ST. VINCENT'S HEALTHCARE GROUP

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St Vincent's Healthcare Group
Department of Pathology and Laboratory Medicine

PATHOLOGY USER HANDBOOK

Edition 10.1
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Note this edition contains minor updates to Edition 10 as detailed on page 4
(Document valid until September 2026)

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SUMMARY OF CHANGES

The following is a summary of changes to this edition of the document. Users are also informed of significant changes by memo.

Changes from edition 10	
Section	Significant changes from previous edition
Section 3	Information for patients related to use of information
Section 5.2	Updates for Key Personnel Laboratory Manager
Section 8.2	Inclusion of Blood Transfusion consent process

PART 1 – GENERAL USER INFORMATION

1.0 INTRODUCTION

The Department of Pathology and Laboratory Medicine St Vincent's Healthcare Group consists of laboratories at St Vincent's University Hospital, St Vincent's Private Hospital and St Michael's Hospital, Dun Laoghaire.

In 2003 the company St Vincent's Healthcare Group Ltd was created to include the activities carried out in St Vincent's University Hospital (SVUH), St Michael's Hospital (SMH) and St Vincent's Private Hospital (SVPH). In mid-2016, St Vincent's Healthcare Group became a Designated Activity Company (DAC).
SVUH, SMH and SVPH are not stand alone legal entities. SVUH, SMH and SVPH are three branches/ trading divisions of the one legal entity which is SVHG. SVHG is a unique legal entity within the Irish Hospital sector as it comprises SVUH and SMH, publically funded hospitals and SVPH, a private hospital.

The Department of Pathology and Laboratory Medicine at St Vincent's University Hospital provides a diagnostic and consultative service for the hospitals within the group as well as GP's and local hospitals and is also a regional and national referral centre for specialised tests. St Vincent's University Hospital is an adult provision, and the services provided by Pathology at St Vincent's University Hospital are for the adult population. The Satellite Laboratory at St. Vincent's Private Hospital provides Biochemical and Haematological diagnostic and consultative services for St. Vincent's Private Hospital. St. Michael's Hospital runs a Haematology and Clinical Chemistry Department which performs routine blood testing for hospital patients and a phlebotomy service for inpatients, out patients and GP patients.

Please refer to LP-GEN-007 for St. Columcilles Hospital Laboratory User Manual. This manual is designed to provide a guide to Clinical Chemistry and Haematology services provided by the Laboratory of St Columcilles Hospital (SCH). The SCH Blood Transfusion service, Microbiology and Histology are provided by St Vincent's University Hospital.

This Pathology User Handbook gives an overview of the services provided, contact details for key laboratory personnel and opening times for individual departments. The information in this manual is subject to change and the most up to date version is available on the SVUH Q-pulse or hospital website.

Information for patients in relation to accessing hospital services, providing feedback and making complaints is available on the St Vincent's Hospital Website www.stvincents.ie. The Pathology User Handbook also provides information which may be necessary for patients using the service where required. This includes test methods used, comments and guides for interpretation and turnaround times. In particular, please refer to section 9 Specimen Collection and Collection Information for Patients for information in relation to collecting specimens.

This document also gives an alphabetic listing of the test repertoire (Refer to Appendix 1). The type of specimen required, container type and volume, reference range/ clinical decision levels and target turnaround time (TAT) is listed for these tests. The Department has a policy that requesters are notified when it is known that the TAT for a test will be significantly delayed and when the delay could compromise patient care.

As this manual is intended as a quick reference guide for users it is not possible to include details of all the laboratory services. If further information is required on any aspect of the services do not hesitate to contact the department.

2.0 QUALITY ASSURANCE

The department is committed to providing a high quality service with the minimum of delay to meet the needs and requirements of the users. To ensure a high quality service all departments have extensive internal quality control checks and participate in recognised External Quality Assessment Schemes.

The Blood Bank, Clinical Chemistry, Haematology, Histology and Immunology laboratories in the Pathology Department in St Vincent's University Hospital operate in compliance with ISO15189 and are accredited by INAB. The Blood Bank as per requirements of the EU Blood Directive is accredited by INAB. The Tissue Establishment operates under the license of the HPRA, and, as part of St. Vincent's Hospital Stem Cell Transplant Program, is accredited by JACIE under 7th Edition of the Standards for autologous peripheral stem cell collection, processing and administration.

Testing in Microbiology, and in Clinical Chemistry and Haematology in the Satellite Laboratory in St Vincent's Private Hospital are not currently in the scope of accreditation.

Details of the scope of accreditation can be found on the INAB website www.inab.ie (directory of accredited bodies, registration number 192MT), or on request from the laboratory. The laboratory has been approved to operate a flexible scope of accreditation in some areas. The lists of tests currently approved under the laboratory's flexible scope process are available by contacting the laboratory.

The department complies with the Hospital policies on data protection and confidentiality of information, in addition to local Departmental policies as outlined in MP-GEN-DATAMAN Management of Data and Information.

Laboratory Management is committed to:
Staff recruitment, training and development at all levels to provide an effective and efficient service to its users.
Providing and managing resources to ensure that Laboratory examinations are processed to produce the highest quality results possible.
Reporting results in ways, which are timely, confidential, accurate and are supported by clinical advice and interpretation when required.
Implementation of internal quality control, external quality assessment, audit and assessment of user satisfaction to continuously improve the quality of the service.
The safe testing and distribution of blood and blood products.

It is Department's policy to provide education and to participate and encourage appropriate research and development. Many of the medical and scientific staff take an active part in education, research and clinical audit. If laboratory staff can contribute to educational activities or collaborate in research projects please let us know.

3.0 USER SATISFACTION, PATIENT FEEDBACK, COMMENTS AND COMPLAINTS

The main goal of laboratory staff is to ensure that our users receive accurate, reliable, meaningful and timely laboratory results. It is the policy of the Department of Pathology & Laboratory Medicine to identify, record, investigate, classify and resolve all non-conformities and complaints. Feedback is provided to complainants.

The Department has processes in place to ensure that patients are made aware of issues or errors in relation to their samples or testing. Minor issues related to specific samples (such as sample rejections etc) will be communicated through the requesting clinician on the report or by telephone. The clinician will then inform the patient and actions can be implemented as appropriate (for example request for re-testing). For more significant issues, the hospital has an open disclosure policy which ensures that relevant risks associated with adverse events or near misses are disclosed to patients where required.

If clinical users encounter problems with the pathology services or have suggestions for service improvement please contact Roisin Wheatley, Laboratory Manager, St Vincent's University Hospital, Telephone 221 4510 / email rowheatley@svhg.ie, Rebecca Nolan, Chief Medical Scientist, St Vincent's Private Hospital, Telephone 01 263 8397 / email r.nolan@svph.ie, or Fiona Donohue, Chief Medical Scientist, St. Michaels's Hospital, Telephone 01 663 9868 / email f.donohue@stmichaels.ie

In St Vincent's University Hospital, issues encountered by patients in relation to the service can also be brought to the attention of the Department through the St Vincent's Hospital Patient feedback and complaints procedure. There is a designated email for providing feedback: feedbackandcomplaints@svhg.ie. Feedback or complaints relevant to the Department of Pathology and Laboratory Medicine will be forwarded to the department for resolution. Refer to www.stvincents.ie for further information.

The Department of Pathology and Laboratory Medicine does not report results directly to patients. Results are reported to the requesting clinician, who will provide the results to the patient along with the clinical interpretation and advice required. Issues or problems arising from patient samples will also be reported to the clinical teams, who will notify the patient. For Freedom of Information requests, please contact the Freedom of Information Office at St Vincent's University Hospital at foi@svuh.ie.

All personal information handled by the Department is treated with confidentiality as per Hospital policies and local requirements. In cases where personal information is required to be shared (for example during complaints resolution, release of information to patient's solicitor in relation to legal proceedings), the patient will be informed as per hospital policy in conjunction with the Quality and Patient Safety Department.

The Department of Pathology And Laboratory Medicine welcomes feedback and suggestions from patients and users of the service. Patients who have queries or feedback in relation to selection of tests or examination methods or interpretation of results should discuss in the first instance with their requesting clinician. The requesting clinician will be able to advise and follow up with the laboratory if required. As a commitment to meet the needs and requirements of users, and as a means of quality improvement, we aim to survey users of the Pathology service each year to determine their satisfaction with the current service, and any comments they may have for improving the service. Each year the Department will publish a number of User Satisfaction Surveys in relation to specific aspects of the service. We encourage users to have their say by completing these surveys.

4.0 LOCATION AND OPENING HOURS

4.1 Pathology Reception SVUH

There is currently no Pathology Reception service in SVUH.

All visitors to the laboratory must contact the laboratory staff member whom they are meeting in order to gain access to the Department. Visitors must not enter the Department without the supervision of the relevant staff member.

External personnel visiting the department (for example service engineers and suppliers) will be asked to complete a form MF-GEN-EXTMODRULES on their arrival. This is to confirm that they comply with the requirements (in terms of health and safety, confidentiality, impartiality and competence) of the department's Model Rules procedure. A copy of this procedure MP-GEN-MODRULES titled Model Rules for Staff and Visitors Pathology is available to view on the St Vincent's University Hospital website www.stvincents.ie.

For regular scheduled couriers delivering samples, access to the Department to deliver samples can be made through the Intercom at the Department entrance on the third floor of the ADCC building.

Other patients, GP's or couriers delivering specimens from external locations can leave specimens in the Pathology Specimen Collection box located in the Main Reception area of the ADCC (near the main hospital entrance), during the hours 8am-4pm Monday - Friday.

GP's can obtain a supply of request forms and specimen containers from Aquilant. Refer to section 7.5 for further information.

4.2 Laboratory

4.2.1 St. Vincent's Healthcare Group

The address of St Vincent's Healthcare Group Department of Pathology and Laboratory Medicine is:
Department of Pathology and Laboratory Medicine
St Vincent's Healthcare Group
Elm Park
Dublin 4

4.2.2 St Vincent's University Hospital (SVUH)

The laboratory is located on the third floor of the Clinical Services Building. Access to the department is via the lifts opposite the reception desk at the main entrance to the hospital. The location of each discipline is signposted from the lift. Access to the laboratory is controlled by swipe card. All visitors to the department should gain entry by contacting the person that they are attending to visit.
The requirements of a major academic hospital are reflected in the scope of the laboratory services with Blood Transfusion, Haematology, Clinical Chemistry, Histopathology, Immunology and Microbiology services available on site.

The postal address of the laboratory is:
Pathology Department,
St. Vincent's University Hospital,
Elm Park,
Dublin 4.
Telephone: + 353 1 2214590 (Pathology Reception)
Fax: + 353 1 2691285

SVUH Laboratory Opening Hours
Refer to section 5.1 for laboratory contact details during routine and out of hours periods.

Department	Opening Hours	
Central Specimen Reception	Monday – Friday 8am - 4pm (Gp Bloods)	
Clinical Chemistry Blood Transfusion Haematology	Routine Laboratory Hours Monday – Friday 8am – 8pm Saturday 9:30am – 12:45pm	Emergency Out of Hours Service (On-Call Service) Monday – Friday 8pm – 8am Saturday 12:45pm – Monday 8am.
Microbiology	Routine Laboratory Hours Monday – Friday 8am – 8pm Saturday 9:30am – 12:45pm Sun (BH) 9.30am-12.45pm (Blood cultures only)	Emergency Out of Hours Service (On-Call Service) Monday – Friday 8pm – 8am Saturday 12:45pm – Monday 8am.
Histology	Monday – Friday 8am – 6pm Saturday – 9:30 am – 12:45pm	
Immunology	Monday – Friday 8 am – 5pm	

4.2.3 St Michael's Hospital (SMH)

The laboratory in SMH is located on the ground floor just off the main entrance hall at the front of the hospital.
The postal address of the laboratory is:
Pathology Department
St. Michael's Hospital,

Dun Laoghaire
Co. Dublin
Telephone: + 353 1 6639871 (Laboratory office)
Fax: + 353 1 2806351

SMH laboratory provides routine Clinical Chemistry, Haematology and Coagulation testing. All other tests are referred to the relevant laboratory at SVUH. Out of Hours, service is provided by SVUH.

Contact during routine hours; direct laboratory number 6639830 or SMH switch; 2806901 / 6639800 laboratory Ext's 7169/7170.

Nursing Administration if the laboratory is not contactable via SMH switch; 2806901 / 6639800 Ext 7155 or Bleep 7065 via switch.

Out of hours 8pm-8am Nursing Administration via SMH switch; 2806901 / 6639800 Ext 7155 or Bleep 7065 via switch.

'Out of hours specimens should be sent through Nursing Administration. Courier service is provided by Blood Bike East from 7pm to 6am Monday to Friday and all day Saturday, Sunday and Bank Holidays Ph. 089-4076868. Alternatively, specimens can be sent by Taxi organised by SMH Switch.

SMH Laboratory Opening Hours

Department	Opening Times	
SMH Laboratory Haematology & Clinical Chemistry	Routine Laboratory Hours Monday – Friday 8am – 8pm Saturday Morning 8am-1pm On Call Hours Saturday 1pm - 8pm Sunday 8am - 8pm	Emergency Out of Hours Service Provided by the laboratory at SVUH 8pm-8am

List of the tests performed at SMH Laboratory:

Test Performed in SMH Laboratory	
Clinical Chemistry	Haematology/Coagulation
Urea and Electrolytes (Na, K, Cl, Urea, Creatinine)	FBC
Liver Function Tests (Alb, Bili, Alk Phos, GGT,ALT,AST, Total Protein)	ESR
CRP	Blood Films
Ca, PO4, Mg	PT
Amylase	INR
LDH	APTT
Lipids (T. Chol, Tg, HDL Chol, LDL Chol)	D-Dimers
CK	Fibrinogen
Glucose	Infectious Mono
Uric Acid	Pregnancy Testing
Troponin T	
BNP	
Urinary Pregnancy Testing	

SMH Turnaround times are 4 hours for routine Haematology and Biochemistry tests, 2 hours for Urgent Haematology and Biochemistry tests. Ref: LP-SMH-TAT.

Transport of Samples from SMH:
Samples must be packed to UN Packaging Instruction 650 see Section 23.2.1
Routine Courier to SVUH runs at 10.00, 12.00 and 3 pm daily Monday to Friday
Routine referred tests must reach SVUH by 11.00 am on Saturdays and Sundays.

Out of hours specimens should be sent out through nursing administration. Courier service is provided by Blood Bike East from 7 pm to 8 am Monday to Friday and all day Saturday, Sunday and Bank Holidays
Ph. 089-4076868. Alternatively specimens can be sent by Taxi organised by SMH Switch.

4.2.4 Satellite Laboratory St Vincent's Private Hospital

The SVPH Satellite laboratory is located on the third floor on the North Wing of the Private Hospital. Access to the laboratory is controlled by swipe card. Visitors to the department can obtain a visitors temporary swipe card from the Security Department near the main entrance on the ground floor. To gain access to the department use the lifts at the centre or far end of the hospital (Opposite end to the main reception).

The postal address of the laboratory is:

Satellite Laboratory,
St.Vincent's Private Hospital,
Merrion Road
Dublin 4.
Telephone: +353 1 2638340 (Laboratory) + 353 1 2638397 (Laboratory office)
Fax: + 353 1 2638327

SVPH Satellite Laboratory Opening Hours

Department	Opening Times	
Satellite Laboratory Haematology + Clinical Chemistry	Routine Laboratory Hours: Monday – Friday 8am – 6pm Saturday & Sunday (and BH): 8am – 3pm	Emergency Out of Hours Service: Provided by the laboratory at SVUH

The satellite laboratory provides routine Clinical Chemistry, Haematology and Coagulation. All other tests are referred to the relevant laboratory at SVUH. Out of Hours service is provided by SVUH.
List of the tests performed at Satellite Laboratory:

Test Performed in SVPH Satellite Laboratory		
Clinical Chemistry		Haematology/Coagulation
Urea and Electrolytes (Na, K, Cl, Urea, Creatinine) Liver Function Test (Alb, Bili, Alk Phos, GGT,ALT) Ca, PO4, Mg, Urate Total Protein Amylase LDH, CK Lipids (T. Chol, Tg, HDL Chol, LDL Chol) Iron Studies (Iron, Transferrin) Glucose AST CRP	TSH, Free T4, Total T3, Free T3 Cortisol Total PSA CEA AFP βHCG CA 19.9, CA 15-3, CA 125 High Sensitivity Troponin T Ferritin, Folate, Vitamin B12 eGFR HbA1c Gentamycin Vancomycin	FBC ESR Blood Films PT INR APTT

Certain analyses such as blood transfusion tests/ requests, therapeutic drug levels and D-Dimers are not performed in the Satellite Laboratory and these specimens should be sent directly via the pneumatic tube (pod) to the relevant SVUH laboratory.

Turnaround Time (TAT) agreements for SVPH Satellite Laboratory:

Turnaround Times in SVPH Satellite Laboratory			
Discipline	Routine	Urgent (Clinically)	Priority (e.g. Daycare Oncology, MAU)
Clinical Chemistry	4 hrs	1 hr 20 mins	2 hrs
Haematology/Coagulation	4 hrs	1 hr 20 mins	3 hrs (to allow for completion of blood films)
Note: These TAT agreements apply to general test requests. Some tests such as HbA1c and Immunoglobulins are run on a batched basis and so are reported on the next running day. Immunoassays such as tumour markers, cortisol and haematinics are run daily but late requests may not be processed until the next working day. Immunoassays outside of Troponin T and βHCG are not processed over weekends and bank holidays.			

4.2.5 St Columcilles Hospital, Loughlinstown

Please refer to LP-GEN-007 for St. Columcilles Hospital Laboratory User Manual for full details
The phlebotomy department is located in the main building to the left of the main entrance to the hospital.
The laboratory in SCH is located on the first floor to the rear of the hospital. External and internal doors are controlled via keypad access.

The postal address of the laboratory is:
Pathology Department
St. Columcille's Hospital,
Loughlinstown,
Co. Dublin.
Telephone: +353 1 211 2007
Fax: +353 1 282 1134

SCH laboratory provides routine Clinical Chemistry, Haematology and Coagulation only for patients attending the hospital. All other tests are referred to the relevant laboratory at SVUH. Out of Hours service is provided by SVUH.
Please contact Nursing Administration for packaging and transport of samples out of hours.

