	15 working days
Lead (Blood)	Eurofins Biomnis	Whole Blood 2 x 2.7 mL EDTA tubes		Whole Blood. Do not separate.	7 working days
Lead (Urine)	Eurofins Biomnis	Spot urine in Universal container. Minimum volume 20 mls required	Universal Container	End of working shift urine.	15 working days
Legionella Serology	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Confirmatory serology performed if initial screening pos	5-14 working days
Legionella PCR	Eurofins Biomnis	Sputum BAL Puncture fluid	Sterile Universal Container	None	5 working days
Legionella Urinary Antigen (Atypical pneumonia)	NGH (Mic)	Urine 10 mls	Sterile Universal Container	Only with relevant clinical details. Outside of routine hours, by Consultant approval only.	1 working day
Leptospira Serology (Weils's disease)	NVRL	Blood 1 x 4.9 mL Serum gel tube		None	4 working days



Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Levetiracetam (Keppra Levels).	Eurofins Biomnis	Blood 1 x 6 mL non gel Serum tubes only Standard serum tube cannot be used. Please request non- gel/red capped vacutainer serum tube from laboratory specimen reception		Spin, separate & freeze within 4 hours.	15 working days
LH (Luteinising Hormone)	Tallaght Hospital (Clinical Chemistry)	Blood 1 x 2.7 mL Lithium heparin gel tube		None	5 working days
Lipase	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube or 1 x 2.7 mL Lithium heparin gel tube	 	None	15 working days
Lipoprotein electrophoresis (Lipids electrophoresis)	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Non haemolysed sample. Fasting sample.	15 working days
Lipoprotein Lp(a)	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	15 working days
<i>Listeria monocytogenes</i> PCR-Biofire	NGH (Mic)	CSF 200 µL Blood Cultures	Sterile Universal Container Blood Culture bottles	Refer to Section 10.9 Blood Cultures and CSFs Biofire®is performed on certain Positive Blood cultures and all >6 White cell positive CSFs. Other requests on approval by Consultant Microbiologist only.	As soon as possible from time of receipt of CSF / positivity of BC





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Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Lithium	NGH (CC)	Blood 1 x 4.9 mL Serum gel tube		Take 12 hours post dose or before next dose if BD dosing.	1 working day
Lupus Anticoagulant (Can be part of Thrombophilia screen)	Tallaght Hospital (Coagulation Lab)	Blood 3 x 3 mL Trisodium citrate tubes and 1 x 4.9mL Serum gel tube	 	Patient's anticoagulation status + recent thrombotic events MUST be stated on request form. Must be fresh and be in lab in NGH by 9.30 am. Will not be analysed if INR >3.0. Not performed if patient is on Direct Oral Anticoagulants (DOAC's), heparin or Clexane. Patient must be off DOACs, Heparin or clexane for 48hrs before sample collected. Request to be reviewed by Haematology Laboratory Scientist.	12 weeks : unless deemed urgent by Consultant Haematologist
Lupus Screen.	Eurofins Biomnis	See Anti-Nuclear Antibodies (ANA)			
Lyme Disease (<i>Borrelia burgdorferi</i>)	NVRL	CSF 400 µL and/or Blood 1 x 4.9 mL Serum gel tube (must be taken same day or within 1 day either side of CSF)	Sterile Universal Container 	Clinical details must be provided for confirmatory testing. If molecular testing required contact NVRL on 01- 7164418	5 working days
Lymphocyte Subsets : B and T cell subsets	St James's Hospital (Immunology)	Blood 2 x 2.7 mL EDTA tube		None	4 working days

Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Lysosomal Enzyme Activity	Willink Biochemical Genetics Laboratory Manchester Centre for Genomic Medicine, 6 th floor, Saint Mary's Hospital, Manchester University NHS Foundation Trust, Oxford Road, Manchester M13 9WL	Blood 2 x 2.7 mL EDTA tube		Samples can be taken Mon-Wed only as Samples must arrive in Manchester < 72 hrs after collection.	15 working days
MAG (Myelin associated glycoprotein) antibodies	Eurofins Biomnis	Blood 1 x 2.7 mL Serum gel tube		None	28 working days
Manganese	Eurofins Biomnis	Blood 1 x 6 mL non gel Serum tubes only Standard serum tube cannot be used. Please request non-gel/red capped vacutainer serum tube from laboratory specimen reception		Spin and separate.	15 working days
Malaria Parasites	NGH (Haem)	Blood 1 x 2.7 mL EDTA tube		Contact Lab for special request form. Send fresh without delay.	1 working day.
Marfan Genetic Screening	National Centre for Medical Genetics, Crumlin	Blood 1 x 2.7 mL EDTA tube		Referred to clinical genetics team at Crumlin for decision re referral.	Variable
Magnesium (Blood)	NGH (CC)	Blood 1 x 2.7 mL Lithium heparin gel tube		None	1 working day
Magnesium (Urine)	Eurofins Biomnis	24 hr urine collection	3 L/24 hr urine container	20 mls 6M HCL additive required. 5 ml aliquot of 24 hr collection referred. Label as 24 hr aliquot	4 working days



Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Measles Serology	NVRL	Blood 1 x 4.9 mL Serum gel tube		Request form at following link. Change sample type to serum LFUM001m.xlsx (ucd.ie).	Daily Mon-Fri Saturday and Sunday by triggering the out of hours service – see https://nvrl.ucd.ie/ and pg. 76 of this document
		Oracol fluid (IgM antibody detection only).	Oracol Swabs available from NVRL or Microbiology lab NGH	Request form available at following link LFUM001m.xlsx (ucd.ie).	Mon-Sat if in NVRL pre 9:30 am
Measles Virus PCR	NVRL	Oral fluid (IgM antibodies also tested on Oracol swab).	Oracol Swabs available from NVRL or Microbiology lab NGH	Request form available at following link LFUM001m.xlsx (ucd.ie)	Monday- Saturday Same day result if sample received at NVRL pre- 09:30h Same day results Mon- Fri if received at NVRL pre 9:30 am
		and Blood 1 x 4.9 mL Serum gel tube Oral fluid in Oracol swab is specimen of choice as samples in VTM samples are not suitable for IgM antibody detection or Throat Swab (Measles RNA detection only)	and  VTM or UTM	For serum sample please use same request form but change sample type	




Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
CHROMOcocca l PCR-Biofire (<i>Neisseria meningitis</i>)	NGH (Mic)	CSF 200 µL Blood Cultures	Sterile Universal Container Blood Culture bottles	Refer to Section 10.9 Blood Cultures and CSFs Biofire@is performed on all Positive Blood cultures and >6 White cell positive CSFs	1 working day
Meningococcal PCR	Temple Street Children's Hospital	Blood 1 x 2.7 mL EDTA		IMSRL form required at following link https://media.childrenshealthireland.ie/documents/IMSRL-Request-Form-Jul-2022.pdf	3 working days
Men 1 Genetic Testing (Multiple Endocrine Neoplasia Type 1).	National Centre for Medical Genetics, Crumlin	Blood 2 x 2.7 mL EDTA tube		Form required with sample	Variable
Mercury (Blood)	Eurofins Biomnis	Whole Blood 2 x 2.7 mL EDTA tube or Whole Blood 2 x 2.7 mL Lithium heparin gel	 	Whole Blood	21 working days
Mercury (Urine)	Eurofins Biomnis	Spot Urine- Min 20 mls	Universal Container	Sample at end of workshift.	21 working days
Methadone	National Drug Treatment Centre 30-31 Pearse Street, Dublin 2	Blood 1 x 4.9 mL Serum gel tube Urine – Refer to Toxicology Screen (Urine) below		Take sample immediately before dose on day 4 after supervised methadone consumption for previous 3 days	5 working days






Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Metanephrines (Plasma Free Metanephrines)	Beaumont (HPLC Lab)	Blood 2 x 2.7 mL EDTA tubes or 1 x 7.5 mL EDTA tube		Patient should lie down for 30 mins before taking sample. Caffeine free diet recommended 24 hrs prior to venesection. State the medication the patient is on. Place sample on ice pack while transporting. Separate and freeze. Test of choice for the investigation of Phaeochromacytoma or Paraganglioma	15 working days
Metanephrine (Urine)	Beaumont Hospital (Catecholamines Lab)	24 hr Urine collection.	3L/ 24 hr Urine container	Additive required 20 mL 6M HCL. Refer min 20 mls of full 24 hr collection. Label as 24 hr aliquot	15 working days
Metapneumovirus Human (HMPV) Immunofluorescence	NVRL	BAL NPA Sputum	Sterile Universal Container	None	3 working days
Metapneumovirus Human (HMPV) PCR	NVRL	BAL NPA Sputum Throat swab	Sterile Universal container Virus transport media	None	3 working days
Meth Haemoglobin (MetHb) Arterial/Venous	NGH Blood Gas Analysers (Inpatient only)	Radiometer safePICO Blood Gas Syringe: Sample Volume: 1 mL		Analyse within 15 mins Hand deliver to Laboratory – do not send sample in PTS (Chute) system.	Assayed on receipt







Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Methylmalonic Acid (MMA)	Eurofins Biomnis	Blood 1 x 4.0 mL non gel li heparin tubes only Standard li heparin tube cannot be used. Please request non-gel/green capped vacutainer li heparin tube from laboratory specimen reception.		Spin, separate & freeze within 1 hour.	15 working days
Microalbumin	NGH (CC)	See Albumin Creatinine Ratio/ACR			
Microarray Genetic Testing	Crumlin (National Centre for Medical Genetics)	Blood 2 x 2.7mL EDTA tube		Form and consent required at following link https://media.childrenshealthireland.ie/documents/consent-form-for-genetic-anlysis.pdf	Variable
Microbial Identification 16S DNA PCR Refer to 16S r RNA (Ribosomal RNA)	Bacteriology Reference Department, 61 Colindale Avenue, London NW9 5HT	Any isolate or sample	Any isolate or sample	Contact Consultant Microbiologist Specific request form (X: Lab/Spec Reception/ Spec Recp worksheets) needs to accompany sample	Variable
MODY Gene Analysis (Maturity Onset Diabetes of the Young)	Department of Molecular Genetics, Level 3 RILD building, Royal Devon & Exeter NHS Trust, Barrack Road, Exeter, EX2 5DW, UK.	Blood 2 x 2.7mL EDTA tube		Form required at following link https://www.diabetesgenes.org/genetic-test-referral-forms/	Variable
MOG antibodies (Myelin oligodendrocyte glycoprotein) antibodies	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube CSF 300 µL	 Universal Container	None	28 working days

LABORATORY USER MANUAL






Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Molluscum Contagiosum /Poxvirus	NVRL	Skin or vesical fluid	Skin scapings or fluid in universal container	Discuss with NVRL clinical team before sending sample	Variable
Monkey Pox (MPX)	NVRL	Viral swab of Cutaneous lesion, ulcer or Vesicular fluid/throat swab	 Viral Transport medium	Referring Clinician to inform Consultant Microbiologist and NVRL (Category A packaging for Eurofins Courier)	2 working days
MRSA	NGH (Mic)	MRSA screen = Nasal, Groin and Throat Swabs only	Transport Swab	None	2 working days
Mumps Virus Serology (Blood)	NVRL	Blood 1 x 4.9 mL Serum gel tube		None	5 working days
Mumps Virus PCR	NVRL	CSF Urine Throat swab Oral Fluid	Sterile Universal container Virus Transport Media Oracol Swabs available from NVRL or Microbiology lab NGH	None	7 working days
Mumps Virus Culture	NVRL	Urine, Oral Fluid Throat swab	Sterile Universal Container Oracol Swabs available from NVRL or Microbiology lab NGH Virus Transport Media	None	5 working days



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Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Mycobacteria (Zn, AFB, TB)	Tallaght Hospital (Microbiology)	See Acid Fast Bacilli (AFB)			
Mycology	Eurofins Biomnis	See Fungal Culture and Microscopy			
Mycophenolate	Eurofins Biomnis	Blood 1 x 2.7 mL EDTA tube		None	15 working days
Mycoplasma Pneumonia Serology	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	3-4 working days.
Mycoplasma Pneumonia Culture	Eurofins Biomnis	Genital swabs – urethral, endocervical, vaginal, Urine	Virus Transport Media Universal Container	Transport liquid samples at 4 degrees	15 working days
Mycoplasma <i>Screen</i>	Eurofins Biomnis	CSF or bronchial washing/ lavage	Universal Container	Freeze (CSF or washing) on receipt	20 working days
Mycoplasma Genitalium	NVRL	APTIMA collection device kits	APTIMA collection device kit only	Kits available from NVRL – refer to www.nvrl.ucd.ie . Ensure urine specimen containers are filled to the correct volume and are not past expiry date stated. Use NVRL STI request form available at following link https://nvrl.ucd.ie/sites/default/files/uploads/pdfs/LF_UM_001o_rev8_STI_Investigation_Request_Form.pdf	10 working days.
Myositis Panel (Anti TIFY, MDA 5, NXP2, SAE, Anti KU, PM100, PM75, JO-1, SRP, PL7, PL12, EJ, OJ and anti subunits Mi2a and Mi2beta).	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	20 working days







Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Myoglobin (Serum)	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube or 1 x 2.7 mL Lithium heparin gel tube	 	None	15 working days
Myoglobin (Urine): Please return complete collection between 8:30 am and 5:30 pm Mon – Fri or 9am – 1 pm Sat	Eurofins Biomnis	Urine in Universal container or 24hr Urine sample in 3L container.	Universal Container or 3L/24 hr Urine Container	2mls of 24hr or 2 mls random urine sample frozen <1hr	15 working days
Natural Killer Cell Assay (NK cells)	St James's Hospital (Immunology)	See Lymphocyte Subsets.			
Needle Stick Injuries (Source and Recipient blood)	NVRL ED to be contacted immediately (Follow PPPG- 362 guidelines on Q pulse) Out of hours- External locations need to contact NVRL directly.	Blood 1 x 4.9 mL Serum gel tube		It is the Requesting Clinicians' responsibility to contact NVRL out-of-hours. See www.nvrl.ucd.ie Source blood always sent urgently during routine and out- of-hours.	Same Day (If NVRL approved prior to sending)
Neisseria Gonorrhoea	NVRL	See Gonorrhoea			
Neuron Specific Endolase	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Spin, separate & freeze within 4 hours	15 working days
Nitrazepam	Eurofins Biomnis	Blood 1 x 6 mL non gel Serum tubes only Standard serum tube cannot be used. Please request non- gel/red capped serum tube from laboratory specimen reception		Spin, separate & freeze within 4 hours	15 working days