Phlebotomy service is available for hospital patients, OPD patients and GP requests that require pre-analytical intervention.

Department	Opening Times	Out of hours service
SCH Laboratory Haematology + Clinical Chemistry	Routine Laboratory Hours: Monday – Friday: 9.00am–5pm Saturday: 9.00am–12noon	Emergency Out of Hours Service: Provided by the laboratory at SVUH

Routine Courier to SVUH runs at 10.15, 11.30, 13.30 and 15.00 daily Monday to Friday
Routine referred tests must reach SVUH by 11.00 am on Saturdays and Sundays.

Tests Performed in SCH Laboratory		
Clinical Chemistry		Haematology
Profile	Test	Test
Renal Profile:	Urea, Creatinine, Sodium, Potassium, Chloride.	FBC ESR Blood Film PT/INR APTT D-dimer Infectious Mono
Liver Function Test:	T.Bilirubin, T.Protein, Albumin, GGT, ALT, AST, ALP.	
Bone Profile:	Calcium, Phosphate, Albumin, ALP.	
Lipid Profile:	Cholesterol, Triglycerides, HDL-Chol, LDL-Chol (fasting)	
Other:	Amylase CK Glucose Iron/TIBC LDH Magnesium Uric Acid	

4.3 Phlebotomy

4.3.1 Out Patient / GP Phlebotomy SVUH

Outpatient and GP Phlebotomy is located on the 1st floor of Ambulatory Day Care Centre opposite St Mark's Ward.

SVUH Out Patient / GP Phlebotomy Opening Hours	
Out-Patients Phlebotomy Service is by appointment only	Mon to Thurs 8am – 5pm Fri 8am – 4pm Patients can make an appointment on-line on the SVUH website or by phoning 01 291 6188 between 9am and 4pm Monday to Friday (including bank holidays).
GP Phlebotomy Service is by appointment only	Mon to Thurs 8am – 5pm Fri 8am – 4pm Patients can make an appointment on-line on the SVUH website or by phoning 01 291 6188 between 9am and 4pm Monday to Friday (including bank holidays).
Anticoagulation Monitoring Service (AMS)	Mon – Fri 8am – 11am AMS is located in the Herbert Wing (Old Private Hospital)

Access to the phlebotomy service is restricted to patients who are 16 years of age or older.

4.3.2 Out-Patient / GP Phlebotomy SMH

Outpatient /GP Phlebotomy is located in the building on the right hand side of the main entrance to the hospital.

SMH Out Patient / GP Phlebotomy Opening Hours	
Out-Patients / GP Patients	Mon – Thurs 8.00 am – 4.00 pm Fri 11.00am – 4.00pm
Anticoagulation Monitoring Service (AMS)	Tuesday 8.00am – 12.00pm
GP Phlebotomy Service is by appointment only.	Patients can make an appointment by phoning 01-6639871 or online through the SMH website Homepage 'Book your Blood Test online'

	A small number of emergency appointments are available which can be made by the General Practitioner phoning the phlebotomy department at the above number.

Access to the phlebotomy service is restricted to patients who are 16 years of age or older.

4.3.3 Out-Patient/ GP Phlebotomy SVPH

Out Patient/ GP phlebotomy is located on the first floor on the north wing of the hospital in the Out Patient Department. This is a walk in service available from 08:30am – 04:30pm Monday – Friday.
On arrival at the phlebotomy department patients register at reception. The phlebotomist will then call each patient in turn.
Patients must have a GP referral letter or a Consultants referral to attend for blood tests.
There is a charge for the phlebotomy service.

4.3.4 In-house Phlebotomy Service at SVUH, SVPH & SMH

At SVUH a phlebotomy service is available on all wards Mon – Fri from 07:00am – 11:30am.
At SVPH the phlebotomy service is available on all wards Mon – Fri from 07:30am – 4:30pm. The phlebotomy service is limited to urgent requests on Saturday's, Sunday's and Public Holidays. To avail of the phlebotomy service completed request forms must be placed on the ward before 7:00am.
At SMH a phlebotomy service is available on all wards Mon-Fri from 08.00am to 12.30pm. There is an urgent bloods limited phlebotomy service on a Saturday / Sunday and Bank Holidays. There is no phlebotomy service on Christmas Day.

4.4 MORTUARY

4.4.1 SVUH Mortuary

The mortuary is the first building on the right hand side as you enter the hospital from Nutley Lane. Some parking is available. Access is through the main door directly facing Nutley Lane.
Mortuary Opening Times: Monday – Saturday 9am - 5pm.

Special Requests to obtain access outside these hours may be facilitated. Contact the Out of Hours Nurse Manager to discuss requirements.

Family may wish to spend some time with their deceased relative in the mortuary. This can be arranged by contacting the Mortuary Services Co-ordinator to discuss arrangements (Tel: 01 22 14238).

4.4.2 SMH Mortuary

The Mortuary is situated at the back of the Hospital. Post-mortem examinations on patients from St. Michael's are carried out in St. Vincent's University Hospital, Elm Park. In the event of requiring a post-mortem on a patient, envelopes containing all the material the clinicians will require are located in HDU and Emergency Department and are also available in the laboratory office. The patient chart plus the completed forms must be brought to the laboratory office. Further arrangements for the transfer of the remains to St. Vincent's University Hospital Mortuary will be taken care of by laboratory personnel. During out of Hours - Nursing Administration will carry out these duties.

5.0 CONTACT DETAILS FOR KEY LABORATORY PERSONNEL

5.1 General Laboratory Contact details during routine and out of hours periods

St Vincent's University Hospital Laboratory	Routine Opening Hours	Routine Period Contact Details	Out of Hours Contact Details
Blood Transfusion	Mon – Fri 8:00am – 8:00pm Sat 9:30am – 12.45pm	4449 4449	Ext 4449 or bleep 465
Haematology	Mon – Fri 8:00am – 8:00pm Sat 9:30am – 12.45pm	4280/4395 4280	Ext 4785 or Bleep 465
Clinical Chemistry	Mon – Fri 8:00am – 8:00pm Sat 9:30am – 12.45pm	4550/ Duty Scientist for clinical queries 3127 (Mon to Fri 9 am to 5 pm) 4550	Ext 3828 or bleep 159
Microbiology	Mon – Fri 8:00am – 8:00pm Sat 9:30am – 12.45pm	4470/4450	Bleep 465 or Contact switch for Consultant Microbiologist

	Sun (BH) 9.30am-12.45pm (Blood cultures and COVID/Flu only) *Mon-Sun 8pm-12pm (COVID/Flu from ED only)	4912	on-call
Immunology	Mon – Fri 8:00am – 5:00pm	4598	Contact Switch
Histology	Mon – Fri 8:00am – 6:00pm Sat 9:30am – 12.45pm	4330/4137 4613	Contact Switch

Non-urgent general enquiries by email for GPs
An email address is available for GP users of the service who have **non-urgent general** laboratory enquiries:
labresultsenquiry@svhg.ie

Please phone the relevant laboratory instead for more urgent communications.

5.2 Contact details for Referral Laboratories who identify critical results on SVUH samples

Where a critical result is identified on an SVUH patient sample which has been referred to a referral laboratory by SVUH Pathology, the critical result (significantly abnormal or significant unexpected as per local phoning criteria) should be communicated to Pathology SVUH by telephone within an appropriate timeframe according to defined phoning criteria of the referral lab.

For communication of critical results, please contact SVUH Pathology using the following phone numbers:

Laboratory (Routine working hours)	Routine Working Hours	Outside Routine Working Hours
Blood Bank (8am-8pm Mon-Fri and 9.30am-12.45pm Sat)	01 221 4449	Ext 4449 or bleep 465
Haematology 8am-8pm Mon- Fri 9:30am – 12:45pm Sat	01 2214657/ 01 2214280	Mon-Fri 8pm- 8am Scientific Staff On Call Bleep **# 465** via SVUH switch Sat 12:45pm – Mon 8am Scientific Staff On Call Bleep **# 465** via SVUH switch
Clinical Chemistry (9am-8pm Mon-Fri and 9.30am-12.45pm Sat)	9-5pm Mon-Fri: Duty Scientist Tel **01-2213127** 5-8pm Mon-Fri: late Scientific Staff Tel 01 2213828/ 01 2214691 9.30-12.35pm Saturday Scientific Staff on duty Tel **01-2213828/2214691**	Mon-Sun 8pm-8am Scientific Staff On Call Tel: **01 2213828/ 01 2214691**
Immunology (8am-5pm Mon-Fri)	Tel: **01-221 3825** (lab) **01-221 4598** (office) **01-221 4953** (CMS)	
Microbiology (8am-8pm Mon-Fri and 9.30am-12.45pm Sat)	Microbiology Registrars 01 2214949	Consultant Microbiologist on call via switch (**01 2214000).**
Histology (8am-6pm Mon-Fri and 9.30am-12.45pm Sat)	Histology Office: **01 221 4330** Histology CMS: **01 221 3855** Histology Main Lab: **01 221 4613**	Consultant Histopathologist on Urgent Liver Call contacted via SVUH switch (**01 2214000**)

5.3 Key Laboratory Personnel

The key laboratory personnel are listed below. If phoning from outside the hospital please prefix the extension number with (01) 221.

Position	Name	Extension
Director of Pathology and Laboratory Medicine	Prof. Aurelie Fabre	4470
Laboratory Manager	Ms. Róisín Wheatley	4510
Pathology Administration	Mr Cian O'Connor Ms Michelle English/ Ms Laura Nolan	5560 4167
Pathology Quality Manager	Ms Anne Dickinson	3695
Pathology ICT Manager	Mr Ciaran Mooney	3299
Senior Medical Scientist Central Reception Blood Sciences	Ms Carol Smith	5661
Clinical Chemistry SVUH		
Consultant Chemical Pathologist Clinical Advice/Interpretation	Dr. Patrick Twomey	4430
Chief Medical Scientist	Dr Anne Lardner (Interim)	4490
Principal Biochemists	Dr. Mark Kilbane Dr Heloise Tarrant Dr. Thomas Smith Ms Esther Purcell	4513 4607 4629 4789
Duty Scientist (Clinical Enquiries only) Routine Hours 09:00 – 17:00 dutyscientistclinchem@svuh.ie		3127
General Enquiries		4550
Clinical Chemistry Scientist On-Call (and Saturday am) Clinical Advice on-call	 Dr Patrick Twomey Prof. Carel Le Roux	Bleep 159 4654, 3828, (Lab) 3124 (Senior Room) 4371 (Med Res Ext) 0877439023 0864117842

Blood Transfusion		
Consultant Haematologist Clinical Advice/Interpretation/ Haemovigilance	Dr. Joan Fitzgerald Dr. Kieran Morris	3125 / 4449 3125/4449
Chief Medical Scientist	Ms. Denise Neary	4814
Laboratory Enquiries	See extension details	4449/4706
Stem Cell Processing Laboratory	See extension details	4426
Blood Transfusion/Haematology / Microbiology Medical Scientist On-Call	See extension details	4785 / 4449 Bleep 465
Haematology (SVUH)		
Consultant Haematologist/ Clinical Advice /Interpretation	Dr. Karen Murphy Dr. Kamal Fadalla Dr. Joan Fitzgerald Dr. Liam Smyth Dr. Claire Andrews Dr. Mark Coyne Dr. Gerard Connaghan (Lcm) Dr. Maryse Power	3125 / 4280 3125 / 4280 3125 / 4280 3125 / 4449 3125 / 4280 3125 / 4280 3125 / 4280 3125 / 4280
Haematology Registrar	Haematology Team	Bleep 371/665
Chief Medical Scientist	Ms Chrissann Fleming	4783
Anticoagulant Nurse Specialist Anticoagulant Monitoring Service Secretary		Bleep 663 4153
Laboratory Enquires	Admin team	4280
Blood Transfusion/Haematology / Microbiology Medical Scientist On-Call	On Call Duty Scientists	4785 / 4449 Bleep 465
Haematology Fax		01 2213968

Histopathology (SVUH)		
Consultant Histopathologists Clinical Advice/Interpretation	Dr. Tom Crotty Prof. Kieran Sheahan Prof. Cecily Quinn Prof. David Gibbons Prof. Susan Kennedy Dr. Eoghan Mooney	4270 4733 4658 3851 4725 3851

Molecular Pathology Consultant Lead Consultant Neuropathologist	Prof. Niall Swan Prof. Aurélie Fabre Dr. Clare D'Arcy Dr Zornitsa Tsvetanova Fadden Dr Maura Cotter Dr. Aoife Maguire Dr. Lindsey Clarke Prof Leona Doyle Dr Erinn McGrath (Locum) Dr Catherine Connolly (Locum) Prof Adrian Marino-Enrique Prof. Michael Farrell	4798 3276 5101 5101 3852 6150 4725 3852 4788 5940 3337 01 8092631
NCHD's		4293/4799
Chief Medical Scientist	Mr John Harford	3855/4613
Laboratory Enquires		4330
Immunology (SVUH)		
Consultant Immunologist Clinical advice/ Interpretation	Prof. Conleth Feighery	4953
Chief Medical Scientist	Dr. Eleanor Wallace	4953
Laboratory Enquires		4598
Microbiology (SVUH)		
Consultant Microbiologists Clinical Advice /Interpretation	Dr Sinead McDermott Dr. Suzy FitzGerald Dr. Sinead McNicholas Dr Kirsten Schaffer Dr Lillian Rajan Dr Laura Ryan Dr Karina O'Connell Dr Una Sutton-Fitzpatrick	4972 4470 4852 4853 4470 4470 4470 4470
Microbiology Registrars		4949/4088/3196/3197
Chief Medical Scientist	Ms Orla Donoghue	4794
Infection Control Nurses		4948/4088/3196/3197
Laboratory Enquiries		4450/4470
Phlebotomy (SVUH)		
Senior Phlebotomist	Ms Miriam Hogan Mr Eddie Permalino Ms Sinead Bradshaw	4652 Bleep 154
Mortuary (SVUH)		
Senior Pathology Technician	Mr. Colin Howe	4238
Satellite Laboratory (SVPH)		
Laboratory Director	Dr Pat Twomey	4430
Consultant Haematologist	Dr Kamal Fadalla	3125
Consultant Chemical Pathologist	Dr Pat Twomey	4430
Laboratory Manager		4510
Chief Medical Scientist	Ms Rebecca Nolan	8397

SMH Laboratory (SMH)		
Laboratory Director	Dr Liam Smyth	SVUH Switch
Consultant Haematologists Clinical advice/ Interpretation	Dr Liam Smyth/ Dr Mark Coyne	SVUH Switch
Consultant Chemical Pathologist Clinical advice/ Interpretation	Prof. Carel Le Roux	SVUH Switch
Consultant Microbiologist	Dr Sinead McDermott	SVUH Switch
Chief Medical Scientist	Fiona Donohue	6639868
Quality Officer	Rachel O'Brien	SMH Ext 7388
Haemovigilance Officer/ Anticoagulant Nurse Specialist	Kate Strathern	SMH Ext 7406 or Bleep 7068
Laboratory Enquires		6639871
Appointments		6639871
Laboratory Porter		SMH 7201 or Bleep 7069

6.0 LABORATORY REQUESTS

6.1 Electronic Requests (Maxim OCS)

Requests for tests on patients in the Emergency Department in SVUH and other specific inpatient areas of the hospital are made electronically through Maxims Order Communications System (OCS). At the time of writing OCS is available in ED and selected wards within the Nutley wing, the plan is for full Hospital coverage.

Local instructions for use of OCS are available in clinical locations where OCS is used and training can be provided by contacting the ward training officer where available and / or the Pathology OCS Lead on cmooney@svhg.ie

NB Blood Transfusion is not included in OCS, conventional request forms and bloodtrack will be used.

6.2 Laboratory Request Forms

For all requests other than those identified for electronic requesting (refer to section 6.1), all samples must be accompanied by the appropriate laboratory request form. The laboratory has combined Blood Sciences (Haematology and Clinical Chemistry) request forms in addition to a number of different request forms which are colour coded for specific departments. There is also a specific request form for GPs to use. Please use the request form for the appropriate department/s. Multiple tests for one department can be sent on one request form but separate specimens and request forms are required if tests are being sent to different departments.

(Refer to section 6.3 for Completion of Blood Transfusion Request Form.)

The following request forms are in use in the Department of Pathology and Laboratory Medicine. Please ensure that the appropriate request form is used when sending samples to the Department. Please contact the relevant laboratory for further information if required.

Reference Number	Request Form Title	Use
General Pathology		
Maxim OCS	Maxim OCS	SVUH Emergency Department requests and specific SVUH inpatient locations– please use Maxim OCS for electronic requests
LF-GEN-REQBS	Blood Sciences Request Form	SVUH Inpatients/ Outpatients for Blood Sciences (Haematology and Clinical Chemistry Tests)
LF-GEN-REQGP	GP Request Form	All GP requests – Clinical Chemistry, Haematology, Immunology, Microbiology
St Vincent's University Hospital - Laboratory Specific Forms		
LF-BTR-001	Blood Transfusion Request Form	SVUH Patient requests
LF-HIS-CYTSPREQ	Cytology Request Form	SVUH Patient requests
LF-HIS-SPREQ	Histology Request Form	SVUH Patient requests
LF-IMM-REQ	Immunology Request form	SVUH Patient requests
LF-MIC-REQ1	Microbiology Request Form – General Culture	SVUH Patient requests
LF-MIC-REQ3	Microbiology Virology Request Form	SVUH Patient requests
St Vincent's Private Hospital – Laboratory Request Forms		
LF-SAT-REQFR1	SVPH Satellite Request Form	SVPH wards and Consultants Private Clinics for Satellite Laboratory Blood Sciences (Clinical Chemistry & Haematology)
LF-SAT-REQONC	SVPH Satellite Lab Request Form - Oncology	SVPH Oncology Services only (Day Care Oncology, Infusion Suite, Cedar and Cara Wards) for Satellite Laboratory Blood Sciences (Clinical Chemistry & Haematology)
St Michael's Hospital		
LF-GEN-0017	SMH General Laboratory Request Form	All Blood Science requests (Biochemistry & Haematology) for tests on SMH profile.
LF-GEN-0041	SMH External Test Request Form	All other Blood Science requests (for tests not on SMH profile); all Microbiology & Immunology requests.
LF-HIST-0001	SMH Histology Request Form	All Histology & Cytology requests from SMH
LF-BT-0024	SMH Blood Transfusion Request Form	All Blood Transfusion incl. DCT requests from SMH. Tracker back copy retained in SMH.
St Colmcille's Hospital		
LF-GEN-027	SCH Biochemistry/ Haematology Request Form	

For accurate identification of patients and specimens, it is essential that requests forms be completed fully, legibly and accurately. The use of patient addressograph labels on request forms is recommended. The essential information on the request form:
Patient's Full Surname and Forename
Patient's MRN (Medical Record Number). If a MRN is not available or relevant (i.e. GP patients) a date of birth and address must be supplied on the form and specimen label.
Patient's Date of Birth
Patient's Gender and Title
Date and time of specimen collection
Name of the Requesting Consultant
Location to where the results should be reported
Type of specimen collected and if appropriate, the anatomical site of origin or tick the relevant box
Name and bleep number of requesting doctor
Analysis required
At time of Phlebotomy / Collection, the name of the person collecting the sample and the date/ time should be added to the request form

If a specimen is urgent please indicate on request form and the request will be prioritised. If results are extremely urgent please contact the relevant department to discuss your requirement. Overuse of the urgent service will adversely affect the turnaround time for all urgent tests.
Clinical details and relevant treatment information are extremely useful to the laboratory in interpreting results.

Please remember that inadequate information on request forms makes it impossible to issue a hard copy report to the correct location or contact the doctor in case of urgent or unexpected results.

6.3 Request forms – Blood Transfusion Specific Requirements

The Blood Transfusion Request Form must be completed with the following information:
Patient's Surname (legible)
Patient's Forename (legible, initials are not acceptable)
Patient's MRN (pseudonumbers are not acceptable for blood transfusion samples)
Patient's Date of Birth
Date and Time specimen was taken – this is vital in establishing the validity of the sample for testing, storage and reuse
Test required
Blood/Blood Product required
Patient's Location and Consultant
Patient's Gender
Surgical procedure required and date and time required
Name and bleep of the requesting doctor
Patient's transfusion history
Reason for transfusion
Name of person taking the sample
Sign the section of the Request Form that the patient has been positively identified and their details checked with the wrist band.
Personal Digital Assistants (PDAs) are used in SVHG for transfusion sampling. PDA is a piece of equipment used to take a blood transfusion sample by scanning the patient's wristband which generates 2 patient labels containing all the above information that can be affixed to: (1) patient sample and (2) Sample taken by section on request form. If PDAs not available manual system can be used.

Patient's Surname (legible), Patient's Forename (legible, initials are not acceptable), Patient's MRN (pseudonumbers are not acceptable for Blood Transfusion samples), Patient's Date of Birth are minimum requirements for acceptance. Request forms not meeting minimum requirements may be rejected and unnecessary delays will result.

6.4 GP Request Forms

GP's are requested to use the GP request form which has been specially designed so that completing the top copy of the request form produces multiple carbon copies underneath. Please use ballpoint pen and ensure that the information provided is legible on all copies of this form. If using an addressograph label please place a label on each copy of the request form. If GP specimens are urgent please indicate this on the request form and provide phone numbers for phoning urgent results after normal surgery hours.

All GP samples must be accompanied by a fully completed SVUH GP request form. Requests which are not received on an SVUH GP request form will be rejected. Microbiology GP Microbiology specimens are referred to Enfer Medical. These must still be accompanied by a fully completed SVUH request form. Requests which are received without clearly completed requesting clinician/ location will be rejected.

Stocks of the SVUH GP request form can be ordered as section 7.5 below.

If necessary, there is a PDF printable copy of the SVUH GP request form available in the Department page of the St Vincent's University Hospital website www.stvincents.ie. However please note that this is a PDF document for printing and completing by

hand by the GP before the patient proceeds to phlebotomy. Electronic copies of this request form will not be accepted by Phlebotomy.

Please state date and time of sample collection on the request form.

Blood Transfusion Samples from GP's
The laboratory does not provide a blood grouping and antibody screening service. Ante-natal samples for blood group and antibody screen should be sent directly to the patient's maternity hospital blood bank.

6.5 GP Registration for services

GPs who access the services of the Department of Pathology and Laboratory Medicine must be registered with our system in order to send samples for analysis.

We provide patient results to GPs via Healthlink electronic reporting. If you are a new GP to our services, or if you are changing practice or contact details, please ensure that you have registered with the department. Please complete the GP setup form for registration. This is available on the department page of the St Vincent's University Hospital website www.stvincents.ie . **Please do not send any samples to us until your registration is completed and confirmed**.

Note registration requires the provision of a GP mobile phone number. On rare occasions, the laboratory may need to contact a GP outside of normal office hours (but usually within the times of routine laboratory service 8am to 8pm weekdays, and 9am-1pm Saturdays) to communicate a significantly abnormal or critical result. Your mobile phone number will only be used for these communications of critical results.

7.0 SPECIMEN CONTAINERS

Blood Tubes are available with different anticoagulants and the cap colour indicates the anticoagulant present.
It is important to use the correct specimen container and to take the sample at the appropriate time. If more than one blood specimen is taken, specimens must be taken in a particular order.

Below is a quick guide to the container type and the correct draw order. Further details can be found at the end of this document in Appendix 1: Test Requirements.

Pre heparinised syringes are available for blood gas analysis. A specimen cap is provided with each syringe and should be placed on specimen prior to bringing to the laboratory. Specimens **must not** be sent to the laboratory with needles attached. Samples for Blood Gas analysis should not be sent on the pneumatic tube.

Blood Gas specimen for lactate analysis should be placed on ice and brought to the laboratory immediately.

7.1 Blood Specimen Containers

BD Vacutainer®

BD Life Sciences - Preanalytical Systems

Cap Colour	Cat. No.	Tube Type	Determinations	Special Instructions	
		Blood Cultures	If insufficient blood for both culture bottles, use aerobic bottle only. Using a needle-protected butterfly needle collect aerobic (green) bottle first and then the anaerobic (purple) bottle. If using a syringe then the anaerobic bottle is taken first and then the aerobic bottle. Blood Culture bottles should be available on all wards. A supply is available from Microbiology Reception (Mon – Fri)		
	Cat. No. 363095 / 363093 Draw Volume 2.7ml / 1.8ml	Sodium Citrate	Coagulation Testing, PT, INR, APTT, D-Dimer, Thrombophilia Screens, Factor Assays	If using a butterfly needle, and if coagulation testing is the first sample to be drawn, please use a discard tube first.	Mix 3-4 Times
	Cat. No. 367837 Draw Volume 6ml	Serum	LDH, NT-pro BNP, Drugs (Lithium, Phenytoin, Theophylline, Methotrexate, Valproate, Carbamazepine, Paracetamol, Salicylate, Digoxin, Tobramycin), Ionised Calcium, Vitamin D, Parathyroid Hormone, Osmolality, Bone Markers, Endocrine Testing (excluding Thyroid)		Mix 5-6 Times
	Cat. No. 367954 Draw Volume 5ml	SST™ II Advance	Growth Hormone, ADNA, Gastrin, Electrophoresis, Immunoglobins (IgG, IgM, IgA, IgE), β_2 Microglobin, Ceruloplasmin, Infectious Mono, Thyroid Ab, Liver Ab, Rheumatology, Coeliac Ab		Mix 6 Times
	Cat. No. 363380 Draw Volume 6ml	Trace Element (Serum)	Zinc, Copper and Selenium	Navy cap with red stripe on label	Mix 8-10 Times
	Cat. No. 367375 Draw Volume 4.5ml	PST™ II	UE, LFT, Creatine Kinase, Ca, Mg, Phosphate, Uric Acid, Total Protein, Amylase, Lipids, Bone Profile, Troponin T, Iron Studies, ACE, CRP, TSH, FT4, T3, Cortisol, Vitamin B12, Folate, Ferritin, PSA, Free PSA, CEA, AFP, HCG, CA125, CA19.9, CA153	One full plasma gel tube is sufficient for all the tests in this group	Mix 8-10 Times
	Cat. No. 367838 Draw Volume 3ml	EDTA	Full Blood Count (FBC), ESR, C3/C4, Haemoglobin A1c, Homocysteine, ACTH, Sirolimus, Tacrolimus, Cyclosporin, PCR for CMV, HIV, EBV and Haemochromatosis Genetics, Lymphocyte subsets (CD4/CD8/CD19)	Homocysteine and ACTH should be taken cross ref. Same time specimen taken. One tube for FBC and ESR. Separate tubes for each of the other tests in this group	Mix 8-10 Times
	Cat. No. Draw Volume	EDTA Crossmatch	Group, Crossmatch		Mix 8-10 Times
	Cat. No. 368381 Draw Volume 6ml	Trace Element (EDTA)	Chromium and Cobalt	Navy cap with purple stripe on tube	Mix 8-10 Times
	Cat. No. 368920 Draw Volume 2ml	Fluoride Oxalate	Glucose and Ethanol		Mix 8-10 Times

Determinations and Special Instructions contained within this guide have been provided by the named institute and are not BD recommendations or instructions for the BD products described. Please consult your organisation's guidelines or contact BD should you have any questions.

*Clinical and Laboratory Standards Institute (CLSI) Guidelines GP41, M29 (formerly H3-A6, H4-A6 Editions)

IMPORTANT MIXING GUIDELINES

All BD Vacutainer® tubes require immediate mixing following collection. Insufficient mixing can result in inaccurate test results and the need to re-draw. Correct mixing technique is to gently invert (180° and back) each tube the recommended number of times shown on the right hand side of the table.

0118 921 6000
1030 Eskdale Rd, Winnersh, Wokingham RG41, UK

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ST. VINCENT'S UNIVERSITY HOSPITAL Elm Park

BD

7.2 Histology Specimen Containers	
Histology Biopsy Formalin Pots	Available from Pharmacy SVUH or Pathology SMH
Theatre buckets containing formalin	Adequate volume of formalin is essential for proper fixation. The volume of formalin recommended is ten times the volume of the tissue to be fixed.
Cytolyt available from Cytology SVUH or Pathology SMH	Fine needle aspirate (FNA) and needle rinse
Dry Containers 60 mls/ 300 mls	Fresh specimens for frozen sections, breast margins, serous fluid, cerebrospinal fluid (CSF), bronchial samples, urine for cytology All unfixed tissue should be transported to the laboratory immediately and staff alerted.
Saline Moistened Fine Gauze	Use for muscle biopsies and nerve biopsies for enzyme histochemistry and skin biopsies for Direct Immunofluorescence (DIF). Please bring specimens to the histology laboratory immediately and alert staff.
White capped plastic container (30 mls) containing saline	Kidney biopsy for DIF – Please bring specimens directly to Histology
Sterile container 70 mls (yellow lid) available in theatre and Microbiology	Tissue for culture Do not add formaldehyde
Air Dried Smears on slides	Thyroid FNA
Preservcyt available from Cytology SVUH or Pathology SMH	Brushings for Cytology (Common bile duct, Bronchial, Oesophageal)
7.3 Urine Specimen Containers	
Sterile plastic container (30 mls) White Cap	Sterile plastic universal container (30mls) This specimen container can be used for urine, fluid samples including CSF, ascetic, peritoneal, synovial, joint, sputum, tissue for culture (do not add formaldehyde).
24 hr urine (plain)	24 hr urine container with no preservative.
24 hr urine (acid)	24 hr urine container with 10mls of concentrated hydrochloric acid added. Containers supplied by Clinical Chemistry Laboratory. The container will be marked with corrosive warning signs.
24 hr urine (acid washed)	24 hr urine container washed with 10 mls of hydrochloric acid. The container will be marked with hazard warning signs.
Bone Markers Urine	250 mls plastic bottles available from Metabolism laboratory

7.4 Other Specimen Containers	
Sterile plastic container (30 mls) White Cap	Specimen container with no preservative, which should be used for: urines, fluid samples including CSF, ascitic, peritoneal, synovial, joint sputum tissue for culture; Do not add formaldehyde
Sterile plastic Universal Containers 30 mls (blue cap) with spoon	Faeces samples (only).
Sterile transport Swabs	Use for all swabs including screening. A supply of sterile transport swabs are available on all wards and stock supplied from CSSD.
Virus Transport Medium	All swabs for virus culture or PCR should be sent in liquid virus culture medium (UTM – red top tube). These are supplied by the microbiology reception. Please check with microbiology laboratory before taking samples as there may be special requirements for particular investigations. Do **NOT** send blue top eNAT swabs for any virus other than SARS-CoV-2, Influenza and RSV.
SARS-CoV-2, Influenza and RSV Testing	Nasopharyngeal samples should be taken using an eNAT swab (blue top). These are supplied by the microbiology reception. Do **NOT** use these swabs for any other virus.
Hema screen slides	Use for Faecal Occult Blood analysis. Slides available from Clinical Chemistry. Only hema-screen slides accepted.
Heparin and RPMI medium in sterile plastic containers 30 mls	Available from Haematology for Bone Marrow Samples for Immunophenotyping, Cytogenetic Studies and Molecular Markers. **Please Contact Immunophenotyping laboratory (ext 4792) before taking samples**.
APTIMA CONTAINERS	PCR for Neisseria gonorrhoea and Chlamydia. Urine or swab. Available from Microbiology Laboratory.
Transfix CSF tube	Use for CSF samples requiring Flow cytometry. Minimum volume of 2-3ml required.

7.5 GP Stock Orders

For SVUH GP users, GP requests for stock items (blood tubes, specimen containers, request forms etc) are done through the company Durbin. Please contact Durbin directly:

Durbin Ireland:
Email: bdorders@durbinireland.ie

A copy of the SVUH GP Stock Orders form can also be obtained from Durbin.

Durbin will send the supplies directly to the GP practice.

8.0 PHLEBOTOMY

8.1 Patient Identification

8.1.1 Identification of the conscious/coherent In-Patient

To correctly identify an inpatient, the phlebotomist must:
Ask the patient to state their name and their date of birth
Check this information matches that on the request form / Maxim OCS electronic order
Check patient's name and MRN on request form / Maxim OCS electronic order with name and MRN on patient's identification band. All data should correspond.
If the patient is not wearing a wristband, do not take the sample. The nurse in charge must be contacted to provide one, or the phlebotomist may print one, before the blood sample is taken
If any of the information does not correspond, the nurse in charge must be contacted to clarify and amend the details before any blood samples are taken.
Only when you are satisfied that the patient has been fully identified take the blood sample.

For Blood Transfusion samples, patient ID band must be scanned using the PDA device and PDA patient label affixed to the 'Sample Taken by Section on Request Form'. In the exceptional circumstance when the PDA is not used, the person taking the sample must sign the section of the Request Form / Maxim OCS electronic order that the patient has been positively identified and their details checked with the wrist band.

8.1.2 Identification of the unconscious/incoherent In-patient

To correctly identify the unconscious patient, the phlebotomist must:
Read the details written on the request form
Compare the details to those on the patient's wristband
Confirm patient's identity with staff nurse or carer.

Refer to 8.1.5 for Blood Transfusion Specific requirements

8.1.3 Unidentified Patient

Unidentified unconscious patients are identified with the ED Attendance Number, MRN and gender.
Request forms and specimens are completed as follows:
Forename: UD
Surname: Male and ED **Attendance** number (or Female and ED **Attendance** number).
MRN, Sex and pseudo DOB (01/01/1901) as on the patient's record

This system ensures that unidentified unconscious patients are identified by two unique identifiers.
Refer to 8.1.5 for Blood Transfusion Specific requirements

8.1.4 Identification of the Outpatient

To correctly identify an outpatient, the phlebotomist must:
Ask the patient to state their name
Ask the patient to state their date of birth.

It is essential that the patient identify himself or herself to the satisfaction of the phlebotomist. Any queries regarding the request should be made to the requesting doctor.

8.1.5 Blood Transfusion requirements for unconscious/ unidentified patients

Unconscious Patients

In SVHG, if the patient is unconscious, confused or unable to state his / her name and date of birth, identify the patient via the ID band, the medical notes and the request form.

Unidentified Patients in the Emergency Department (either single or multiple but not in the context of a Major Disaster)

Adhere to the following when requesting an emergency crossmatch for unidentified patients:
Request form must be handwritten
Forename: UD
Surname: Male and ED **Attendance** number (or Female and ED **Attendance** number).
MRN, Sex and Pseudo DOB (01/01/1901) as on the patient's record

In the event of a Major Disaster where there are multiple unidentified casualties, pre assigned hospital records will be used. These will not have an A&E Incident number until they are registered on MAXIMS so we will not be able to use the usual format in these cases.

Forename: MIMMS
Surname: a pre-assigned 4 digit MIMMS number
MRN
Sex and pseudo DOB (01/01/1901) as on the patient's record

This system ensures that unidentified patients are identified by 2 unique numbers. The approximate age should also be supplied to facilitate blood selection.

8.2 Obtaining Consent

Consent to take the blood sample is obtained from the patient. The procedure and reasons for it are explained to the patient, who then makes a decision to either give consent or refuse. Informed consent may be verbal or non-verbal e.g. patient extending arm or rolling up sleeve. Should the patient be unable to communicate, the phlebotomist should seek assistance in explaining the procedure to the patient from a carer who is familiar with the patient. The patient should understand the procedure before it is carried out. If the patient refuses to give the sample it is important that the phlebotomist notifies the nurse in charge, or the medical team looking after the patient. Document the refusal on the request form and sign and date.

Where a consent form is required to be signed by a patient, information for these specific tests is indicated in the test requirements in Appendix 1 e.g. prior to collection of samples for genetic testing or for research. It is the responsibility of the treating surgeon or clinician to obtain and document informed consent for genetic testing, in accordance national regulations and policies. In these cases, an explanation of the clinical procedure may be required to enable informed consent, along with more detailed explanations such as the importance of the provision of patient or family information.

Specific consent is required for patients receiving transfusion of blood or blood products. Informed written consent regarding the relative risks, benefits and alternatives to blood transfusion must be obtained by the doctor from the intended transfusion recipient by using the SVHG Consent for Transfusion of Blood/Blood Products Form. The document PIL-ORG-1 contains both the patient information leaflet and the consent form, and is available to the doctor obtaining consent from hospital Q-pulse.