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Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Noradrenaline	Beaumont	See Catecholamines			
Norovirus PCR (Winter vomiting) In-house samples	NGH (Mic)	Faeces	Sterile Universal Container	With prior approval only.	Same day
Norovirus PCR (Winter vomiting) External locations	NVRL	Faeces 5-10 g	Sterile Universal Container	Separate sample required. Early acute specimens.	5 working days
Notch 3 Notch 3 exons 3-24 or Notch 3 6 exons	Eurofins Biomnis	Blood 2 x 2.7 mL EDTA tube.		Consent form required at following link https://www.eurofins .ie/media/1216201 4/genetic-test- request-option- 2.pdf Samples to reach Biomnis early am.	20 working days
5- Nucleotidase	Eurofins Biomnis	1 x 4.9 mL Serum gel tube		None	15 working days
NT-proBNP	NGH (CC)	Blood 1 x 2.7 mL Lithium heparin gel tube or 1 x 4.9 mL Serum gel tube	 	None	1 working day
Occult Blood		See Faecal Occult Blood			
Oestradiol/Oestr ogen	Tallaght (Clinical Chemistry)	Blood 1 x 2.7 mL Lithium heparin gel tube		None	5 working days
Olanzapine (Zyprexa)	Eurofins Biomnis	Blood 1 x 4.9 mL non gel li heparin tubes only Standard li heparin tube cannot be used. Please request non- gel/green capped vacutainer li heparin tube from laboratory specimen reception.		Spin, Separate & freeze within 4 hours	15 working days





LABORATORY USER MANUAL





Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Oligoclonal bands.	St James's Hospital (Immunology)	See CSF for Oligoclonal Bands.			
Osmotic Fragility	Eurofins Biomnis	Whole Blood 2 x 2.7 mL EDTA tubes		Whole blood. Include FBC and Reticulocyte results	7 days
Osteocalcin	Eurofins Biomnis	1 x 4.9 mL Serum gel tube		Spin, separate & freeze within 1hr	15 working days
Organic Acids (Urine)	Metabolic Laboratory, Children's University Hospital, Dublin 1.	Early Morning Urine (EMU). 5ml min volume	Sterile Universal Container	Dipstick for pH and freeze immediately . pH should be less than 8. If > 8? microbial contamination, Request repeat sample. Dispatch frozen sample.	7 working days
Osmolality	Tallaght Hospital (Clinical Chemistry)	Blood 1 x 4.9 mL Serum gel tube or 1 x 2.7 mL Lithium heparin gel tube	 	None	5 working days
Osmolality (Urine)	Tallaght Hospital (Clinical Chemistry)	Spot Urine- min volume 5 ml	Universal Container	Cannot be requested with any other urinary investigation e.g. C/S.	5 working days
Osteocalcin	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Spin, separate & freeze within 1hr	15 working days




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Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Ova and Parasites	Eurofins Biomnis	Faeces (Additional sample if C/S also required).	Sterile Universal container	Refer to section 10.9.14 Ova and Parasites. Must include relevant clinical details. In-patients can be processed molecularly on-site if prior approval with Consultant Microbiologist. Enteric Biofire® PCR targets include; <i>Cryptosporidium;</i> <i>Cyclospora cayetanensis;</i> <i>Entamoeba histolytica;</i> and <i>Giardia lamblia.</i>	5 working days
Oxalate (Oxalic Acid)	Eurofins Biomnis	24 hr Urine collection	3 L/24 hr acidified urine container.	Additive required 20 mL 6M HCL. Refer 20 mls from entire 24 hr collection.	15 working days
Oxcarbazepine (trileptal)	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Spin, separate & freeze within 1 hour	15 working days
Paracetamol	NGH (CC)	See Acetaminophen			
Paraneoplastic neurological syndrome markers: Hu, Yo, Ri, Recoverin, Ta, Ma, PNMA2, CRMP5/CV2, Tr (DNER) /Zic4, Sox1 Amphiphysin. Titin, GAD65	St James's Hospital (Immunology)	Blood 1 x 4.9ml Serum gel tube		None	2 – 3 weeks (Frequency of analysis every 2wks)
Parainfluenza virus (PIV) Immunofluorescence	NVRL	Nasopharyngeal aspirate or washing BAL Sputum	Sterile Universal Container	Respiratory viruses are thermo-labile. Must be sent to lab ASAP and kept at 4°C	3 working days










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Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Parainfluenza virus (PIV) culture	NVRL	Respiratory secretions Throat swab	Sterile Universal Container Virus Transport Media	Respiratory viruses are thermo-labile. Must be sent to lab ASAP and kept at 4°C	14 working days
Parainfluenzae 1,2,3 Serology	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube.		Refrigerated	5 working days.
Parathyroid Hormone (PTH)	Tallaght Hospital (Clinical Chemistry)	Blood 1 x 2.7 mL EDTA tube		None	5 working days
Parathormone Related Protein (PTH-RP)/ Fractionated PTH	Eurofins Biomnis	Aprotinine (as used for ACTH) Special tube (EDTA+ Aprotinine) pink in colour supplied upon request from lab		Spin, separate and freeze immediately	15 working days
Parvovirus B19 <u>PCR/DNA</u> Slapped cheek viral detection	NVRL	Blood 1 x 2.7 mL EDTA tube or Amniotic fluid	 Sterile Universal Container	Send to NVRL same day , if not sending same day, spin, separate and freeze EDTA sample	5 working days.
Parvovirus B19 Serology/Slapped Cheek	NVRL	Blood 1 x 4.9 mL Serum gel tube		None	3 working days
PH in Pleural Fluid	NGH (CC)	Fluid in Radiometer Blood Gas syringe - Referred to Laboratory for analysis		Analyse within 15 mins Hand deliver to Laboratory – do not send sample in PTS (Chute)	1 working day

Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Phenobarbital	Tallaght Hospital (Clinical Chemistry)	Blood 1 x 2.7 mL in Lithium heparin gel tube		None	5 working days
Phenylalanine	Temple Street Children's Hospital	Blood 1 x 2.7 mL Lithium heparin gel tube		Separate prior to dispatch to CUH, Temple Street.	1 – 3 working days
		or 1 x 4.9 mL Serum gel tube			
Phenytoin (Epanutin)	Tallaght Hospital (Clinical Chemistry)	Blood 1 x 2.7 mL Lithium heparin gel tube		Sampling pre-dose is recommended.	5 working days
Phosphate (Blood)	NGH (CC)	Blood 1 x 2.7 mL Lithium heparin gel tube		Non-haemolysed sample	1 working day
Phosphate (Urine)	NGH (CC)	24 hr Urine collection	3L/ 24 hr Acidified Urine Container	Additive required 20 mL 6M HCL. 5 ml aliquot from full 24 hr collection used for analysis.	1 working day
Phosphatidylethanol/ PEth	Eurofins Biomnis	Blood 2 x 2.7 mL EDTA tube		None	2- 3 weeks
Phospholipase A2	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	12-15 working days
Phosphorylated Tau/Phospho Tau	St James's Hospital (Immunology)	CSF- 4 mls, taken into separate polypropylene tube – available from laboratory prior to sampling and not used for C&S/Cell Count		Assayed Mon-Fri only. Dispatch immediately on receipt. Phone 01 4162925 prior to dispatch. Sample must arrive at St James's within 2 hrs of collection and at latest 4 pm so must be taken early in the day.	1-2 working days









Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Picornavirus (Coxsackie Virus Serology)	Eurofins Biomnis	See Coxsackie Virus Serology			
Pinworm (Enterobius v Vermicularis)	Eurofins Biomnis	Sellotape slides	Slide	Refer to Section 10.9.14 for details on sampling	3 working days
Placental Alkaline Phosphatase	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	15 working days
Plasma Viscosity	St James's Hospital (Haematology Lab)	Blood 1 x 2.7 mL EDTA tube		None	2 working days
Plasminogen Activator Inhibitor Type 1 /PAI-1	NCHCD, St James's Hospital (Sent to Royal Free Hospital, London)	Blood 2 x 3.0 mL Trisodium citrate tubes		Clinical details required. Referral requires consent from Consultant Haematologist. Must be in lab by 9:30 am Mon-Fri only	Variable
Pneumococcal Antibodies	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	15 working days
Pneumococcal Urinary Antigen (Atypical pneumonia)	NGH (Mic)	Urine	Sterile Universal Container	Only with relevant clinical details. Outside of routine hours, by Consultant approval only.	1 working day
Pneumococcal PCR-Biofire (<i>Streptococcus pneumoniae</i>)	NGH (Mic)	CSF 200 µL Blood Cultures	Sterile Universal Container Blood Culture bottles	Refer to Section 10.9 Blood Cultures and CSFs Biofire® is performed on certain Positive Blood cultures and all >6 White cell positive CSFs	As soon as possible from time of receipt of CSF / positivity of BC



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Pneumococcal PCR (<i>Streptococcus pneumoniae</i>)	Temple Street Children's Hospital	Blood 1 x 2.7 mL EDTA		IMSRL form required IMSRL form required at following link https://media.childrehealthireland.ie/documents/IMSRL-Request-Form-Jul-2022.pdf	3 working days
Pneumocystis Carinii /jiroveci Pneumonia /PCP	NVRL	BAL Bronchial secretions CSF	Sterile Universal Container	Min 5 ml Refrigerated	4 working days
PNH Screen/ PNH Immunophenotyping	Tallaght Hospital (Haematology Lab)	Blood 2 x 2.7 mL EDTA tube		Refer request to Haematology Dept for immunophenotyping form and transfusion history	5 working days
Polio Virus (Culture)	NVRL	Faeces	Universal Container	None	10 working days.
Polio Virus (Serology)	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	15 working days
POMPE Disease (GAA: acid alpha- glucosidase)	Willink Biochemical Genetics Unit, St. Mary's Hospital, Manchester	Blood 1 x 2.7 mL EDTA tube		Appropriate request form must be collected from Clinical Chemistry laboratory.	15 working days
Porphobilinogen (PBG)	St James's Hospital (Biochemistry Dept)	Urine: Early morning spot urine in Universal container	Universal Container	Protect From Light	15 working days





Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Porphyrin Screen	St James's Hospital (Biochemistry Dept)	Urine: Early morning spot urine in Universal container	Universal Container	Protect From Light	15 working days
		and/or			
		Faeces: 10 g in Universal container	Universal Container	Protect From Light	
		and/or			
		Whole Blood: 1 x 2.7 mL EDTA tube		Whole Blood Protect from light	
		and/or			
		Blood: 1 x 2.7 mL Lithium heparin gel tube		Protect from light before and after sample separation All samples should be referred ASAP by Taxi. If samples are not received in lab light protected cover immediately and record this on request form. Specific Request form required at the following link https://www.stjames.i e/media/Porphyrin%2 0Request%20Form.pd f	
Posaconazole	Eurofins Biomnis	Blood 1 x 6 mL non gel Serum tubes only		Spin, separate and freeze	15 working days
		Standard serum tube cannot be used. Please request non- gel/red capped vacutainer serum tube from laboratory specimen reception			



Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Potassium	NGH (CC)	Blood 1 x 2.7 mL Lithium heparin gel tube		Non Haemolysed sample	1 working day
Prader Willie Syndrome	Eurofins Biomnis	1 x 2.7 mL Lithium heparin gel tube and 2 x 2.7 mL EDTA tube	 	Form to be printed from biomnis website. Parental blood sample may also be required.	Variable
Prealbumin	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Specify patient's age and gender.	15 working days
Preglobulin	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Spin, separate & freeze within 4 hours	15 working days
Primidone /Mysoline	Eurofins Biomnis	Blood 1 x 6 mL non gel Serum tubes only Standard serum tube cannot be used. Please request non- gel/red capped vacutainer serum tube from laboratory specimen reception		Spin, separate & freeze within 4 hours	15 working days
Prion Protein / CJD	Beaumont Hospital (Neuropathology Lab)	See CJD above			
Procalcitonin	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Spin, separate & freeze within 1 hour.	15 working days
Procollagen III /P1NP	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Spin, separate & freeze within 4 hours	15 working days
Progesterone	Tallaght Hospital (Clinical Chemistry)	Blood 1 x 2.7 mL Lithium heparin gel tube.		None	5 working days





LABORATORY USER MANUAL




Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Pro Insulin	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Spin, separate & freeze within 1 hour. (If received as part of 72 hour fast for investigation of hypoglycaemia requires prior notification to Laboratory at 045 849911). First set of bloods must reach Lab on Mon excluding Bank Holidays or Tues only before 4 pm.)	15 working days
17 Hydroxy Progesterone	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube or 1 x 2.7 mL Lithium heparin gel tube or 1 x 2.7 mL EDTA tube	  	Specify the age, gender and phase of the cycle.	15 working days
Prograf /Tacrolimus	St. Vincent's Hospital (Clinical Chemistry)	Blood 1 x 2.7 mL EDTA tube		Sample to be taken 12 hrs post dose for trough level.	15 working days.
Prolactin	Tallaght Hospital (Clinical Chemistry)	Blood 1 x 2.7 mL Lithium heparin gel tube		None	5 working days
Bioactive prolactin					10 working days
Prostate Specific Antigen Total (tPSA)	NGH (CC)	Blood 1 x 2.7 mL Lithium heparin gel tube		Spin, separate and freeze if not processing same day	1 working day
PSA (Free or Ratio)	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Spin, separate and freeze	5 working days




Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Prostaglandin E2	Eurofins Biomnis	24 hr Urine Collection	3L/24 hr Urine Container	Remove a 10 ml aliquot of 24 hr collection, freeze and transport frozen aliquot	15 working days
Protein 14-3-3	Beaumont Hospital (Neuropathology Lab)	See Prion Protein/CJD above			
Protein Total Blood	NGH (CC)	Blood 1 x 2.7 mL Lithium heparin gel tube		None	1 working day
Protein Total CSF	NGH (CC)	CSF Minimum volume 1 ml in Sterile Universal container	Sterile Universal Container	None	1 working day
Protein Total Fluid (pleural, ascitic etc.)	NGH (CC)	Fluid Minimum volume 2 mls in Universal container	Universal Container	None	1 working day
Protein (Urinary)	NGH (CC)	24 hr Urine collection Refrigerate continuously during 24 hr collection and keep refrigerated until delivered to the Lab.	3L/ 24 hr Urine Container	Plain container No additive required. Refer 2.5 ml of full 24 hr collection for analysis.	1 working day
Protein C (PC) (<i>May be part of thrombophilia screen</i>)	Tallaght Hospital (Coagulation)	Blood 2 x 3.0 mL Trisodium citrate tubes		Must be in NGH Lab before 9.30am. Not tested if patient is on warfarin. Patient's anticoagulation status must be stated. Not recommended if patient has had recent (within last 6 weeks) thrombotic event	12 weeks







Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Protein Creatinine Ratio/ PCR	NGH (CC)	Spot Urine Collected in 200 ml urine container with yellow lid 	Refer monovette tube (yellow cap/Urine Z) filled from 200 ml container as displayed 	Urine container and tube are available from NGH Stores dept. Do not use for other investigations e.g. C/S. Use for PCR and ACR ONLY	1 working day
Protein S / PS (May be part of Thrombophilia screen)	Tallaght Hospital (Coagulation)	Blood 2 x 3.0 mL Trisodium citrate tubes		Must be in NGH Lab before 9.30am. Not tested if patient is on warfarin. Patient's anticoagulation status must be stated. Not recommended if patient has had recent (within last 6 weeks) thrombotic event	12 weeks
Prothrombin Time /PT	NGH (Haem)	1 x 3 mL Trisodium citrate tube		Testing should be performed within 24 hours of specimen collection. Specimen must be filled to line. Over or underfilled samples cannot be processed	1 working day





Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Prothrombin Variant (Also known as Prothrombin (PT) Gene mutation) May be part of Thrombophilia screen	Tallaght Hospital (Coagulation)	Blood 2 x 2.7 mL EDTA tubes		Must be in NGH Lab before 9.30am. Patient's anticoagulation status must be stated.	12 weeks
Pyruvate (CSF)	Tallaght Hospital (Clinical Chemistry)	CSF	Sterile Universal Container	Freeze CSF within 1 hr and transport frozen ASAP.	Same day
Q Fever Antibodies /Coxiella Burnetti	Eurofins Biomnis	See Coxiella burnetti			
Quantiferon TB Gold Plus (TEST FOR TB)	Eurofins Biomnis	Quantiferon TB Gold Plus Pack - (4 x 1.0 mL collection tubes in plastic pack with aspiration needle, and specific request form) Please read instruction leaflet in pack carefully.	QFT packs are available from NGH Specimen Reception.	Samples are shaken vigorously for 5 seconds on receipt. Samples received before 3:30 pm are referred to Eurofins Biomnis in red stat bags. Requests received after 3:30 pm require incubation prior to referral. Quantiferon TB Request Form must accompany each sample for analysis. <i>SAMPLES MUST BE SPUN IF NOT BEING TRANSPORTED FOR >48hrs. AFTER SPINNING LEAVE ON BENCH AT ROOM TEMP.</i>	1-5 working days
Red Cell Folate (Not tested – see serum folate if required).				No longer tested. Bring to attention of Haematology staff.	
Red Cell Plasminogens	Willink Biochemical Genetics Laboratory Manchester Centre for Genomic Medicine, 6 th floor, Saint Mary's Hospital, Manchester UniversityNHS Foundation Trust, Oxford Road, Manchester M139WL	Blood 1 x 2.7 mL EDTA tube		Samples can be taken Mon- Wed only as samples must arrive in Manchester < 72 hrs after collection.	15 working days





Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Renin	Eurofins Biomnis	Blood 1 x 2.7 mL EDTA tube		Spin, separate & freeze within 4 hours. 1 st sample: patient lying down for 3 hours. 2 nd sample: patient standing for 1 hour.	10 working days
Respiratory Syncytial Virus / RSV Immunofluorescence	NVRL	Respiratory samples- BAL NPA Sputum	Sterile Universal Container	Respiratory viruses are thermo-labile. Must be sent to lab ASAP and kept at 4°C	2 working days
Respiratory Syncytial Virus RSV PCR	NVRL	Respiratory samples- BAL NPA Sputum Throat swab	Sterile Universal Container Viral Transport Medium (VTM)	Respiratory viruses are thermo-labile. Must be sent to lab ASAP and kept at 4°C	3-5 working days
RSV PCR NGH patients only (Covid, Influenza A + B tested simultaneously on same swab)	NGH (Mic)	Oronasopharyngeal/ nasopharyngeal swab in Viral Transport Media		Refer to section 10.9.17 RSV testing. Performed on-site daily.	1 working day
Reticulocyte Count	NGH (Haem)	Blood 1 x 2.7 mL EDTA tube		Testing must be complete within 24 hours of specimen collection.	1 working day
Retroviral Disease Test (HIV test)	NVRL	See HIV			
Rheumatoid Factor /RF	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	15 working days







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Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Rhinovirus culture	NVRL	Respiratory secretions-BAL NPA Sputum Throat swab	Sterile Universal container Viral Transport Medium (VTM)	Respiratory viruses are thermo-labile. Must be sent to lab ASAP and kept at 4°C	14 working days
16s r RNA (Ribosomal RNA) Microbial Identification	Bacteriology Reference Department, 61 Colindale Avenue, London NW9 5 HT	Any isolate or sample	Any isolate or sample	Contact Consultant Microbiologist Specific request form (X: Lab/Spec Recpt/ Spec Recp worksheets) needs to accompany sample with 16S PCR requested.	Variable
Rickettsia /Rickettsioses Serology	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	6 working days
Rifampacin	Antimicrobial Reference Lab, Pathology Sciences Building, Southmead Hospital, Westbury-On Trym, Bristol, BS10 SNB	Blood 1 x 4.9 mL Serum gel tube		Spin and separate	15 working days
Risperidone/ Risperidal	Eurofins Biomnis	Blood 1 x 4 mL non gel li heparin tubes only Standard li heparin tube cannot be used. Please request non-gel/green capped vacutainer li heparin tube from laboratory specimen reception.		Spin and separate	12 working days








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Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Ritalin	Eurofins Biomnis	Blood 1 x 6 mL non gel Serum tubes only Standard serum tube cannot be used. Please request non- gel/red capped vacutainer serum tube from laboratory specimen reception		Spin, separate & freeze within 2 hours	12 working days
Rotavirus Electron Microscopy (wild-type and vaccine strain/ Rotarix)	NVRL	Faeces or Copan Faecal Swabs available from NVRL https://nvrl.ucd.ie/swabs	Sterile Universal Container	Separate sample from C+S required for testing.	3 working days
Rotavirus PCR	NVRL	Faeces	Sterile Universal Container	Separate sample from C+S required for testing	5 working days
Rubella Serology	NVRL	Blood 1 x 4.9 mL Serum gel tube Oral fluid	 Sterile Universal container Oracol Swabs available from NVRL or Microbiology lab NGH	None	3 working days
Rubella Culture	NVRL	Blood 1 x 4.9 mL Serum gel tube Urine Oral fluid.	 Sterile Universal container Oracol Swabs available from NVRL or Microbiology lab NGH	None	3 working days
Salmonella	NGH (Mic)	See Culture and Sensitivity Faeces			







Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Salmonella Typing	Galway University Hospital (GUH)	Slope of organism (sent by NGH Micro lab)	Nutrient Agar slope	For confirmation of suspect isolates	7-10 working days
Salmonellosis Serology	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	6 working days
Salicylate	NGH (CC)	Blood 1 x 2.7 mL Lithium heparin gel tube		Non – haemolysed sample	1 working day
Sars CoV-2 PCR	NGH (Mic)	See Coronavirus Sars Cov-2 PCR			
Sars CoV- 2 IgAb/ Covid-19 antibodies	NVRL	Blood 1 x 4.9 mL Serum gel tube or 1 x 2.7 mL Lithium heparin gel tube	 	Download request form from https://nvrl.ucd.ie Requests will not be referred without request form.	5 working days
Scabies Test (Microscopy)	Eurofins Biomnis	Skin scrapings	Sterile Universal Container	None	Variable
Schistosomiasis Serology	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		If positive, confirmation test is performed	5 working days
Schistosoma Eggs /Bilharziasis	Eurofins Biomnis	Urine min volume 25 ml	Sterile Universal Container	Terminal portion of early morning urine void following physical exertion	4 working days
Scleroderma Panel/ Progressive Systemic Sclerosis. Anti-Scl-70 Abs, Anti centromere A Abs, Anti centromere B Abs, Anti- RNA polymerase III (155)Ab, Anti-fibrillar Abs, Anti-NOR90 Abs, Anti-Th/To Abs, Anti- PM100 Abs, Anti-PM75 Abs, Anti-Ku Abs , Anti- PDGFR Abs	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Consultant only request.	10 working days





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Selenium	Eurofins Biomnis	Blood 1 x 6 ml dark blue caped sodium heparin tube Sample tube may need to be preordered – contact the laboratory specimen reception.		None	15 working days
Semen Analysis & Morphology	Not Available	These samples need to be examined rapidly so there will be no facility for us to transfer samples to another lab.		Semen samples arriving in lab will not be processed.	
Serotonin /5- Hydroxythryptamine 5HT	Eurofins Biomnis	Whole Blood 1 x 4 mL non gel li heparin tubes only Standard li heparin tube cannot be used. Please request non- gel/green capped li heparin vacutainer tube from laboratory specimen reception.		Whole Blood. Do not separate. Freeze ASAP. 48 hrs before collection, avoid bananas, chocolate, dried fruit, citrus fruit, avocados, tomatoes, plums, kiwi, pineapple & molluscs.	15 working days
Seroquel/ Quetiapine	Eurofins Biomnis	Blood 1 x 4 mL non gel li heparin tubes only Standard li heparin tube cannot be used. Please request non- gel/green capped vacutainer li heparin tube from laboratory specimen reception.		Spin and separate	15 working days.
Sex Hormone Binding Globulin /SHBG <i>If requested with Testosterone, please refer to FAI</i>	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	15 working days












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Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Shigella	NGH (Mic)	See Culture and Sensitivity Faeces			
Shigella Typing	Galway University Hospital (GUH), Microbiology Lab	Slope of organism (sent by NGH Micro lab)	Nutrient Agar slope	For confirmation of suspect isolates	7-10 working days
Shingles	NVRL	See Varicella Zoster Virus			
Sickle Cell Screen /HBS	NGH (Haem)	Blood 1 x 2.7 mL EDTA tube		Batched once daily (pm). Testing must be completed within 7 days of specimen collection. Please state transfusion history in previous 3 months.	1 working day
Sjogrens Syndrome (ANA, RF, SS-A,SS-B)	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	7-10 working days
SLE Screen /Systemic Lupus Erythematosus	Eurofins Biomnis	See Anti-Nuclear Antibodies			
Sodium	NGH (CC)	Blood 1 x 2.7 mL Lithium heparin gel tube		None	1 working day
Somatostatin	Eurofins Biomnis	Aprotinine (pink in colour supplied on request from lab), as used for ACTH		Spin , separate and freeze within 1 hr	Variable






Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Testosterone	Tallaght Hospital (Clinical Chemistry)	Blood 1 x 2.7 mL Lithium heparin gel tube		None	5 working days
Tetanus Antibodies	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	15 working days
Thalassaemia screen	St James's Hospital (Haematology Lab)	See Haemoglobinopathy Screen			
Theophylline	Tallaght Hospital (Clinical Chemistry)	Blood 1 x 2.7 mL Lithium heparin gel tube		Trough: Pre dose	5 working days
Thrombophilia Screen [PT, APTT, Fibrinogen, Protein C, Protein S, Anti-thrombin, APCR (Activated Protein C Resistance) Screen, Factor V Leiden, Prothrombin variant, Lupus anticoagulant (incl. anti-β2 Glycoprotein, anti-cardiolipin abs, anti-phospholipid abs)].	Tallaght Hospital (Coagulation Lab)	Blood 2 x 2.7 mL EDTA tube 6 x 3.0 mL Trisodium citrate tubes 2 x 4.9 mL Serum gel tube Note: The sample requirements stated here are for a full Thrombophilia screen. If referring single tests refer to the requirements listed under that individual test	  	Accepted only if patient is >6weeks post thrombotic event. Include this information on request form. Patient anticoagulation status MUST be stated. Not performed if patient is on Direct Oral Anticoagulants (DOAC's, heparin or Clexane) Suitable if patient is stable on warfarin therapy. Samples must be received in Laboratory before 09:30 am. For further information on recommendations for thrombophilia testing refer to National Laboratory Handbook on thrombophilia testing.	12 weeks unless deemed urgent by Consultant Haematologist



Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Thyroglobulin	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Non haemolysed sample	15 working days
Thyroid Peroxidase Antibodies /TPO	Tallaght Hospital (Clinical Chemistry)	Blood 1 x 2.7 mL Lithium heparin gel tube		None	5 working days
Thyroid Function Tests /FT4 and TSH	NGH (CC)	Blood 1 x 2.7 mL Lithium heparin gel tube		None	2 working days
Thyroid Hormone Resistance (Genetic Testing)	East Anglian Medical Genetics Services, Genetics Lab, Box 143, ACT Level 6, Addenbrook's Hosp, Hills Rd, Cambridge, CB20QQ, UK	Blood 2 x 2.7 mL EDTA tubes		Take samples early in the week to ensure stability for referral	20 working days
Thyroid Hormone Resistance (Alpha sub-unit testing)	Clinical Laboratory Services, Level minus 1, Queen Elizabeth Hospital Birmingham, Mindelsohn Way, Birmingham, B15 2 WB.	Blood 1 x 4.9 mL Serum gel tube		Spin, separate and freeze ASAP	20 working days
Thyroxine- binding globulin /TBG	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Spin, separate and freeze within 4 hours	7 working days
Total Thyroxine/ Total T4	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	1 working day





Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Tissue plasminogen Activator	St James's Hospital (NCHCD)	Blood 2 x 3.0 ml Trisodium citrate tube.		In consultation with Haematology team in Tallaght Hospital	2 weeks
Tissue Transglutaminase Antibodies (TTG)	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	15 working days
Tobramycin	Tallaght Hospital (Microbiology)	See Antibiotic Assays			
Topiramate /Topamax	Eurofins Biomnis	Blood 1 x 6 mL non gel Serum tubes only Standard serum tube cannot be used. Please request non-gel/red capped vacutainer serum tube from laboratory specimen reception		Spin, separate & freeze within 4 hours	15 working days
Total Iron Binding Capacity /TIBC	Eurofins Biomnis	Blood 1 x 4.9 ml Serum gel tube or 1 x 2.7 mL Lithium heparin gel tube	 	None	6 days
Total Tau	St James's Hospital (Immunology)	CSF- 4 mls, taken into separate polypropylene tube – available from laboratory prior to sampling and not used for C&S/Cell Count		Assayed Mon-Fri only. Dispatch immediately on receipt. Phone 01 4162925 prior to dispatch. Sample must arrive at St James's within 2 hrs of collection and by latest 4 pm so must be taken early in the day.	1-2 working days






Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
<p>Toxicology Screen (Blood)</p> <p>Profile consists of Barbiturate, Benzodiazepine, Tricyclics, Paracetamol, Salicylates & Alcohol</p> <p>Alcohol, Paracetamol and Salicylate assayed at NGH prior to referral</p> <p>Note: Independent Toxicology analysis as required for court cases are not covered. The requester needs to source these labs privately and send samples <i>directly</i> to their chosen lab.</p>	Eurofins Biomnis	<p>Blood 1 x 6 mL non gel Serum tube</p> <p>Standard serum tube cannot be used. Please request non-gel/red capped vacutainer serum tube from laboratory specimen reception</p>		<p>Spin, separate & freeze within 4 hours. Please indicate on request form that alcohol, paracetamol and salicylate not required</p>	15 working days
		<p>and</p> <p>Blood 1 x 2.7 mL Lithium heparin gel tube</p> <p>(For alcohol, paracetamol and salicylate at NGH)</p>			1 working day
<p>Toxicology Screen (Urine)</p> <p>Profile consists of Barbiturate, Benzodiazepine, Cocaine, Opiates, Propoxyphene, Cannabis, Acetaminophen, Methadone, LSD & Alcohol levels</p>	Eurofins Biomnis	Spot Urine	Universal Container Minimum volume 10 mls	Note: Independent Toxicology analysis as required for court cases are not covered. The requester needs to source these labs privately and send samples <i>directly</i> to their chosen lab.	15 working days
Toxocariasis	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	6-7 working days
Toxoplasmosis /Toxoplasma Gondii Serology	NVRL	Blood 1 x 4.9 mL Serum gel tube		None	2-3 working days








Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
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TPMT /Thiopurine Methyltransferase	Eurofins Biomnis	Whole Blood 2 x 2.7 mL EDTA tube		Samples to be taken Mon and Tues only.	8 weeks
TP53 /Tumour Protein 53	St James's Hospital (Cancer Molecular Diagnostics Laboratory)	Whole Blood 2 x 2.7 mL EDTA tube		None	Variable
Transferrin	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube or 1 x 2.7mL Lithium heparin gel tube	 	None	15 working days.
Transferrin Saturation (Calculation)	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube or 1 x 2.7mL Lithium heparin gel tube	 	None	6 working days
Transferrin Soluble Receptors	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	8 working days
Transfusion Reaction Investigation	NGH (Blood Transfusion)	Blood 1 x 7.5 mL EDTA tube and 1 x 2.7ml EDTA tube and 1 x 2.7mL Lithium heparin gel tube and 3 x 4.9 mL Serum gel tube and 10 ml blood taken into a set of BactTALERT blood culture bottles. Urine: First urine post incident	   	See guidelines for management of transfusion reactions and adverse events – (PPPG 155) Blood Transfusion Manual. All blood products and packs with giving set attached must be returned to Blood Transfusion Department.	7 working days Serological results will be available on the next routine day.







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Treponema Pallidum /Treponema Pallidum Assay, /TPHA/VDRL)	NVRL	See Syphilis Serology			
Triglycerides	NGH (CC)	Blood 1 x 2.7 mL Lithium gel tube		Fasting Triglycerides-patient should be fasting 12 hours prior to collection	1 working day
Trichomonas Vaginalis	NVRL	APTIMA collection device kits. Tests for <i>Chlamydia trachomatis</i> and <i>Neisseria gonorrhoea</i> simultaneously, for use on non-blood samples 3 types-vaginal swab; Unisex/endocervical swab; and urine.	APTIMA collection device kit only	Kits available from NVRL – refer to www.nvrl.ucd.ie . Ensure urine specimen containers are filled to the correct volume and are not past expiry date stated. Use NVRL STI request form available at following link https://nvrl.ucd.ie/sites/default/files/uploads/pdfs/LF_UM_001o_rev8_STI_Inv estigation_Request_Form.pdf	7 working days
Troponin T	NGH (CC)	Blood 1 x 2.7 mL Lithium heparin gel tube		Non-haemolysed sample.	<1 Hr 30 mins
Tryptase	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Sample taken as soon as possible after anaphylactic shock. Repeat at 2 hrs & 8 hrs.	15 working days
TSH Receptor Antibodies /TRAB	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	15 working days
Tuberculosis /TB	Tallaght Hospital (Microbiology Lab)	See Acid Fast Bacilli (AFB)			
Tumour Necrosis Factor /TNF	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Spin, separate and freeze within 4 hrs.	15 working days
Typhoid serology	Eurofins Biomnis	See Salmonellosis Serology			





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Urate	NGH (CC)	Blood 1 x 2.7 mL Lithium heparin gel tube		None	1 working day
Urea (Blood)	NGH (CC)	Blood 1 x 2.7 mL Lithium heparin gel tube		None	1 working day
Urea (Urine)	Eurofins Biomnis	24 hr Urine collection	3L/ 24 hr Urine Container	Plain container. No additive required. Refer min 10 ml aliquot labelled as from 24 hr urine	15 working days
Urinary antigens (Atypical pneumonia- Legionella + Pneumococcal)	NGH (Mic)	Urine 10 mls	Sterile Universal Container	Only with relevant clinical details. ICU and Liffey patients with no clinical details. All others must have prior approval	1 working day
24 Hr Urinary Electrolytes (Na, K, Cl)	NGH (CC)	24 hr Urine collection	3L/ 24 hr Urine Container	Plain container No additive required. 5 ml aliquot from 24 hr collection required for analysis	1 working day
Urinary Electrolytes /Spot Electrolytes(Na, K, Cl)	NGH (CC)	Spot Urine : min 5 ml	Universal Container	None	1 working day
Urinary Hemosiderin	St James's Hospital (Haematology Lab)	Urine : min 10 ml	Universal Container	None	Variable
Urinary Urate	Eurofins Biomnis	24 hr Urine collection	3L/24 hr Urine Container	Plain container, no additive 5 ml aliquot of 24 hr collection referred labelled as 24 hr collection	15 working days






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Urinary Urobilinogen	Eurofins Biomnis	Urine : 10 mls EMU	Universal Container	Refrigerate.	5 working days
Ustekinumab/ Stelera	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Spin, separate and freeze Sample date and time are mandatory on form.	21 working days
Valproate	Tallaght Hospital (Clinical Chemistry)	Blood 1 x 2.7 mL Lithium heparin gel tube		Blood levels are not particularly useful in adjusting the dose, but they may be useful for checking compliance.	5 working days
Vancomycin	NGH (Micro)	See Antibiotic Assays			
Vanillylmandelic Acid /VMA	Beaumont Hospital	See Catecholamines			
Varicella Zoster Virus/ VZV/ Chickenpox/ Shingles Serology: IgG only	NVRL	Blood 1 x 4.9 mL Serum gel tube		None	3 working days
Varicella Zoster Virus/ VZV PCR (CSF)	NGH (Mic)	See CSF for Virology			
Varicella Zoster Virus/VZV) PCR – primary infection	NVRL	Blood 1 x 4.9 mL Serum gel tube Vesicular fluid Eye swab Respiratory secretions Skin lesion scrapings	 Viral Transport Media Universal Container	None	Serum : 2 working days All other samples : 5 working days