8.3 Phlebotomy Procedure

All equipment to be used in the collection of the sample should be prepared in advance. This includes:
Tourniquet
Needles/ butterflies.
Vacutainer Holders
Necessary Blood Tubes
Alcohol Swabs
Gloves/standard precaution equipment
Cotton wool/ gauze dressings.
Tape/Plasters
The request forms for the patient
Alcohol hand gel.
Azo wipes.
Pen
I.V. tray with signed and dated Sharps Bin, or trolley with injection tray and large sharps bin within reach.

All items should be carried on clean I.V. tray to the patient's bedside. All equipment should have its expiry dates and sterility seals checked before usage.

8.3.1 Use of a Tourniquet

The tourniquet should be applied approximately 10cm above the intended site of the venepuncture.
It should be applied tightly enough to constrict the veins, but not so as to obstruct the arterial flow to the limb. The pulse should be palpable below the level of the tourniquet

If the limb becomes cyanosed (blue in colour) then the tourniquet has been in situ for too long, or it is too tight and must be released immediately.
The tourniquet should not be in situ for longer than 1 minute as haemoconcentration occurs.
If more time is necessary to find a vein, then the tourniquet should be loosened to allow normal blood flow to resume for a minute and then reapplied before venepuncture is carried out.
As soon as blood flow starts, the tourniquet should be released, but it may be lightly reapplied should the flow diminish.
At no point should the tourniquet cause the patient pain
Tourniquets must never be placed over a wound or a dressing.
Only use approved tourniquets. Rubber glove should not be used as a tourniquet.

8.3.2 Choice of a Site for Venepuncture
In S.V.H.G., phlebotomists are restricted to accessing the veins of the arms and dorsal hand veins. Veins of the lower limbs and the anterior area of the wrist are not approved sites for access by phlebotomists
The antecubital area is the preferred site for venepuncture. Here, the median cubital, cephalic and basilic veins lie close to the surface. This area should be examined first and then the dorsal veins of the hand are considered. Veins are palpable, well defined but compressible. A vein will have a bounce to it and can be easily distinguished from tendons and muscles. Arteries will pulsate. Do not select a vein that overlies an artery. Veins collapse on the removal of the tourniquet, arteries do not.
Deeply situated veins may be found by careful palpation and are often the most suitable veins for venepuncture. Closing the fist **lightly** will increase the chance of finding a suitable vein however continuous pumping or clenching is to be avoided as this can cause distortion of results.
Veins that lack resilience or feel hard may be sclerosed or thrombosed, and should be avoided.
Veins close to the site of infection and areas of bruising should also be avoided.
The anterior veins in the wrist are not to be used for blood collection, due to the proximity to adjacent arteries and nerves.

8.3.3 Procedure for Venepuncture
The patient's arm should be kept straight, in a downward position, with the wrist extended. Support of a pillow may be required.
Hands must be washed/or alcohol gel applied and gloves must be worn for venepuncture procedure.
Tourniquet is applied, site of venepuncture is chosen. Tourniquet is then loosened and skin cleansed with alcohol swab, in a clockwise direction from within outwards.
Equipment is assembled as skin is allowed to dry.
Tourniquet is retightened for not more than 1 minute.
The barrel of the blood collection system is held between the thumb, index and middle finger. The other fingers are tucked out of the way. Stretch the skin below the intended site with the free hand to anchor the vein and reduce discomfort.
Instruct patient to lightly close fist – **no clenching or pumping**. (This can lead to false raised potassium results).
The needle is held at an angle of 15°C to the patient's arm with the bevel of the needle facing upwards and in line with blood flow direction. A slight "give" may be felt when needle enters the vein.
With the barrel firmly anchored advance the sample tube on to the multisampler valve on the back of the needle using the flange of the barrel to prevent needle from advancing in the vein.
When blood flow commences the tourniquet is loosened and patient instructed to open fist. If flow is inadequate tourniquet may be lightly reapplied.
The tube should be filled in correct order of draw until vacuum is exhausted and blood flow ceases.
Remove the tube by bracing the thumb against the flange of the barrel.
A 21g needle is the recommended size for blood collection. However a 23g needle or blood collection set may also be used.
Avoid changing hands unnecessarily while taking blood as this can displace the needle causing pain and trauma to the patient.
When blood has been collected, each tube must be gently mixed, by fully inverting the tube 5 to 8 times avoiding vigorous shaking.
Release tourniquet fully prior to removing needle
The last tube must be removed from the holder before the needle is withdrawn from the vein.
Safety device is activated immediately prior to or on withdrawal, depending on device used. Activate as close as possible to puncture site.
Sharps are immediately disposed of in puncture resistant bin.
Place a gauze/cotton wool swab lightly over the site as the needle is withdrawn, with pressure
once the needle is fully removed.
Pressure should be maintained until the bleeding has stopped. Patient may do this if possible.
Samples are labelled in the presence of the patient. It is essential to label specimens before leaving the bedside. Sample tubes must never be pre labelled.
The arm may be elevated to encourage haemostasis but bending of the arm should be discouraged as it can lead to bruising.
All used equipment is disposed of appropriately.

When the blood has been collected and the samples labelled appropriately, the tubes must be placed in the leak-proof carrier section of the request form. It is the responsibility of the person taking the blood specimen to ensure that the correct tube for the requested samples are used. It is also essential that the tubes are placed in the carrier section of the corresponding laboratory request form, ensuring that the correct tubes are sent to the correct laboratory. Special requirements for transport, e.g. temperature/ light sensitivity, urgent, etc. must be adhered to as per Pathology User Handbook Part 2 Test Information and individual laboratory protocol sheets.

8.3.4 Disposal of Equipment

All equipment must be disposed of appropriately according to hospital policy.
All sharps, both contaminated and unused must be disposed of in a Yellow SHARP PROOF container, properly assembled, signed and dated.
All non-sharp, clinically contaminated materials must be disposed of in a yellow clinical waste bin.
General un-contaminated waste, including gloves, must be disposed of in a clear general waste dustbin.
Gloves, where visibly contaminated, must be disposed of in a clinical waste bin.
Protective clothing, aprons, gloves etc from barrier rooms must be disposed of in clinical waste bins.
When disposing of needles and blood collection sets, ensure the safety protection cap has been engaged fully, before placing in a sharps container.
Do not over fill sharps containers.
Always attach traceability tag and sign sharps bin before disposal.

8.4 Haemolysed Samples

Factors in performing venipuncture, which may cause haemolysis include:
Using a needle with a small diameter (e.g. 23 gauge or more)
Using a small needle with a large vacutainer tube.
Using an improperly attached needle and syringe so that frothing occurs as the blood enters the syringe.
Pulling the plunger of a syringe back too quickly.
Shaking or vigorous mixing of blood collection tubes.
Forcing blood from a syringe into a blood collection tube, especially through a needle.
Failure to allow the blood to run down the side of the tube when using a syringe to fill the tube.
Failure to allow alcohol swab to dry
Drawing from site of haematoma
Very slow flow into tube
Drawing blood from indwelling line

8.5 Draw Order for Blood Specimens

If several different blood samples are required from one patient it is important that the specimens taken in the following order:
Blood culture bottles. Using a needle-protected butterfly needle collect in the **aerobic (green)** bottle first (8 - 10mls of blood draw) and then the **anaerobic (purple)** bottle. If using a syringe then the anaerobic bottle is taken first and then the aerobic bottle.
Citrate tubes (Light-Blue topped, for coagulation studies)
Dry tubes (Red topped) for tests on serum.
Gel tubes (Gold topped) with clot activator and gel for serum separation
Heparin tubes (Green-topped)
EDTA tubes (Lavender-topped, for full blood counts) (Pink-topped for group, crossmatch)
Fluoride/oxalate tubes (Grey-topped, for glucose)
Navy topped, with Red Stripe on the side of the label, for Zinc, Copper and Selenium.
Navy topped with Blue Band on the top of label, for Chromium and Cobalt.
Gently mix specimen containers immediately following collection by inversion five times.
Materials used in the sample collection must be disposed of according to the hospital policy and risk management guidelines.

8.6 Advice for Patients Attending Phlebotomy for Blood Tests

Patients attending the Anticoagulant Monitoring Service (AMS) should go to the clinic in the Herbert Wing (Ground floor, Old Private Hospital), which is opened between 8.00am and 11.00 am.

Outpatients and GP patients for blood tests should proceed to Phlebotomy in Ambulatory Day Care Centre on the first floor of the Clinical Services Building.

The service is open between 8am and 6pm Monday and Wednesday, and 8am – 5pm Tuesday, Thursday and Friday.

Outpatient and GP patient Phlebotomy is by appointment only. Appointments should be booked online using the Book OPD/ GP Blood Test option on the St Vincent's Hospital Web page www.stvincents.ie. Alternatively, Patients can make an appointment by phoning 01 291 6188 between 12-2pm Monday to Friday.
Please Note: phlebotomy will not take bloods for Quantiferon testing on Fridays. If Quantiferon testing is required please book appointment Monday-Thursday only.

Patient referred from clinics within ADCC should take a ticket at dispenser and wait in the seated area until your number is called. When your number is displayed proceed to the phlebotomy room with your ticket and a phlebotomist will take your bloods.

Patients must attend their phlebotomy appointment with the relevant request from, completed by their GP/ Clinician. Phlebotomy cannot be carried out without an appropriate request form.

The service is available to patients who are over 14 yrs old.
Patients who are fasting should only drink water before the blood test.
The results of all blood tests are forwarded directly to your GP and/or consultant.
Patients / Clinicians who are dropping off a specimen can use the Pathology Specimen Collection Box located in the Main Reception area of the ADCC (near the main hospital entrance)

Procedure in St. Michael's
GP Referrals are by appointment only. Phone 6639871 for appointment.
Patients from SMH Diabetic Clinic have appointments made on leaving the clinic.
Phlebotomy appointments are made for Mondays at least 2 weeks prior to their diabetic clinic appointment.
Anticoagulant clinic is held Tuesday mornings. Patients receive subsequent appointment by post following their visit.
Patients attending clinics in SMH, where possible and if clinically required, may have their samples taken following their OPD appointment.
Patients who are dropping off a specimen can go directly to the pathology reception located in Phlebotomy.

9.0 SPECIMEN COLLECTION AND COLLECTION INFORMATION FOR PATIENTS

9.1 Phlebotomy

Phlebotomy procedures are described in section 8 above

9.2 Collection of Blood Culture Bottles

Two bottles are required - A **green** top (**aerobic)** and a **purple** top (**anaerobic)** bottle.

Wash hands thoroughly and put on gloves. Remove the plastic flip top and sterilize the exposed rubber cap with an alcohol swab. Allow alcohol to dry.
Do not use disinfectants such as iodine or chlorhexidine for this purpose.
Clean the venipuncture area with Mediswabs, beginning at the centre of the site and scrubbing in a circular motion outwards to a diameter of three or four inches for about 30 seconds. Do not go back over the previously scrubbed areas. The alcohol washing might have to be repeated, depending on the cleanliness of the skin. Allow the alcohol to dry. Do not touch the venepuncture area after this.
Using a needle-protected butterfly needle and blood culture adaptor cap, push in the **aerobic (green)** bottle first (8 - 10mls of blood draw) and then the **anaerobic (purple)** bottle. This sequence will prevent the air in the butterfly tube from entering the anaerobic bottle. If using a syringe then the anaerobic bottle is taken first and then the aerobic bottle.
Label each bottle with the patient's name, hospital number, and date and time of collection.
Do not remove bar code stickers from blood culture bottles as these are required for laboratory processing.
Send the bottles in the bag attached to the yellow microbiology request form to the microbiology laboratory during normal working hours or be place the special On-Call box in Haematology out of hours - Blood culture bottles should never be placed in the fridge.
Contact the microbiology laboratory for further information.

Procedure in St. Michael's
Blood cultures taken in SMH should be sent out from SMH to SVUH within 4 hours of collection. Out of hours, contact Nursing Administration to arrange packaging and transport of samples via SMH Switch.

9.3 Patient Information for Oral Glucose Tolerance Test

Principle: The oral Glucose Tolerance Test involves the taking of two blood samples; one when you arrive (**fasting for 8-14 hours**) and one 2 hours after a glucose drink.

Procedure: After the fasting blood has been taken and after you have taken the glucose drink, you will be required to remain in the hospital for 2 hours, after which time the second blood specimen will be taken.

Throughout the test (the 2 hours between the two blood samples), please observe the following:
No Food

No Drink
No Smoking
No Exercise
Please report back to the Phlebotomy Outpatient Department in time to have your second blood sample (2 hours after glucose drink) taken.

9.4 Protocol for Oral Glucose Tolerance Test (OGTT) in OPD/ CF Centre

Ensure patient has been fasting overnight for between 8 and 14 hours.

Record factors that may influence interpretation of results e.g. medications, infection, inactivity etc

Take blood sample for glucose analysis (grey-topped tube). Label tube with the time of collection and as Fasting (F). Record this information on the Blood Sciences request form. Hold fasting sample until second sample is obtained.

The glucose load* is then given. Instructions on preparing the glucose drink are available from the Clinical Chemistry Department. The glucose drink should be consumed over a maximum of five minutes. Timing of the test starts at the **beginning** of ingestion.

After ingestion, instruct the patient **not to eat, drink, smoke or exercise** and to return just before two hours has elapsed since the glucose load. Please give the patient a copy of the OGTT patient information sheet (**LF-BIO-OGTT-INFO**).

After exactly 2 hours since the ingestion (beginning) of the glucose load, take a second sample for glucose analysis and label tube with the time of collection and as the 2 hr sample. Record time on request form. Check that the patient has not vomited within the 2 hours- record on request form if patient has. The fasting and the 2 hr sample should be sent to the Clinical Chemistry Department together, attached to the same request form on which **OGTT** should be clearly stated.

Further information on the Oral Glucose Tolerance Test may be obtained from the Clinical Chemistry Department.

* Polycal (tetra pack), cat no 18883, Nutricia Clinical Care, UK

For in-patients OGGT polycal is ordered from pharmacy on the day prior to the test.

9.5 Patient Instructions for making a 24-hour Urine collection

Important points
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 but into a suitable clean detergent-free jug and then pour into the 24-hour container.
Ensure that the container is labelled with patient's full name, date of birth and address, date and time collection of specimen started and finished.
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.

If this container contains acid as a preservative and/or has a warning label, then care needs to be exercised when adding urine to it from your collection vessel. The following points should also be noted: Hydrochloric Acid (fuming liquid) causes burns and is irritating to eyes, skin and respiratory system. If in contact with skin, wash immediately with plenty of water and seek medical advice. Keep out of reach of children. Not to be taken internally – would cause severe irritation and damage. A member of the Clinical Chemistry Staff will explain the procedure to you and give you an information leaflet. Please read the information sheet carefully.

Procedure:
Empty your bladder at 7am on rising (or at a more convenient time) and **throw away** the sample. Only **after** this sample has been passed is the collection started. Write start time on container label. Collect all your urine in the container provided on **every** occasion that it is passed during the following 24 hours and store refrigerated if possible. Empty your bladder at 7am on rising the next morning (or at the more convenient time chosen) and add this sample to the collection. Write the finish time on the container label. Please ensure that the label on the container and the request form are fully completed and that the cap is closed securely. Bring the collection to the hospital on the day of completion.

Incomplete Collections:
If you forget and lose a sample down the toilet, then please throw away all the urine collected up to that time and start again the following morning.
If you are making an acid collection, return the container with the acid to the laboratory and request a new container from the laboratory.
Clinical Chemistry Department, St Vincent's University Hospital, Elm Park, Dublin 4.Tel: 01 2214550

9.6 Patient Instructions for collection of specimens for Microbiology

Prolonged delays in receipt of samples to the laboratory, improper storage of specimens before receipt in the laboratory and/ or quality of specimen taken may affect test results.

9.6.1 Patient Instructions for Collection of Mid-Stream Urine (MSU)

A Mid stream urine is tested to establish if a patient has a urinary tract infection (UTI)
Tips before passing a sample of urine:
Do not empty your bladder for three hours, if possible. Ensure the container is labelled with your surname, first name, date of birth, date/ time and referring doctor. (The sterile container will be provided by your doctor). Do NOT use an un-sterile container e.g. a tablet container. These will be rejected in the laboratory.
Wash your hands, and if possible wash your genital area with soap and water. The aim is to get a sample of urine from the middle of your bladder. Urine is normally sterile (no bacteria present). If bacteria are found in the sample, it means you may have a UTI. A 'mid-stream' sample is the best sample as the first void of urine passed may be contaminated with bacteria from the skin. Do not open the sterile container until you are ready to take the sample.
Pass some urine into the toilet. Without stopping the flow of urine, catch some urine in the sterile container (fill approx. half full). Finish off passing urine into the toilet. Close the lid tightly. Place container into biohazard bag attached to the request form and seal bag. Wash hands thoroughly with soap and water.
Check that the request form contains **the full name; address and date of birth** of the person sampled and add the **date the sample** was taken. The sample should ideally be brought to the doctor's surgery or the lab within two hours. If that is not possible, put the sample in the fridge until it is brought to the surgery or lab. A result will be available after 2-3 days and will be sent to the patient's doctor.
The quality of urine sample taken, prolonged delays in transport to the laboratory and/ or improper storage of sample before receipt in the Microbiology laboratory can affect test results.

9.6.2 Patient Instructions for Collecting a Faeces / Stool Sample

The purpose of a faeces/ stool test in Microbiology is to detect if a patient has a bowel infection.
Tips before passing a sample of faeces/ stool:
Label the container (30ml universal container with blue lid) with your surname, first name, date of birth, date/ time and referring doctor. Make sure there is no trace of disinfectant or bleach present in the lavatory pan or potty, as this will interfere with the test. Faeces (a bowel movement) should then be passed. Open the container. Using the little spoon provided, scoop up 2 spoonfuls of faeces and place in the container. There is no need to fill the container. Screw the lid tightly back on the container. The container with the stool sample should be placed in the biohazard bag attached to the form and sealed.
Wash your hands thoroughly with soap and water.
Check that the form contains the **full name, address and date of birth** of the person sampled and add date the sample was taken. The sample should ideally be brought to the doctor's surgery or to the lab as soon as possible. If there is an unavoidable delay in transport, the sample should be refrigerated prior to transportation. Quality of sample, incorrectly stored sample and/ or prolonged delay in transport to the lab may affect test results.
Results will be sent to your doctor within 3 working days.

9.6.3 Patient Instructions for Collecting a Sputum Sample

Ensure the specimen container and request form are labelled correctly with your name (first and last), date of birth or hospital number, the date and time of collection Incorrectly or incompletely labelled specimens will not be tested.
The ideal time to collect the specimen is early in the morning just after getting out of bed. However the specimen may be collected at any time sputum is available to be produced. **DO NOT** use mouthwash or brush teeth with toothpaste immediately before collection. Gargle and rinse your mouth thoroughly with water.
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. Saliva is not a suitable specimen for examination. 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. Place specimen in biohazard bag attached to 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.
Specimens for TB testing: 3 specimens are usually required. Take the specimens on 3 consecutive days. The ideal time to collect the specimens is early in the morning just after getting out of bed.
Collect and transport all specimens as described above

10.0 SPECIMEN LABELLING

10.1 General Requirements

(Refer to section 10.2 for Labelling of Blood Transfusion Samples.)

Electronic Orders:
All samples ordered electronically through Maxim OCS must be labelled with a Maxim OCS specimen label. All details on the label must be correct and clear. The label must be positioned in the middle of the tube and not obstruct the sample window.

The Maxim OCS electronic order label will automatically print both the Responsible Healthcare Professional (HCP) who made the order, and the staff member collecting the order, along with the date and time of collection.

Orders on Request Forms:
All laboratory specimens **must** be labelled clearly and legibly with a **minimum** of two acceptable identifiers. The acceptable identifiers are **Patient's Full Name and either MRN or Date of Birth**; All identifiers must be correct and complete. **Specimen tubes must be labelled immediately after they are drawn and must never be pre-labelled.** These criterions for sample acceptance are essential for patient safety and are in place to reduce the risk of potential harm caused by labelling errors. The policy is strictly enforced and specimens not meeting the minimum criteria will be rejected.

Large addressograph labels **must not** be used on specimens with the exception of Histology and Cytology specimens where the use of an addressograph label is recommended. When the printed label is too big it obscures the sample from view and may also cause equipment failure due to jamming of the system.

Small printed labels (e.g. those used in A/E) may be used on samples with the **exception of Blood Transfusion Samples**. These small labels should be placed directly over the original container label so as not to obscure the sample.

In addition, the name of the person collecting the sample should be recorded on the request form with the date and time of collection.

Specimens of 24 hr urine collections must be clearly labelled with the patient's name, hospital number, date and time collection commenced, date and time collection finished, and test required. It is not sufficient to stick the request form on the bottle. The urine collection should be kept refrigerated during collection and brought to the laboratory on the same day that the collection finishes.

All 24 hr urine collection bottles which have acid added as preservative must also be labelled with a corrosive sticker.
Timed urine collections should have both the starting time and finishing time of urine collection.

Blood Gas specimens must never be sent to the laboratory with a needle attached.

Specimen containers that are externally contaminated with body fluids should not be sent to the laboratory and may be discarded.

10.2 Labelling Blood Transfusion Samples

Addressograph labels **MUST NOT** be used on transfusion samples **ONLY PDA PATIENT LABELS**.

Personal Digital Assistants (PDAs) are used in SVHG for transfusion sampling. PDA is a piece of equipment used to take a blood transfusion sample by scanning the patient's wristband which generates 2 patient labels containing all the above information that can be affixed to: (1) patient sample and (2) Sample taken by section on request form. If PDAs not available manual system can be used.
In the exceptional circumstance when the PDA is not available, write the following information from the patient's wristband legibly on the sample tube **before leaving the bedside**
Patient's Surname (in block capitals).
Patient's Forename (in block capitals, initials are not acceptable).
Patient's Hospital number.
Patient's date of birth
Signature of person taking the sample.
Date/Time the sample was taken.

Samples not meeting the above criteria will be rejected. The person who took the sample will be informed of this decision and the reason why. These policies are in place to ensure compliance with EU Directive 2002/98/EC. The hospital blood bank staff has been instructed by the Hospital Transfusion Committee to enforce these policies.

10.3 Labelling Histology and Cytology Samples

For Histology and Cytology samples, the request form and body of the container must be labelled with the patient's full name, MRN (or DOB) and specimen details, use addressograph labels if possible. If more than one site is sampled on a patient, a specimen container is used for each site, with the site clearly identified on each container.

Cytology slides submitted to the laboratory must be labelled in pencil with the patient's full name and MRN (or DOB). This information is the minimum requirement for specimen acceptance.

11.0 SAMPLE ACCEPTANCE CRITERIA

Samples are accepted for testing if they are:
Of appropriate sample type for the tests required
Of sufficient volume for testing
If the information on the request form and sample are correctly matched
If there is sufficient patient/ source information (as detailed in section 6.0 and 10.0)

Samples may be rejected in the following circumstances:
They are of an inappropriate sample type
They have leaked in transit
They are very low volume
They are grossly haemolysed (refer to specific test information)
The sample and request form are mismatched, or the information is not correct
There is significant delay in receipt of sample from date/ time of collection resulting in sample instability
There is insufficient information on the sample and/ or the request form.

On occasion, rejected samples may be tested. In these instances, results reported will bear an appropriate caveat indicating the nature of the problem and that the results should be interpreted with caution. If the sample is rejected, and not subject to testing, the referring clinician/ laboratory will be notified of the rejection of the sample and reasons why.

The validity of results requires adherence to pre-analytical sample guidelines as outlined in the Pathology User Handbook, together with correct sample storage and transport conditions.

Haemolysis/ Icterus/ Lipaemia
Each sample received into the Clinical Chemistry laboratory is assessed for serum indices, *i.e*. the level of haemolysis, icterus and lipaemia present in the specimen. Our test manufacturer has predefined a limit for the H, I and L-indices for each of the tests that are measured. Some tests will be more sensitive to haemolysis, icterus or lipaemia than others. Serum indices are not reported rather they are used for internal quality assurance of the specimens being analysed.

In the situation that a sample is grossly icteric (high bilirubin present) such that a test result cannot be accurately produced, the Clinical Chemistry lab will endeavour to dilute the specimen and produce an approximate result. When the I-index in a sample is >342 µmol/L total bilirubin is tested automatically and reported. When the L-index is >200 triglycerides and cholesterol are tested automatically and reported.

12.0 SPECIMEN TRANSPORT

12.1 General Considerations

It is essential that specimens be transported safely and efficiently to the laboratory in order to ensure the safety of staff transporting samples, other staff, patients and members of the public and to ensure that the specimens reach the laboratory in proper conditions and in a timely manner. All specimens should be dispatched to the laboratory as soon as possible. Samples which are not sent to the laboratory immediately must be stored appropriately to ensure suitability on receipt.

Urgent samples should be sent in the POD or brought to the appropriate laboratory (see section 12.3 for samples which must not be transported in the POD). Urgent Maxim OCS samples must be sent to the laboratory in the specific red urgent specimen bag.

Some samples also require special handling i.e. protection from light, immediate freezing, transport within a temperature interval, within a time frame appropriate to the nature of the examination etc. If in doubt regarding the specimen container required, storage conditions or the special requirements when taking please refer to the test specific section of this handbook or contact the laboratory for advice.

Specimens should always be placed in the transport bag attached to the request form (if they fit) and the bag should be sealed. Multiple specimens should be transported in rigid transport containers and should not be carried by hand or in plastic bags.

Specimen Storage
Ideally all samples should be received in the laboratory as soon as possible. If non urgent specimens are taken out of hours they can be placed in the cold room in the laboratory. Please ensure that these samples are date and time stamped to record their receipt before they are placed in the cold room. It is important to note that some specimens require centrifugation prior to storage, so if in doubt of the appropriate storage conditions consult scientific staff in the laboratory before placing specimen in the cold room. For information on storage of Histology specimens out of hours refer to section 12.5.

12.2 Specimens from Within the Hospital

Pathology Porters collect specimens from designated locations on the SVUH wards on Monday – Friday at 8:30, 9:15 and 10:15am and at hourly intervals from the outpatient department.
SVPH porters collect samples from designated locations on SVPH wards and deliver samples to both the Satellite Laboratory and the main SVUH laboratory (Hourly).
Outside these collections times, specimens should be sent via the POD, (if appropriate to the specimen type) or delivered by hand to the laboratory.
SMH porter collects samples at designated times from the wards: 09.30am, 11.00am, 3.00pm and from theatres at 4.30pm.
Histology samples from SVUH theatres are sent to the histology laboratory via the dumb waiter system (located in theatre and the histology cut up room).

12.3 Pneumatic Tube System SVUH/SVPH (POD)

Instructions for use of the POD
Place the specimen in the carrier and close the carrier lid.
Use the keypad to enter the destination station code.
Place the carrier into the sending funnel.
The green indicator light will be displayed on the panel. The carrier will be automatically transferred when the system is ready.

SVUH POD addresses of each department

SVUH Department	POD Number
Specimen Reception	7776
Clinical Chemistry (On Call)	4550
Haematology/Blood Transfusion (On Call)	7265
Clinical Chemistry	4550
Blood Transfusion	4449
Haematology	7243
Special Chemistry	7205
Immunology	7788
Microbiology	7109
Histology (Only for sealed & fixed samples from Endoscopy)	7169

SVPH POD Addresses
SVPH PODs are blue and are equipped with identification chips. When SVPH PODs are sent from the SVUH and SVPH pathology reception areas (only), they are sent automatically via the default “Scanner Mode” to their primary / home location.

SVPH PODs sent from SVPH ward stations must have their destination entered manually.

SVPH Department	POD Number
SVPH Satellite Laboratory	8340/8341

The following specimen types must **NOT** be sent in the POD

- Histology and Cytology specimens, except from Endoscopy by arrangement
- CSF specimens
- Frozen Sections or any Fresh Histology Specimens
- Respiratory specimens for patients suspected or known to have T.B / SARS or other category pathogens
- Glass Primary Containers
- Specimens for detection of cryoglobulins or cold agglutinins
- If is preferable to avoid using the POD system for arterial blood gas specimens.

12.4 Packaging of diagnostic specimens from GP surgeries, External Hospitals and Clinics

Statutory legislation exists that requires diagnostic specimens to be carried in packages that meet a United Nations test criteria called Packaging Instruction 650 (P650). This standard is to safeguard the drivers of vehicles carrying diagnostic specimens on the road between sites and provides protection to passenger's and/ or the emergency services in the event the vehicle is involved in a road traffic accident.

To meet the requirements of P650, there are 3 levels of packaging for diagnostic liquid and solid samples.
a primary receptacle
a secondary packaging
an outer packaging

The primary receptacle is the specimen container which shall be packed in secondary packaging in such a way that, under normal conditions of carriage, they cannot break, be punctured or leak their contents into the secondary packaging. Secondary packaging shall be secured in outer packaging with suitable cushioning material. Any leakage of the contents shall not compromise the integrity of the cushioning material or the outer packaging.

The outer packaging must be marked with UN 3373 and Biological substances, Category B marked adjacent to the diamond shaped mark. The mark must be clearly visible and legible, the width of the line shall be at least 2mm; the letters and numbers shall be at least 6mm high.

BIOLOGICAL SUBSTANCE, CATEGORY B.
Please note that jiffy bags do not meet the criterion in relation to the outer packaging.
Any queries regarding the above should be directed to the Laboratory Manager.

GP Microbiology specimens for processing by Enfer Medical should be packaged separately to other specimens for SVUH in blue Enfer Medical transport bags.

12.5 Transport and Storage of Histology Samples

Samples may be taken in Theatre, endoscopy etc. and placed in appropriate sized containers or buckets containing fixative (usually formaldehyde) (refer to section 7.2).
Histology and cytology containers should be kept upright during transportation to the Histopathology laboratory.
Histology samples from SVUH theatres are sent to the histology laboratory via the dumb waiter system (located in theatre and the histology cut up room).
Samples for frozen section diagnosis (see also section 24.1) must be brought to the histology lab immediately, by hand or by the dumb waiter system. The histology lab (ext. 4350/4613) must be notified ahead of time that such a sample is arriving.
Histology samples must **NOT** be left in the cold room. If Histology samples are taken out of hours they should be brought directly to the Histology department and left on the bench inside the Histology specimen reception window (Room N3/168). Cytology specimens taken out of hours must be left in the fridge in the Cytology Prep Room (N3-177).

12.6 Transport of Sentinel nodes protocol

Lymph node or tumour from technetium-99m treated cancer patients. These specimens have a very small amount of low-level radioactivity (radioactive half-life: 6 hours). The following precautions are advised for 24 hours after specimen is taken:
Wear gloves to prevent contact with skin.
Specimens should be labelled in theatre with a radioactive hazard label. Place radioactive labels on the container and lid
When not being worked on, store the specimen in the lead-lined box for 24 hours after removal from the patient.

12.7 Quality of Blood Transfusion Samples

Samples must be sent to the laboratory immediately. Samples must be transported between 4°C and 25°C. Whole Blood Samples transported at room temperature arriving later than 48 hours after the time taken are not suitable for processing and will be rejected and the requesting doctor will be informed. (BCSH 2012 Guidelines).

External hospitals sending samples to the laboratory must ensure patient confidentiality is protected during transportation.

All samples are inspected on arrival into the laboratory. Samples which are grossly haemolysed, lipaemic or showing other signs of deterioration, may not be suitable for processing and will be rejected. The requesting sample taker will be informed of this decision and the reason why. For further information on sample taking, identification or transportation please contact the hospital blood bank directly or refer to PPG-ORG-206.

12.8 Labelling and Transport of CSF Samples

CSFs are collected into sequentially numbered specimen containers, with the relevant patient details. **ALL** CSF samples must be transported by hand ASAP to the microbiology laboratory during routine hours and to the Haematology/on-call laboratory out of hours and handed to a scientist. CSF must never be sent via the pod system. Samples must be analysed within 2 hours – the **date and time** of specimen collection must be provided. CSF samples for other examinations will be forwarded on by the microbiology/Haematology staff.
For in-patients OGGT polycal is ordered from pharmacy on the day prior to the test.

13.0 TEST TURNAROUND TIME

Turnaround time (TAT) is given as the maximum number of working hours/days between sample receipt and issuing a report under normal operating conditions. Most tests are performed on the same day but some are batched and performed less frequently. The turnaround time for individual tests is given in the Test Information section of this Handbook. Overall turnaround time for inhouse immunoassays in Clinical Chemistry is one working day.

Results of routine Haematology and Clinical Chemistry tests on GP samples will be available within 3 *working* days of sample arriving in the laboratory.

TAT are routinely monitored as part of the laboratories quality improvement program, and requesters will be notified of delays in turnaround time which could compromise patient care.

In addition to the routine service each department operates an “urgent” system whereby the target turnaround time is shorter. The target turnaround time for urgent chemistry (non immunoassay) tests and Troponin is 90 minutes, and urgent FBC and coagulation screen is also 1.5 hours. If tests are required urgently, please tick the urgent box on the request form. If results are extremely urgent please contact the department to discuss your requirements. Overuse of the urgent service will adversely affect the turnaround time for all urgent tests. Many specialised tests are performed on a weekly basis; if such tests are required urgently please phone the appropriate laboratory to discuss the request.

If GP specimens are urgent please indicate this on the request form and provide phone numbers for phoning urgent results outside normal surgery hours.

For Malaria screens from GP / primary care, please contact the Haematology laboratory in advance.

13.1 Sample Stability/ Receipt of samples

All samples should be received into the Laboratory on the same day that they were taken. Failure to do this may render the sample unsuitable for analysis (for example potassium, FBC). In some circumstances, there is a requirement for the sample to be received within a shorter timeframe, and additional collection criteria may apply (such as transporting on ice). Storage of samples in the fridge will also render some tests unsuitable (for example Coagulation samples). Please ensure all samples are sent to the lab on the day of collection.

Refer to Test Requirements Appendix 1 for information about specific tests. In cases where delay in receipt of a sample means that the sample is unsuitable for analysis, the requesting clinician will be contacted, the reason for rejection will be given, and a repeat sample may be requested.

The validity of results requires adherence to pre-analytical sample guidelines as outlined in the Pathology User Handbook, together with correct sample storage and transport conditions.

13.2 Storage of Examined Samples

Following examination, samples are stored at optimum temperature for specified times. These times conform with the Department policy outlined in the Control of Clinical Material procedure, MP-GEN-CLINMCON.

13.3 Requesting Additional Examinations

Users may request additional examinations on specimens already sent to the laboratory. Additional requests may be made verbally over the phone. The analysis will be performed provided the specimen has been stored appropriately and there is sufficient specimen remaining to perform the additional tests. The time limit for the addition of tests for each department is given below.

In Clinical Chemistry, requests for add-ons must be made on a new request form. Please complete a new request form for the test to be added and POD to the Clinical Chemistry Department.

In SVPH Satellite Laboratory, requests for add-ons must be made on a new request form. Please complete a new request form for the test to be added and POD to SVPH Satellite Laboratory.

13.4 Time Limit for Requesting Additional Examinations

Clinical Chemistry (SVUH, SVPH, SMH): Within 3 days (test dependent).
Blood Transfusion: Within 72 hrs after commencement of transfusion.
Haematology (SVUH, SMH & SVPH): Within 4-24 hours depending on assay- contact the laboratory for details
Immunology: Test / Specimen dependent - varies from 48 hrs to 1 month.
Microbiology: Test/Specimen Dependent – varies from same day to one month.

Please contact the appropriate laboratory for more detail on the time limit for requesting additional examinations

13.5 Repeat Examinations

Repeat examinations are undertaken following analytical failure. These shall be on the primary sample where sample time limitations allow. Otherwise repeat samples shall be requested. Details are outlined in individual laboratory test procedures.

14.0 EMERGENCY OUT OF HOURS SERVICE

An on-call system operates outside normal working hours for emergency work i.e. non-deferrable tests necessary for decisions regarding patient management.
Specimens taken 'Out of Hours' for non-urgent analysis, can be brought to the laboratory where the scientist on-call will give advice on appropriate storage conditions.