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Vasculitic screen	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	15 working days
Vasoactive Intestinal Peptide/VIP	Eurofins Biomnis	Aprotinine (pink in colour supplied on request from lab), as used for ACTH		Spin, separate and freeze both samples within 1 hr.	15 working days
Vedolizumab	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Spin, separate and freeze Sample date and time are mandatory on form.	21 working days
Very Long Chain Fatty Acids/VLCFA	Willink Biochemical Genetics Laboratory Manchester Centre for Genomic Medicine, 6 th floor, Saint Mary's Hospital, Manchester University NHS Foundation Trust, Oxford Road, Manchester M13 9WL	Blood 2 x 2.7 mL EDTA tube		Samples can be taken Mon- Wed only as samples must arrive in Manchester < 72 hrs after collection.	15 working days
Virology/Viral Screen	NVRL	Will not be processed without accompanying clinical information. Contact www.nvrl.ucd.ie for further information.			Variable
Vitamin A /Retinol	Eurofins Biomnis	Blood 1 x 4.0 mL non gel li heparin tubes only Standard li heparin tube cannot be used. Please request non- gel/green capped vacutainer li heparin tube from laboratory specimen reception.		Protect from light. Spin, separate & freeze within 1 hr.	15 working days



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Vitamin B ₁ /Thiamine	Eurofins Biomnis	Whole Blood 1 x 2.7 mL EDTA tube		Whole Blood. Protect from light. Freeze whole blood within 4hrs.	15 working days
Vitamin B ₂ /Riboflavin	Eurofins Biomnis	Whole Blood 1 x 2.7ml EDTA tube		Whole Blood frozen within 4 hrs.	15 working days
Vitamin B ₃ /Niacin	Eurofins Biomnis	Whole Blood 1 x 2.7ml EDTA tube		Whole Blood. Protect from light. Freeze whole blood within 4hrs.	15 working days
Vitamin B ₆ /Pyridoxal Phosphate	Eurofins Biomnis	Whole Blood 1 x 2.7 mL EDTA tube		Whole Blood. Protect from light. Freeze whole blood within 4hrs.	15 working days
Vitamin B ₁₂	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Request should include appropriate clinical details	6 working days
Vitamin C /Ascorbic Acid	Eurofins Biomnis	Blood 1 x 4.0 mL non gel li heparin tubes only Standard li heparin tube cannot be used. Please request non- gel/green capped vacutainer li heparin tube from laboratory specimen reception.		Protect from light. Spin, separate & freeze < 1 hour	15 working days
Vitamin D /25 OH Vitamin D	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Store at 4°C. Request should include appropriate clinical details	15 working days

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Vitamin D /1,25- dihydroxyvitamin D	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Store at 4°C	15 working days
Vitamin D2 /Ergocaliferol	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Store at 4°C	15 working days
Vitamin D3 /Cholcalciferol	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		Store at 4°C	15 working days
Vitamin E /Tocopherol	Eurofins Biomnis	Blood 1 x 4.0 mL non gel li heparin tubes only Standard li heparin tube cannot be used. Please request non- gel/green capped vacutainer li heparin tube from laboratory specimen reception.		Protect from light. Spin, separate & freeze within 4 hrs	15 working days
Vitamin K /Phylloquinone	Eurofins Biomnis	Blood 1 x 6 mL non gel Serum tubes only Standard serum tube cannot be used. Please request non- gel/red capped vacutainer serum tube from laboratory specimen reception		Contact the laboratory Protect from light. Spin, separate & freeze within 4 hrs	15 working days
Von Willebrand Factor /vWF	St James's Hospital (NCHCD)	Blood 4 x 3.0 mL Trisodium citrate tubes		In NGH lab by 9.30 am. In consultation with Consultant Haematologist only. Send same day	3 weeks

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Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Voriconazole	Mycology Reference Laboratory. (National Infection Services, PHE South West Laboratory, Science Quarter, Southmead Hospital, Bristol BS10 5 NB England). Phone : 0044 117 4146222	Blood 1 x 4.9 ml Serum gel tube		Spin, separate & freeze within 4 hours Specific request form required available at https://www.gov.uk/government/publications/diagnostic-mycology-and-assays-referral-form	15 working days
Von Willebrand Factor Cleaving Protease/ ADAMTS-13	Eurofins Biomnis	Blood 2 x 3.0 mL Trisodium citrate tubes		Spin samples twice, separate and freeze. Take Mon, Tues only. Special form required at following link https://www.eurofins-biomnis.com/referentiel/liendoc/requisitions/INTGB/R5-INTGB-FRC_Haemostasis.pdf	15 working days
VRE Screen	NGH (Mic)	Faecal/Rectal Swab Faeces	Red Topped Dual Swab Transport swab Sterile Universal Container	All wards except ICU need prior approval by Consultant Microbiologist.	1-5 working days
WBC Differential (Part of Full Blood Count)	NGH (Haem)	Blood 1 x 2.7 mL EDTA tube		Testing must be completed within 24 hours of specimen collection	1 working day
Weils Disease /Leptospira	NVRL	Blood 1 x 4.9 mL Serum gel tube		None	4 working days.

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Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
West Nile Virus	NVRL	Blood 1 x 4.9 mL Serum gel tube		By prior arrangement only. Contact NVRL	Variable
Whipples <i>Tropheryma</i> <i>Whippelii</i>	Eurofins Biomnis	1 x 2.7 mL EDTA tube		None	15 working days
Whooping Cough <i>Bordetella</i> <i>pertussis</i>	Tallaght Hospital (Microbiology)	See Bordetella Pertussis			
Xanthochromia	Beaumont Hospital (Clinical Chemistry)	CSF- Min 1 ml requires	Sterile Universal Container	<u>Out of hours:</u> Clinician to contact Biochemistry in Beaumont to arrange testing. Spin and separate supernatant within 1 hr. Protect from light (cover in tin foil). Phone 01 8092704 and send ASAP. If not sending ASAP, refrigerate covered until next working day	1 working day
Yersinia screening	NGH (Mic)	Faeces	Sterile Universal Container	Contact NGH Microbiologist if suspected case	2 - 4 working days
Yersinia serology	Eurofins Biomnis	Blood 1 x 4.9 mL Serum gel tube		None	6 working days
Zika Virus/ ZV PCR /RNA	NVRL	Blood 1 x 2.7 mL EDTA tube or CSF	 Sterile Universal Container	None	15 working days
Zika Virus /ZV Serology	NVRL	Blood 1 x 4.9 mL Serum gel tube		None	20 working days

LABORATORY USER MANUAL

Test/Profile	Testing Location NGH location: CC = Clin Chemistry Haem = Haematology Mic = Microbiology	Specimen Type/ Requirements	Tube Cap Colour or Container Type	Special Requirements	Turnaround Time (If urgent, contact lab)
Please Note: Test analysis may not be performed if relevant clinical details are not supplied on request form					
Zinc	Eurofins Biomnis	Blood 1 x 6mL sodium heparin tube , dark blue cap Sample tube may need to be preordered – contact the laboratory specimen reception.		None	15 working days
Zn/TB /Acid fast bacilli	Tallaght Hospital (Microbiology)	See Acid Fast Bacilli /AFB			Interim AFB smear report 1 working day Full report up to 42 days
Zonisamide/ Zonergan	Eurofins Biomnis	Blood 1 x 6 mL non gel Serum tubes only Standard serum tube cannot be used. Please request non- gel/red capped vacutainer serum tube from laboratory specimen reception		Spin, separate & freeze within 4 hours	15 working days