14.1 Clinical Chemistry

The following Clinical Chemistry tests are available out of hours:
Arterial blood gases (and acid-base); Co-Oximetry (including COHb, MetHb); Lactate;
Urea, Creatinine & Electrolytes,
Glucose, Calcium, Amylase
Phosphate (Inorganic PO_4), Magnesium Urate
Liver Function Tests, CRP
Ammonia
CK, Troponin T (hs)
Beta HCG
Iron Studies
Lipid Profile (Cholesterol, Triglyceride, HDL)
Lithium, Phenytoin, Theophylline, Carbamazepine, Valproic Acid, Digoxin
Ethanol, Paracetamol, Salicylate
CSF Glucose & Protein
Pleural Fluid pH, Protein & LDH
Fluid Glucose & Fluid LDH
Urinary Sodium, Potassium & Creatinine.
Antibiotics: Vancomycin, Gentamicin, Amikacin available Saturday/Sunday / Bank Holidays - 09:30-12:30

14.2 Haematology

The following Haematology tests are available out of hours:
FBC (White Cell differential available on request)
PT, INR, APTT
D-Dimers
Fibrinogen

Malaria Screens (ICT only if Negative, followed by blood film confirmation the next working day)
Any special tests required urgently will need to be sanctioned by the Consultant Haematologist (e.g. Heparin Assays, Protein C Assays etc.).

14.3 Blood Transfusion

It is hospital policy to avoid routine transfusions out of hours. The out of hour's transfusion service provided only applies to emergencies and to situations where the patients cannot wait until the next routine period. Requests for blood for elective surgical procedures are not processed out of hours.

14.4 Microbiology

The Haematology / Blood Transfusion Scientist On-Call provides a service for urgent CSF and Ascitic Fluid samples. Most other microbiological specimens need not be examined urgently. Please contact the Consultant Microbiologist for advice if in doubt.

14.5 Histology

Urgent liver biopsies can be arranged by contacting the Consultant Pathologist through the hospital switch board.

14.6 Immunology

The Department of Immunology provides an urgent out-of-hours service for ANCA and Anti-GBM tests. The consultant in charge must contact the Consultant Immunologist or the Chief Medical Scientist in Immunology to arrange this service. A name and a mobile phone contact number must be provided for the communication of results.

15.0 CONTACT DETAILS OF ON-CALL PERSONNEL

If specimens are sent to the laboratory using the pneumatic tube or if a scientist is not in the laboratory when specimens are delivered it is essential that they be contacted to inform them that an urgent specimen has been delivered. The contact details for On-Call Scientists are below:

Contact	
Clinical Chemistry Scientist On-Call	Bleep 159 Ext. 4654 / 3828 (Laboratory), Ext 3124 (Senior Room) Ext. 4371(Med Res).
Haematology /Blood Transfusion/ Microbiologist Scientist On-Call	Bleep 465 Ext. 4785 / 4449 (Laboratory) Ext. 4249 (Med Res)

16.0 REPORTING OF RESULTS, CLINICAL ADVICE AND INTERPRETATION

16.1 General Information

Results are available for viewing on the laboratory information system (LIS) following authorisation. Access to LIS is available to all wards in St. Vincent's Public Hospital, St Vincent's Private Hospital and St Michael's Hospital and many of the external hospitals.

Results from requests made via Maxim OCS are available for viewing through Maxim. Local instructions for use of OCS are available in clinical locations where OCS is used and training can be provided by contacting the ward training officer where available and / or the Pathology OCS Lead on cmooney@svhg.ie

Printed reports are issued and delivered to the wards three times daily Mon – Fri at 12:15, 14:30 and 17:30, and Saturdays & Sundays: 13:00. Reports to GP's and External Hospital are sent from Pathology Reception daily Mon- Fri.

In addition to the hard copy reports results are issued electronically to GP's via Healthlink. This HSE funded system is available free of charge to all GP's. Through Healthlink results are available electronically within two hours of authorisation. If access is required please contact Ciaran Mooney Ext. 3299.

Results of Microbiology GP specimens are issued by Enfer Medical via Healthlink and clinical advice and interpretation of these should be sought from them.

Results are reported with reference/therapeutic ranges. A guide to interpretation and clinical advice is given on the report if appropriate. Results that have been requested to be phoned and abnormal results are phoned to the appropriate location subject to defined criteria within each laboratory.

Clinical Advice and Interpretation is available and can be obtained by contacting the appropriate laboratory. A useful online reference is available for laboratory tests is: http://labtestsonline.org. No login username or password is required.

Clinical or Scientific staff should be consulted where uncertainty exists about the availability, appropriateness, or selection of tests, the nature of the specimen required, acceptance criteria of the test, repeat testing frequency or the interpretation of results. Refer to section 5.0 Contact Details for Key Laboratory Personnel.

Paediatric Requests
It is advised that all paediatric requests are sent to a hospital with a paediatric laboratory service to ensure that the sample is handled appropriately, there is continuity in the medical record, paediatric appropriate escalation and interpretation. Please bear in mind that non-pregnant adult reference intervals may be inappropriate in children. Where there is doubt, please do liaise with the paediatric team re the interpretation of such results as well as the laboratory.

Obstetric Requests
It is advised that all obstetric requests are sent to a hospital with an obstetric laboratory service to ensure that there is continuity in the medical record, obstetric appropriate escalation and interpretation.

Transgender Patient Requests
Clinicians should be aware of the potential impact of gender-affirming therapy on laboratory tests and that 'sex' is used to assign biological sex reference ranges.

16.2 Blood Bank

Where blood is required urgently or for transfusion the patient's ward will be contacted by phone as soon as the blood/blood products are ready for issue. Where blood is required for surgery the following day wards will only be contacted if there is a difficulty in supplying the blood.

16.3 Clinical Chemistry

Within the Department of Clinical Chemistry there is a process for escalation of clinical chemistry concerns and/or queries. User issues must be dealt with promptly and appropriately and should not be left unresolved. A specific Duty Scientist role exists in Clinical Chemistry (Monday through Friday, 9 am to 5 pm). The Duty Scientist deals with Clinical Chemistry related clinical concerns or queries only and can be contacted at 221 3127 (dutyscientistclinchem@svuh.ie). If such queries are received via Specimen Reception or the Laboratory, staff there can redirect these calls/letters/emails to the Duty Scientist. The Duty Scientist is positioned to deal with the service user issues/needs and if required can escalate, as appropriate, to the Laboratory Director/ Consultant Chemical Pathologist.

Reference intervals for tests reported by the Clinical Chemistry laboratory are extracted from manufacturer's instructions for use, clinical practice guidelines or formulated in co-operation with medical specialties using specific tests in clinical practice. For drugs a suggested therapeutic range is reported that is derived from the relationships between the measured serum level, clinical control and the emergence of side effects.

Please note for Clinical Chemistry tests, due to a limitation in our laboratory information system a lower limit for reference intervals must always be inputted for tests with associated reference intervals. Where a reference interval is stipulated as a less than value (e.g. <34 nmol/L) the lower limit will be designated as zero in our IT system (e.g. 0 – 34 nmol/L). While this is scientifically incorrect it is a pragmatic work around which simplifies reference interval expression for you the user.

As is common practice, the Clinical Chemistry laboratory reports non-pregnant adult reference intervals in general based on the data supplied on the request form to determine which interval to apply for the test in question. These may be inappropriate in pregnancy and can vary depending on the time since conception depending on the analyte and analytical method used by the laboratory. Partitioning into trimesters may also be arbitrary for some analytes. There are some general changes which occur in pregnancy too such as 1. hormone changes which may cause an increase in binding protein concentration and thus in analyte concentrations that bind to these proteins and 2. plasma volume increasing by 10 – 15% at 6 – 12 weeks of gestation with a smaller red cell mass increase resulting in a dilutional effect on many Clinical Chemistry analytes. When our supplier has provided pregnancy related reference intervals, we will provide these in the relevant section of our user handbook. Where there is doubt, please do liaise with the obstetric team overseeing the patient re the interpretation of such results as well as the laboratory.

Haemolysis/ Icterus/ Lipaemia

Each sample received into the Clinical Chemistry laboratory is assessed for serum indices, i.e. the level of haemolysis, icterus and lipaemia present in the specimen. Our test manufacturer has predefined a limit for the H, I and L-indices for each of the tests that are measured. Some tests will be more sensitive to haemolysis, icterus or lipaemia than others. Serum indices are not reported rather they are used for internal quality assurance of the specimens being analysed.

In the situation that a sample is grossly icteric (high bilirubin present) such that a test result cannot be accurately produced, the Clinical Chemistry lab will endeavour to dilute the specimen and produce an approximate result. When the I-index in a sample is >342 µmol/L total bilirubin is tested automatically and reported. When the L-index is >200 triglycerides and cholesterol are tested automatically and reported.

Any issues you encounter with these interferences, or others you may suspect, can be escalated to the Clinical Chemistry Departments Duty Scientist (on 221 3127 during the routine day) or Consultant on call (through switch) for discussion.

Interpretation of fluid clinical chemistry results
Clinical Chemistry receives fluids of various origin in patients with different pathologies. Below is general advice as regards what tests to request and how to potentially interpret the results.

Query chyle / chylothorax:
Chylous infusion or chylothorax results from chyle or lymph accumulation in the pleural space due to leakage from the thoracic duct / other lymphatic vessel because of an obstruction (*e.g.* malignancy) or disruption (*e.g.* trauma).
If after centrifugation the sample remains turbid it is most likely that chyle (or pseudochyle) is present. To confirm lymph fluid is present pleural fluid triglycerides and cholesterol should be measured. Chyle is made up of chylomicrons with high pleural fluid triglyceride concentrations observed. Chylous effusions need to be distinguished from pseudochylous effusions; different causes and treatments. Pseudochyle accumulates in chronic pleural inflammation and is rich in cholesterol.
Pleural fluid triglyceride ≥1.2 mmol/L with a pleural fluid cholesterol <5.2 mmol/L can be indicative of chyle.
Pleural fluid triglycerides <1.2 mmol/L with a pleural fluid cholesterol >5.2 mmol/L can be indicative of pseudochyle.
(Kopcinovic *et al.* Biochem Med (Zagreb) 2020; 30(1): 010502)

Query urinothorax:
Accumulation of urine in the pleural space (or other) is rare but can occur due to an obstruction or trauma. Creatinine will be markedly elevated in the fluid sample. Pleural fluid creatinine: serum creatinine ratio >1 is indicative of an urinothorax (Kopcinovic *et al.* Biochem Med (Zagreb) 2020; 30(1): 010502).

Query CSF leak:
Beta–trace protein/asialotransferrin/β-2-transferrin is the preferred test for otorrhoea (fluid discharge from the ear) or rhinorrhoea (fluid discharge from nose) where the query is whether the fluid discharge is representative of a CSF leak. This protein is only present in CSF. Dispatched from Microbiology Specimen Reception.

Distinction of exudative (localised disorders) and transudative (systemic disease) effusions in pleural and pericardial fluid
Light's criteria to be applied to differentiate transudative and exudative effusions. **Laboratory results should always be interpreted alongside the clinical scenario.**
Light's criteria require measurement of fluid total protein and LDH with simultaneous measurement of serum total protein and LDH in a paired sample. An exudative effusion will meet at least one of the following criteria:

1. Fluid protein: Serum protein ratio >0.5 and/or
2. Fluid LDH: Serum LDH ratio > 0.6 and/or
3. Absolute fluid LDH activity >2/3 of the serum upper reference limit for LDH (250 U/L)

Where results are inconclusive with Light's criteria the fluid: serum cholesterol ratio can be used. Exudates will have a ratio >0.3.
For **pleural fluids** where results are inconclusive with Light's criteria the serum - pleural fluid albumin gradient can also be used. Pleural transudates will have an albumin gradient >12 g/L and exudates a fluid albumin gradient ≤12 g/L.
(Kopcinovic *et al.* Biochem Med (Zagreb) 2020; 30(1): 010502)

Peritoneal (ascitic) fluid
The serum - ascites albumin gradient (SAAG) can be used to distinguish peritoneal effusions caused by portal hypertension from those caused by other pathophysiological mechanisms.
High albumin gradient effusions (transudates) will have a SAAG ≥11 g/L (*e.g.* cirrhosis, heart failure, alcoholic hepatitis, liver metastases, portal vein thrombosis). Low albumin gradient effusions (exudates) will have a SAAG <11 g/L (*e.g.* malignancy, biliary disease, pancreatic disease, TB, peritonitis, nephrotic syndrome, bowel obstruction).
(Kopcinovic *et al.* Biochem Med (Zagreb) 2020; 30(1): 010502)

16.4 Haematology

Haematology pregnancy related reference ranges
St Vincent University Hospital is not a Maternity site thus pregnancy ranges are not available in Apex.
However they can be reviewed below if required:

Haematology Pregnancy Related Reference ranges

Test	Units	1st Trimester	2nd Trimester	3rd Trimester
Haematology Tests				
WBC	($x10^9$/L)	5.7 to 13.6	5.6 to 14.8	5.9 to 16.9
Haemoglobin	(g/dL)	11.0 to 13.9	10.6 to 14.8	9.5 to 15.0
Platelets	($x10^9$/L)	174 to 391	155 to 409	146 to 429
RBC	($x10^{12}$/L)	3.42 to 4.55	2.81 to 4.49	2.71 to 4.43
HCT	l/l	33.0 to 41.0	32.0 to 39.0	30.0 to 40.0
MCH	Pg	30 to 32	30 to 33	29 to 32
MCV	Fl	81 to 96	82 to 97	81 to 99
RDW	%	12.5 to 14.1	13.4 to 13.6	12.7 to 15.3
Neutrophils	($x10^9$/L)	3.6 to 10.1	3.8 to 12.3	3.9 to 13.1
Lymphocytes	($x10^9$/L)	1.1 to 3.6	0.9 to 3.9	1.0 to 3.6
Monocytes	($x10^9$/L)	0.1 to 1.1	0.1 to 1.1	0.1 to 1.4
Eosinophils	($x10^9$/L)	0.0 to 0.6	0.0 to 0.6	0.0 to 0.6
Basophils	($x10^9$/L)	0.0 to 0.1	0.0 to 0.1	0.0 to 0.1
Coagulation Tests				
PT	Seconds	9.7 to 13.5	9.5 to 13.4	9.6 to 12.9
INR	Ratio	0.86 to 1.08	0.83 to 1.02	0.80 to 1.09
APTT	Seconds	23.0 to 38.9	22.9 to 38.1	22.6 to 35.0
D-dimer	ug/FEU/ml	0.05 to 0.95	0.32 to 1.29	0.13 to 1.70
Fibrinogen	(g/L)	2.44 to 5.10	2.91 to 5.38	3.01 to 6.96
Factor Assays				
Factor V	%	75 to 95	72 to 96	60 to 88
Factor VII	%	100 to 146	95 to 153	149 to 211
Factor VIII	%	90 to 210	97 to 312	143 to 353
Factor IX	%	103 to 172	154 to 217	164 to 235
Factor XI	%	80 to 127	82 to 144	65 to 123
Factor XII	%	78 to 124	90 to 151	129 to 194
Other				
Antithrombin	%	89 to 114	78 to 126	82 to 116
Protein C	%	78 to 121	83 to 133	67 to 135
Protein S (free)	%	34 to 133	19 to 113	20 to 65

Source:
Maternal adaptations to pregnancy: Hematologic changes
Author: Kenneth A Bauer, MDSection Editors: Charles J Lockwood, MD, MHCMLawrence LK Leung, MDDeputy Editors: Vanessa A Barss, MD, FACOGJennifer S Tirnauer, MD
https://www.uptodate.com/contents/maternal-adaptations-to-pregnancy-hematologic-changes?search=haematological%20-changes%20-in-pregnancy%20.Oct%202012&source=search_result&selectedTitle=1~150&usage_type=default&display_rank=1

16.5 SVPH Satellite Laboratory

The SVPH laboratory operates as a satellite of Head Office Clinical Chemistry and Haematology laboratories. Reporting of results, clinical advice and interpretation is therefore standardised as much as possible between these laboratories. In addition to the

results and reference intervals, some reports also have clinical advice & interpretation included. Should additional clinical advice and supportive interpretation be required, the Consultant Head of Department for the appropriate section (Consultant Chemical Pathologist or Consultant Haematologist) can be contacted. Contact information is available in section 5.2 *Key Laboratory Personnel*.

17.0 INSTRUCTIONS FOR WARD ENQUIRY FOR VIEWING LABORATORY RESULTS

17.1 Ward Enquiry (LIS)

The Laboratory Information System (LIS) allows ward enquiry for results to individuals with username and password. To view patient results enter the patient's hospital number and the first two characters of the surname. The patient's demographics will appear on the screen. Check that the patient demographics are correct.

At the bottom of the screen there is a field to select the discipline. Discipline specific results can be viewed the appropriate letter for the discipline:

B – Clinical Chemistry, **M** - Microbiology, **P** – Histology/Cytology **I** - Immunology

T- Blood Transfusion* **H** - Haematology **P** – Histopathology

*See CI-BTR-WARDENQUIRY for instructions on enquiry for Blood Transfusion

Leave blank (use space bar to remove) to see results from all disciplines.
The selected patient's results are displayed on Results Screen with the most recent specimens first.
The main body displays each:
TEST NAME– RESULT – and REFERENCE RANGE (where applicable).
Comments are also displayed underneath results.
If the results are not yet complete or ready for release they are shown as "In Progress"
Results falling outside Reference Ranges are highlighted. "Flashing" results indicate that the result has changed significantly from the previously reported value.
If a specimen is part of a dynamic function test a comment to that effect will display- use option "F" to view full results.
If the report extends beyond the bottom of the screen a message "Cursor down for more" appears in a highlighted bar at the bottom of the screen (use down arrow key to view next page of results). This can occur with any specimen. **It is essential to arrow down and view all results and comments.** Important information and comments may be missed if the entire report is not read. If you print the result you must print both pages.
To move between specimens on this patient use "Page Up" or "Prev" and "Page Down" or "Next" keys.

For queries relating to LIS log in, please contact the Laboratory ICT Manager.

17.2 Maxim OCS Results Review

Patient results in Maxim can be reviewed when putting the patient in context, and reviewing data under any of the following forms:

- Pathology Orders And Results
- New Results
- Frim the ED Tracker using the Right Click

Details are outside the scope of this document. Local instructions for use of OCS are available in clinical locations where OCS is used and training can be provided by contacting the ward training officer where available and / or the Pathology OCS Lead on cmooney@svhg.ie

Access to Maxim is restricted and a request must be sent to either Hospital ICT or Pathology OCS Lead.

18.0 CRITERIA FOR PHONING RESULTS

Critical results; significantly abnormal results based on criteria defined below; significant unexpected results /findings; notice that there will be a significant delay in a turnaround time for a test that could affect patient care are all communicated to clinical teams by telephone.

Urgent, critical, alert or unexpected significantly abnormal results are categorised into three categories depending on the urgency of the finding and the need to communicate the results quickly.

Category **A** results	Require communication within 2 hours. This classification indicates potential immediate danger to the patient, or a potentially life-threatening illness when urgent intervention is required
Category **B** results	Require communication within 24 hours, and preferably on the same working day
Category **C** results	Could have an immediate impact on a patient's management (either treatment or investigation), however action is likely to be taken on the next working day. Telephone communication of these results on the next working day was deemed satisfactory

Critical results are communicated by phone. The process for communication of critical results is to first contact the clinician who requested the testing (GP or in-house clinician) with the results. The laboratory and will indicate the urgency of the results. In the event of failure to contact the requesting clinician, appropriate contingencies will be implemented to ensure that the result is communicated as far as possible. This may include contacting GP mobile phone numbers, patient Consultant or alternative clinical personnel. It is the responsibility of the clinician to ensure that there are adequate contact details available to the laboratory for them to facilitate this communication. It is also the responsibility of the clinician to ensure that on receipt of a critical result, the information is acted upon in a timely manner as appropriate.

18.1 Criteria for phoning Haematology results SVUH, SVPH, SMH

The following abnormal results should be phoned to GPs:

GP Patients					
Analyte	Unit	Low	High	Category	Comment
Haemoglobin	g/dl	</= 4 /= 9	 >/=19 >/=21	A B B	Phone to Haem team and GP if first presentation. Unless previously abnormal **or** a fall of >/= 3.0 g/dl if within normal range or a fall of >/= 2.0 g/dl if less than 10g/dl. Phone to Haem team and GP if first presentation.
WBC Count	X10 9/l		>=30	B	Unless previously high Morphology follow up
Neutrophil count	X10 9/l	</=0.5 </=1.0		A B	Unless previously low
Lymphocytes	X10 9/l		>/=50	B	Unless previously high Morphology follow up
Platelet count	X10 9/l	</=30 </=80		A B	Phone to Haem Team and GP if first presentation Unless previously low
			>=600	B	Unless previously high
Blood Film				A	?Acute leukaemia*. ?TTP/HUS Phone Haem Team *also phoned by the Haem Team to the Clinician treating patient
INR	Secs		>/=5.0 >=4.0	A B	Unless previously high
APTT	Secs		>/=150	B	Unless previously high
Fibrinogen	g/l	</=1.0		A	Unless previously low
Anti Xa	IU/L	>/=1.0		A	
Factor Assays				B	On request or if abnormally low
Sickle Cell Screen			Positive	B	
Malaria screen			Positive	A	Phone to Microbiology team and report to Surveillance scientist
Immuno-phenotyping	Acute leukaemia results are phoned immediately to the Haem team who will contact the GP. Other haematological malignancy results are communicated to the Haem Team at sign out. They will follow up with the GP.				
Unsuitable samples/ Significant Abnormal Findings/ Amended reports				B	

The following should be phoned to Wards:

Wards					
Analyte	Unit	Low	High	Category	Comment
Haemoglobin	g/dl	</= 4 /= 7	 >/=19 >/=21	A B B	Phone to Haem team and Clinician if first presentation. Unless previously abnormal **or** a fall of >/= 3.0 g/dl if within normal range or a fall of >/= 2.0 g/dl if less than 10 g/dl. Phone to Haem team and Clinician if first presentation
Neutrophil count	X10 9/l	</=0.5 </=1.0		A B	Unless previously low except Oncology/Haem patient
Lymphocytes	X10 9/l		>/=50	B	Unless previously high Morphology follow up
Platelet count	X10 9/l	</=30* </=80		A B	Phone to Haem Team and Clinician if first presentation Unless previously low
Blood film				A	?Acute leukaemia* ?TTP/HUS Phone Haem Team *also phoned by the HaemTeam to the clinician treating patient.
INR	Secs		>/=5.0 >/=4.0 >/=8.0	A B A	Unless previously high Unless previously high Phone to AMS if patient is attending OPDW
APTT	Secs		>/=150	A	Unless previously high
Fibrinogen	g/l	<1.0		A	Unless previously low
Anti-Xa	IU/l		>/= 1.0	A	
Factor Assays				B	On request or if abnormally low
Sickle Cell Screen			Positive	B	
Malaria Screen			Positive	A	Phone to Microbiology team and report to Surveillance scientist
HITS Screen				A	If phoned from referral lab, phone Haematology team
Plasma Viscosity				A	If phoned from referral lab, phone Haematology team
CD34				B	Phone to leucapheresis nurse
Post thaw Stem Cell Viability				B	Phone to Tissue Establishment
Immuno-phenotyping	Acute leukaemia results are phoned immediately to the Haem team. All other haematological malignancy results are communicated to the Haem team upon a weekly sign out meeting in accordance with the Haem Pathology weekly MDT. Non MDT haematological malignancy results are communicated to the Haem Team at who will follow up with the relevant Clinician and/or GP.				
Liver Transplant/Urgent theatre samples				A	
Unsuitable samples/Significant Abnormal Findings/Amended reports				B	

For SMH only, in addition to the above, the following are to be brought to the Consultant Haematologist's attention, where there are no previous abnormal results:

1. White cell counts <1.0 x 10^9/l or >30 x 10^9/l
2. Absolute Neutrophil Count <0.75 x 10^9/l
3. Haemoglobin <6.0 g/dl
4. Platelet count <50 x 10^{12}/l

18.2 Criteria for phoning Clinical Chemistry Results

Analyte	Unit	Low	High	Category	Comment
Sodium	mmol/L	<=120	>=155	A	<=130 if <16y If new for this episode.
Potassium	mmol/L	<=2.5	>=6	A	If new, notes on haemolysis.
eGFR	mL/min/ 1.73m^2	<=15	-	A	If new.
Urea	mmol/L	-	>=30	A	>=10 if <16y If new, or increased significantly e.g. 100% (exc. Pre-post dialysis).
Creatinine	umol/L	-	>=354	A	>=200 if <16y If new, or increased significantly e.g. 100% (exc. Pre-post dialysis)
ALT	U/L	-	>=750 (ULNx15)	B	If new.
AST	U/L	-	>= 600 (ULNx15)	B	If new. Add ALT if not requested.
Amylase	U/L	-	>=500 (ULNx5)	A	If new
Adjusted Ca	mmol/L	<=1.8	>=3.0	A	If new.
Calcium Total	mmol/L	<=1.8	>=3.0	A	If new. Where adjusted Ca not calculated.
Calcium Ionised	mmol/L	<1.0	>1.6	A	If new.
Phosphate (Inorganic PO_4)	mmol/L	<=0.30	-	A	If new.
Magnesium	mmol/L	<=0.4	-	A	If new.
Cortisol	nmol/L	<=50	-	A	If new and if not part of a dexamethasone suppression test.
CRP	mg/L	-	>=300	A	If new
CK	U/L	-	>=5000	A	If new
Glucose	mmol/L	<=2.5	>=25.0	A	>=15 if <16y
Paracetamol/ Salicylate/	-	-	-	A	Phone positive results only
Ethanol	mg/dL	-	>399	A	
Carbamazepine	mg/L	-	>=25	B	If new.
Digoxin	ug/L	-	>=2.5	B	If new.
Lithium	mmol/L	-	>=1.5	B	If new.
Phenytoin	mg/L	-	>=25	B	If new.
Theophylline	mg/L	<2.0	>=25	B	If new.
Valproate	mg/L	-	>100	B	If new, add LFT if elevated.
Troponin T (hs)	ng/L	-	>100	A	If new, Notes on haemolysis.
Triglycerides	mmol/L	-	>=20	B	If new.
Free T4	pmol/L	-	>=50	C	If new.
IgG	g/L	<3.0	-	C	If new, and if both IgA and IgM are low.
Paraprotein	g/L	Any IgD/IgE	IgG>15 IgA>10 IgM>10	C	If new.
Iron	umol/L	-	>60	B	If new, external patient
Uric Acid	umol/L	-	>700	B	If new, external patient
CSF Protein/ Glucose	-	CSFG<=2.0	CSFTP>0.45 CSFG>=5.0	A	Normal results do not require phoning.
Serum Osmolality	mOsm/kg	<230	>350	A	If new.
Blood Gases (all) including CoHB/ MetHb, Lactate				A	Phone all results. If tHb<=7g/dL please request that an FBC is sent to Haematology to confirm result, if not already done.

Ammonia	umol/L	-	>100	A	First time > 100 And any increase >25% from previous.

18.3 Criteria for phoning Immunology Results

The circumstances under which results are telephoned to requesting clinicians include:

Examination	Units	Critical Limits	Urgency	Comment
ANCA	U/mL	C-ANCA (anti-PR3/MPO positive) P-ANCA (anti-MPO/PR3 positive) A-ANCA (anti-MPO/PR3 positive)	B	New positive (first detection)
Anti-GBM antibodies	U/mL	Positive	A	New positive
Anti-LKM antibodies		Positive (< 16 years old)	B	New positive
Hypogammaglobulinaemia	g/L	IgG <3 g/L with low IgA & IgM	C	Reported from Clinical Chemistry
New paraprotein First time	g/L	IgG >15 g/L IgA > 10g/L IgM >10 g/L IgD/IgE any level Bence Jones protein*	C	Reported from Clinical Chemistry Immunology*
Paraneoplastic antibodies		Positive	B	New positive
Anti-NMDA receptor antibodies		Positive	B	New positive
Anti-MOG antibodies Anti-AQ4 antibodies		Positive	B	New positive
Lymphocyte subsets	Cells x 10^6/L	Helper T Cells < 200 x 10^6/L	C	Referral laboratory contacts clinician. Confirmed by Immunology.
Cyclosporin	ng/mL	>1500	B	
Tacrolimus	ng/mL	>30	B	
Where a report has been amended as appropriate				
Where there will be a significant delay in a test turnaround time that could affect patient care.				

In general other Immunology results do not require phoning. However, during the authorisation process some results may be identified for phoning by senior staff. In such circumstances the requesting clinician is contacted by phone.

18.4 Criteria for Phoning Microbiology Results

Test	Result	Category	Comment
Faecal microbiological analysis	VTEC positive	B	VTEC will be phoned Mon-Fri. The test is not performed at weekends.
C. diff	Toxin positive	B	C. diff will be phoned Mon-Fri. The test is not performed at weekends unless specifically requested by consultant microbiologist. The result will be communicated same day as test.
Mycobacterial microbiological analysis	Positive AFB or ZN stain or positive culture/ PC	C	AFB pos/ TB Pos culture will be phoned Mon-Fri.
Surveillance screen – CPE (rectal/ stool)	Positive (first)	C	
Device culture	Positive from a normally sterile site	C	
Swab/ pus/ fluid aspirate	Unexpected result (unusual pathogen. MDRO) where patient likely to be on	C	

	inappropriate empiric therapy		
Joint fluid microscopy and culture care set	Positive gram stain or culture	B	
Legionella urinary ag	Positive	B	Leg Ur Ag will be phoned Mon-Fri. The test is not performed at weekends
Leptospirosis	IgM positive	C	Phoned Mon-Fri - results do not send over weekend from NVRL
Blood Culture	Clinically significant positive result	A/B as per HSE Irish guideline for the investigati on of blood culture samples	Clinical interpretation required.

Virology			
CMV	IgM positive. Low avidity IgG detected	C	Acute primary CMV Phoned Mon-Fri - results do not send over weekend from NVRL
Acute viral hepatitis	IgM positive	C	Phoned Mon-Fri – results do not send over weekend from NVRL
HIV 1 or 2	Positive	C	New detection - Phoned Mon-Fri - results do not send over weekend from NVRL
HSV	HSV DNA detected	C	Eye swab - Phoned Mon-Fri - results do not send over weekend from NVRL
Parovirus B19	IgM Positive	C	Pregnant patient - Phoned Mon-Fri - results do not send over weekend from NVRL
Measles	IgM Positive Oral fluid/ urine RNA positive	C	Phoned Mon-Fri - results do not send over weekend from NVRL
Rubella	IgM positive Oral fluid RNA positive	C	Phoned Mon-Fri - results do not send over weekend from NVRL
Toxoplasma	Positive – primary infection	C	Pregnant patient - Phoned Mon-Fri - results do not send over weekend from NVRL
Treponema Pallidum	Positive specific serology	C	1st detection pregnant patient - Phoned Mon-Fri - results do not send over weekend from NVRL
Varicella Zoster	IgG negative	C	Pregnant or immunocompromised patient, exposed to VZV - Phoned Mon-Fri - results do not send over weekend from NVRL

Urgent reports are telephoned to clinicians on a case-by-case basis depending on the clinical circumstances. CSF cell-count results are phoned where white cell count is >=6. The medical microbiology team will normally telephone the patient's clinical team directly and discuss the case.

A result will also be telephoned if requested by the clinician. In addition, results may be phoned based on case or clinical circumstances. In these cases, the medical microbiology team will telephone the patient's clinical team directly and discuss the case.

18.5 Criteria for Phoning Histopathology Results

Significant Unexpected Results - These are cases where the pathologist has concerns that histopathology findings are clinically significant for the patient and will be unexpected. The decision will require professional judgement on the part of the pathologist and should be made in conjunction with the clinical details on the request form.
Increasingly, histopathology reports are communicated directly to the clinician as part of multi-disciplinary team meetings (MDTs) which facilitate consideration of the Histopathology findings in the context of clinical and other diagnostic finding.

18.6 Criteria for Phoning Blood Transfusion Results

The Electronic Blood Track System (EBTS) is operational in SVUH/SVPH/SMH and SCH. The EBTS allows digital visual access to the fridges from the wards. This allows the wards to see what is available in the fridges for patients.
Results will be phoned in the following circumstances:
When Octaplex is ready

When all emergency requests are ready
When requested by phone by the user
When blood or blood products are available for St. Michael's Hospital or St Columcille's Hospital
When an urgent crossmatch is delayed e.g. due to positive antibody screen.
The call will be made to the most appropriate location/person i.e. doctor, ward, theatre, A/E, etc.
Samples which are rejected will be phoned to the sample taker.

19.0 INFECTION CONTROL

The Infection Team work in conjunction with all Healthcare staff, patients and visitors provide an infection prevention and control service. They provide advice on all aspects on infection prevention and control including the appropriate management and placement of patients with an infection and carry out surveillance of problem organisms and healthcare associated infections within the hospital and communicate results of these to healthcare staff and management. Cases of diarrhoea, suspect TB, meningitis or suspected outbreaks of infection must be reported to the infection control sister and/or the consultant microbiologist.

The Infection Control team develop and participate in programs designed to inform, educate, advice and train staff and patients about infection control issues.

20.0 COAGULATION SERVICE

20.1 Anticoagulation Monitoring Service

The Haematology Department runs an Anti-Coagulation Monitoring Service (AMS) for patients taking oral anticoagulants (mainly warfarin) when they are discharged from hospital. The service is a monitoring service not a clinic. The service monitors patient's INR blood tests, advises on the dose of oral anticoagulant to take and when to return for the next blood test. A doctor does not see the patient at any stage. The patient remains the responsibility of his/her referring doctor or GP, whom the patient is advised to contact if she/he has any problems. The service must receive a completed Anticoagulation Monitoring Service Referral Form from a doctor before a patient is accepted to the Service. This must be delivered to the service prior to the patient attending. In SMH the AMS is confined to patients referred by hospital clinicians. The SMH Anticoagulation Nurse Bleep is 7068.
The SVUH AMS can be contacted on Ext. 4153 or Anticoagulant Nurse Bleep 663.

20.2 Guidelines for Thrombophilia Screening

Thrombophilia screening rarely changes the management of the index patient. Please consider this before testing.

When to test?
Prothrombotic tests are best performed when the patient is not on anticoagulants and fully recovered from the acute thrombotic event. However, patients on Warfarin may be tested when their anticoagulation is stabilised. In general, thrombophilia screening is not urgent. However there are a few instances where screening may change the clinical management of a presenting event. Please discuss with the Haematology team if you have any concerns. Specimens should not be taken out of hours because they require special preanalytical preparation before storage. For Laboratory queries, contact the Coagulation Lab ext 4395

Thrombophilia screens should always include a Full Blood Count, CRP, B12, Serum Folate and Homocysteine.

Thrombophilia testing is not recommended in the following clinical circumstances:

- Unselected patients after a first venous thrombosis event
- Asymptomatic relatives of patients with the Factor V Leiden or Prothrombin gene mutations
- Asymptomatic relatives of patients with venous thrombosis prior to hormonal treatment
- Upper limb thrombosis
- Catheter related thrombosis
- Retinal vein occlusion
- Patients prior to assisted conception or patients with ovarian hyperstimulation
- Hospitalised patients as part of risk assessment for thrombosis
- Arterial thrombosis / C.V.A

Samples should not be sent for laboratory thrombophilia/ Lupus testing if patients are being treated with heparin or low molecular weight heparin or with the new oral anticoagulants (DOACs), except in limited circumstances. Please discuss with the Coagulation Laboratory (01 221 4395) in the event that such a patient requires testing.

Thrombophilia testing may be considered in the following clinical circumstances:

- First venous thrombosis in a patient with a family history of unprovoked or recurrent venous thrombosis in one or more first degree relatives
- Asymptomatic relatives of venous thrombosis patients with a known heritable thrombophilia prior to hormonal treatment.
- Cerebral venous sinus thrombosis
- Splenchnic vein thrombosis – has uncertain predictive value. Check for JAK II mutation first.
- Skin necrosis secondary to Vitamin K antagonists
- Late pregnancy loss after 13 weeks if requested by National Maternity Hospital.

Testing for Antithrombin or Protein C or Protein S is recommended in the following clinical circumstances:

- Asymptomatic relatives with a family history of Antithrombin, Protein C or Protein S deficiency **AND** a family history of thrombosis
- Neonates and children with purpura fulminans (severe Protein C or Protein S deficiency)

Lupus Screen:
Antiphospholipid antibody testing (Lupus anticoagulant, antiphospholipid antibodies, anti-beta 2 glycoprotein 1 antibodies) may be considered in the following clinical circumstances:

- History of recurrent first trimester miscarriage (>/= 3 consecutive miscarriages)
- >/=1 unexplained deaths of a morphologically normal foetus at or beyond10/40
- >/=1 premature birth of a morphologically normal neonate before 34/40 because of eclampsia/severe preeclampsia or placental insufficiency
- Young adults (<50 years) with ischaemic stroke
- Patients with an unprovoked PE or proximal DVT if anticoagulation is discontinued (note that these patients generally warrant long-term anticoagulation and if it has already been decided to continue long-term anticoagulation, then testing is not indicated).

Testing in GP setting:
A brief letter with the clinical details and a query with respect to the appropriateness of testing should be sent to a Consultant Haematologist who will then advise on testing.

Thrombophilia testing for Fertility Clinics:
Samples that do not conform to the SVUH Guidelines will not be processed. If Fertility Clinics wish to process Thrombophilia testing, this should be organised outside the SVUH system.

Clinical advice on Thrombophilia testing:
Clinical advice may be obtained from the Consultant Haematologists or a member of the Haematology team.
Occasionally it may be appropriate to test patients who fall outside the guidelines given above. The clinical condition should be discussed with one of the Consultant Haematologists.

TESTS WILL NOT BE PROCESSED WITHOUT PATIENT AGE AND THE RELEVANT CLINICAL DETAILS.

21.0 IMMUNOLOGY SERVICE

The Department of Immunology performs a large range of tests that aid in the diagnosis of autoimmune diseases and allergy, and certain types of malignancy. The department also provides a regional service for monitoring levels of the immunosuppressant drugs including Cyclosporin and Tacrolimus. Some investigations for possible immunodeficiency will be developed; we welcome input from interested clinicians in this process.

Disease specific test profiles are listed below. Some guidance on allergy testing is outlined (21.2). A range of Immunology tests are sent to a referral laboratory (full details in Test Requirements Appendix 1).

Contact the medical (consultant immunologist) or scientific staff in the department for further information on test selection and test interpretation. The consultant immunologist is available to give clinical advice on individual patients when required.

21.1 Immunology Test Profiles

We have established a range of disease specific test profiles for investigation of immunological disorders. For information on the full test repertoire offered, sample types required, reference ranges and test turnaround times, please see Test Requirements Appendix 1. Where screening tests are positive follow-up tests are performed as appropriate.

Autoimmune liver disease

Anti-nuclear antibody (ANA) - (follow-up tests: anti-ENA and anti-dsDNA)
Anti-smooth muscle antibody
Anti-mitochondrial antibody (follow-up test: anti-pyruvate dehydrogenase (M2))
Anti-LKM antibody (follow-up test: anti-cytochrome P450 (LKM-1))

Vasculitis

ANA
Anti-ENA
Anti-dsDNA
Anti-neutrophil cytoplasmic antibody (ANCA)
Rheumatoid Factor (RF)
C3, C4 (test performed in Clinical Chemistry – use the white/green Blood Sciences request form)

Acute Renal Failure
ANA
ANCA
Anti-GBM
C3, C4 (test performed in Clinical Chemistry – use the white/green Blood Sciences request form)

Inflammatory Arthritis
ANA
RF
Anti-CCP antibody

Coeliac disease
Anti-tTG
Anti-EMA (with positive anti-tTG)

21.2 Allergy testing

It is important to note that a normal level of total IgE does not preclude the presence of allergen-specific IgE, and therefore should not be relied on as a screening test for allergy. Clinical history should guide selection of allergen specific IgE tests.

Food allergy testing involves measurement of specific IgE to a particular food allergen where the patient has a history of specific reactions to food. An allergy focused history should dictate which individual allergens are tested.

As a general principle, we do not perform a battery of allergy tests unless there is very convincing information that it is needed.

Please send at least 5 mL of serum for allergen specific IgE.
Please contact the laboratory for further advice if needed.

21.3 Collection and transport of samples for detection of cryoglobulin/ cryofibrinogen

Blood (3 x serum & 2 x EDTA samples) must be collected and transported at 37°C in a portable incubator (available in the Phlebotomy Department). For outpatient / GP requests, samples should be taken by the phlebotomy service in SVUH.

22.0 MORTUARY SERVICE - Arrangements for the Performance of an Autopsy

Post-mortem Procedure Guidelines for Coroner and Hospital post mortems are available at the Nurses' Station on each ward. These guidelines described the circumstances in which the Coroner must be contacted and also describes the procedure to be followed when the Coroner orders a post mortem. In addition, on each ward there are individual packets containing copies of the guidelines, Coroner's Information Booklets and Information Booklet for Relatives, and consent forms.

22.1 Coroner Post Mortem

In the case of a Coroner's PM, the medical team contacts the Coroner and the Coroner will decide if an autopsy is necessary. If an autopsy is necessary the Coroner will fax the official order from for an autopsy to the mortuary office. The Pathologist may choose to go ahead and perform an autopsy on the basis of having received an order for the autopsy over the telephone. Receipt of such an order is recorded in the telephone diary.

In the case of a Coroner's PM only the official order of the Coroner is necessary to perform the post-mortem. Consent from the next of kin is not required. The family will be advised by the medical team of the requirement for the PM and consulted in relation to the retention of organs and subsequent disposal. A Coroner Bereavement Pack is located at the nurse's station on each ward and is given to each family. The pack contains The Coroner Post Mortem Information Form, which is completed by the doctor and next of kin. The pack also contains booklets about PM examinations, bereavement, and death issues.

22.2 Hospital (Non-Coroner) Post Mortem

For a Hospital PM to proceed, it is the responsibility of the clinical team (Consultant or Registrar) to receive written informed consent from the next-of-kin of the deceased by completing the Hospital Post Mortem Consent Form, MF-MOR-PMHCON. A full or partial examination is discussed with the next of kin, and indicated on the consent form. Details on retention of organs are also indicated on the consent form. The medical team delivers all relevant documentation including clinical details regarding the deceased to the Pathology Department. The Pathologist ensures that all relevant documentation is available before proceeding with the autopsy.

A Hospital Bereavement Pack is located at the nurse's station on each ward and is given to each family. The pack contains Hospital Post Mortem Consent Form, which is completed by the doctor and next of kin. The pack also contains booklets about post mortem examinations, bereavement, and death issues

23.0 HOSPITAL BLOOD BANK SERVICE

23.1 Information for Blood Transfusion Requests from SVUH and SVPH

Consultant Haematologist in charge is Dr. J. Fitzgerald

23.1.1 Phlebotomy Instructions (For Blood Transfusion Samples & Forms)
Refer to Section 6.3 and 10.2 for guidelines on completing request forms, patient identification and labelling specimens. .**All blood transfusion samples should be taken using the Bloodtrack PDA labelling system.**

23.1.2 Group & Screen (Group & Hold/Type & Screen)
A Crossmatch Tube (pink capped) **filled** with 6mls of patient's blood is the required sample. The sample is grouped and screened for irregular antibodies. Max storage for patient samples is of 7 days. If a patient has been transfused within the preceding 3 months, the sample is only valid for 72 hours (3 days), after which time a new sample must be taken. This is in case the patient develops antibodies to the previously transfused red cells. Before taking a blood grouping sample, look up Ward Enquiry on LABS to check if a current valid sample is available. Under discipline press T for transfusion, this will ensure you only see transfusion records.
When filling out the blood bank request form please indicate the reason for the request/transfusion. For patients undergoing surgery please state the procedure; the blood requirements will be provided in line with the hospitals Maximum Surgical Blood Ordering Schedule (MSBOS).

23.1.3 Group Check Policy for Provision of Type Specific Crossmatched Blood
It is the Policy of SVUH blood bank that patients must have two confirmed blood groups recorded from separate phlebotomies prior to the issue of type specific blood. Where there is no historic blood group recorded for the patient two separately taken group and screen samples (taken at least 30 minutes apart) are required for the provision of type specific crossmatched blood.

23.1.4 Crossmatch
A valid group and screen sample, as outlined in 23.1.2 above, is required for crossmatching. Patients must have two confirmed groups on file if they require blood. The crossmatch can only be performed after the group and screen is complete. Two forms of crossmatching procedures are in place in SVUH:

a) The Electronic Crossmatch / Electronic Issue (E.I.):
This allows for the immediate issue of blood and applies to patients who have had more than one group and screen sample processed and have no history of antibodies.

b) The Serological Crossmatch:
This takes approximately 60 minutes to perform. If the patient has red cell antibodies the crossmatch may take longer.

c) First Time Sample only available with no historic blood group on file:
To prevent an ABO incompatible transfusion a serological crossmatch will be performed using O Rh specific RCCs.

23.1.5 Procedure for Requesting Blood & Blood Products
In SVUH and SVPH:
Requesting crossmatched red cells, platelets & plasma when a sample for Group and Hold has previously being sent.

Requesting human albumin solution, fibrinogen, Prothrombin Complex Concentrate and other factor concentrates.
Requests for Blood and Blood Products are made via the online ordering system available on the intranet. Select Favourites – Blood Product Ordering. Complete the details required and submit.
Alternatively send the completed request form to the hospital blood bank with the name of component / product required, the quantity /dose, date and time required, name and contact number of the person making the request via pneumatic tube to POD number 4449 or with Porter. In SVPH all requests are sent via the Satellite lab in SVPH and redirected to SVUH POD number 7053. Call the Blood bank on 4449 (on call bleep 465) if the request is urgent /or out of hours or to clarify time product availability.

All verbal/telephone requests for blood /blood products will need to be confirmed by an electronic or written request from the clinical area. However in the event of an urgent request/code red there will be no delay in issuing blood components/products, please follow with electronic request/request form ASAP.

23.2 Information for Blood Transfusion Requests from St. Michael's Hospital

Dr Mark Coyne is the Consultant Haematologist is in charge of Haemovigilance at St Michael's Hospital.

Crossmatched blood and blood products are provided by SVUH.

2 - 4 Emergency O negative RCC are held in Blood Fridge in SMH
Prothrombin Complex and 4g Fibrinogen are also available for Emergency issue in the Blood Fridge in SMH

Samples for crossmatching are sent by taxi or courier to SVUH Blood Bank.

23.2.1 Sending SMH Samples to SVUH

Routine Hours in SMH are 8am – 8pm Mon to Fri, 8am to 13.00pm Saturday. On call 1pm-8pm Saturday and 8am-8pm Sunday & Bank Holidays.
Bring Group & Screen and Group & Crossmatch Requests to SMH Laboratory for dispatch to SVUH Blood Bank. During these hours, both the dispatch of blood samples and receipt of crossmatched blood and blood products are the responsibility of SMH Pathology staff.

Routine Turnaround Times:
Group and Crossmatch - No Sample in SVUH: 3 hours and 1 hour travel.
Crossmatch - Sample in SVUH: 1 hour and 1 hour travel.

Outside Routine Hours:
All blood samples for transfusion should to be sent directly by the ward to SVUH Blood Bank by taxi. Remove the tracker slip from the request form before packing the sample in a diagnostic transport box. Bring the tracker slip to the laboratory as soon as possible.
Contact SVUH Haematology / Blood Transfusion Medical Scientist On-Call at 2214000 Bleep 465.
When Crossmatched blood is ready, SVUH Medical Scientist will contact the Nursing Director on call in SMH who will arrange transport for products to SMH.

*Turnaround Times for Urgent Samples
Group and Crossmatch - No Sample in SVUH: 1-2 hours and 1 hour travel.
Crossmatch - Sample in SVUH: 1 hour and1 hour travel.
* For urgent requests the requesting doctor at SMH must contact the SVUH blood bank directly.

In order to minimise delays, requests for elective surgery/transfusion should be made **before 13:00pm the** previous day. Blood ordered after this time may not be available before 11:30 a.m. on the following morning.

23.2.2 Ordering Blood Products in SMH

Blood Product should be ordered directly from SVUH Blood Bank (Ph: 2214449) / SVUH Haematology / Blood Transfusion Medical Scientist On-Call at 2214000 Bleep 465 or using the online 'Blood Orders' link on each PC in SMH.
Request for Platelets must be made 24 hours prior to use unless needed in an emergency.
An emergency supply of Octaplex and Fibrinogen is stored in SMH Blood fridge area. Advice can be sought from the Consultant Haematologist/On-call Haematologist in SVUH at 2214000 SVUH Switch.

23.2.3 Emergency Issue of Blood in SMH

2-4 units of O Rh D Neg suitable for emergency release are held in SMH Blood Fridge.
The responsibility for transfusing emergency blood lies with the requesting physician.

All verbal/telephone requests for blood /blood products will need to be confirmed by an electronic or written request from the clinical area. Call the Blood Bank on 2214449 (on call bleep 465) if the request is urgent /or out of hours or to clarify time of product availability.

23.3 Information for Blood Transfusion Requests from St. Columcille's Hospital

Dr. Claire Andrews is the Consultant Haematologist is in charge at St. Columcille's Hospital.

Crossmatched blood and blood products are provided by SVUH.
Samples for crossmatching are sent by taxi or courier to SVUH Blood Bank.
2 Emergency O Neg RCC are available in SCH

Prothrombin Complex is available for Emergency issue in SCH.

Routine Turnaround Times
Group and Crossmatch - No Sample in SVUH: 3 hours and 1 hour travel.
Crossmatch - Sample in SVUH: 1 hour and 1 hour travel.

All verbal/telephone requests for cross matched blood and blood products need to be confirmed by a written request form faxed to SVUH Bloodbank (fax no 2213995). Call the Blood bank on 2214449 (on call bleep 465) if the request is urgent /or out of hours or to clarify time of product availability.

23.3.1 Sending SCH samples to SVUH

Routine Hours in SCH are 09:00 am - 5:30 pm Mon to Fri and 09:00am to 12:30 pm Saturday
Samples are only sent to SVUH by the laboratory during SCH routine hours and through Switch in SCH outside of routine hours.

Both the dispatch of blood samples and receipt of crossmatched blood are the responsibility of SCH Pathology staff.
A copy of the request form is retained in SCH for tracking purposes and the sample is sent either with routine Eurofins Biomnis deliveries to SVUH or if urgent is sent via Taxi, during routine hours.
The SCH Pathology staff will contact SVUH Blood Bank on 01 221 4449 for urgent samples during routine hours.
Blood Transfusion samples outside of routine hours are handled by designated staff.
When Crossmatched blood is ready, SVUH Medical Scientist will contact the SCH Medical Scientist who will arrange transport for product to SCH. The ward will be contacted when the blood/product is available.

Outside of routine hours, when Crossmatched blood is ready, SVUH Medical Scientist will contact the Nursing Director on call in SCH who will arrange transport for products to SCH.

23.3.2 Ordering Blood Products in SCH

Blood Product should be ordered directly from SVUH Blood Bank (Ph: 2214449) / SVUH Haematology Medical Scientist On-Call at 2214000 Bleep 465.
Request for Platelets must be made 24 hours prior to use unless needed in an emergency..
An emergency supply of Octaplex is stored in SCH Blood Fridge. Advice can be sought from the Consultant Haematologist/On-call Haematologist.

23.3.3 Emergency Issue of Blood in SCH

2 units of O Rh D Neg suitable for emergency release are held in SCH Blood Fridge.
The responsibility for transfusing emergency blood lies with the requesting physician.

All verbal/telephone requests for blood /blood products will need to be confirmed by an electronic or written request from the clinical area. Call the Blood Bank on 2214449 (on call bleep 465) if the request is urgent /or out of hours or to clarify time of product availability.

23.4 Blood Transfusion Turnaround Times in SVUH and SVPH

Routine requests for Group & Screen 3 hours (approx).
Routine requests for Group & Crossmatch 3 hours (approx). Crossmatched blood is normally only held for 24 hours after the time for which it is requested. If it is necessary to hold blood for a longer time, the Blood Transfusion Laboratory must be informed.

As the supply of blood is not always predictable and as some patients present with incompatibility difficulties requiring extensive investigations, blood may not always be available at the desired time.
In order to minimise delays, requests for elective surgery/transfusion should be made **before 3:30 p.m.** the previous day. Blood ordered after this time will not be available before 10:30 a.m. on the following morning.

All staff that collect blood/ products from the laboratory must follow the Procedure for The Collection and Delivery of Blood Components to the Clinical Area (including use of Satellite Blood Fridges and Igloos) (PPG-ORG-209). Wards should not send persons to collect blood if they have not completed this training program or have not got a collection slip (FCT-ORG-51).

23.5 Emergency Issue of Blood for SVUH and SVPH

SVUH: There are 4 units of O Rh Negative blood on the Emergency Shelf in the Blood Bank Issue fridge

SVPH: There are 2-4 units of O Rh Negative blood on the Emergency Shelf in the SVPH blood fridge.

The responsibility for transfusing emergency blood lies with the requesting physician.

23.6 Blood Products

23.6.1 Red Cells

A current sample from the patient is required to crossmatch red cells prior to transfusion; see section 'Group and Screen'. Crossmatched blood should not be removed from the Blood Issue Fridge until the patient is ready for transfusion. If a delay subsequently occurs, the blood should be returned **immediately** to the Blood Fridge.
Blood must only be stored in a dedicated and controlled blood fridge. Units of red cells must never be placed in a ward fridge. Blood is normally only held for 24 hours after the time that it has been requested for but may be held for a longer time following a specific request to the Blood Transfusion Laboratory. However, if blood is being held for a patient that has been transfused in the preceding 3 months, a fresh Group and Screen sample must be sent to the Blood Transfusion Laboratory every 72 hours (see section 23.1.2 on 'Group and Screen').

23.6.2 SD Plasma (Octaplas LG)

Octaplas LG is not crossmatched, therefore it is not necessary to send a sample if the patient's blood group is on record. Octaplas LG is issued as ABO suitable only. There are 2-4 units of pre-thawed emergency release octaplas available for immediate use for major haemorrhage/Code Red Patients.
Please avoid over ordering this product as once it is defrosted it must be used within **8 hours** and it cannot be refrozen. Ideally it should be ordered in small quantities as required rather than one large order.
See PPG-ORG-214: Policy for Transfusion of Plasma

23.6.3 Fibrinogen Concentrate

Fibrinogen concentrate has replaced cryoprecipitate in the treatment of severe hypofibrinogenaemia. Fibrinogen concentrate is available in the hospital Blood Transfusion Laboratory.
See PPG-ORG-219: Policy for the Administration of Fibrinogen

23.6.4 Platelets

Platelets have a very short shelf life and are **not** always immediately available. There are two doses of emergency use platelets available for immediate issue. Platelets are not crossmatched so it is not necessary to send a specimen if the patient's blood group is on record. A doctor should order them when required on a named patient basis. **N.B. Platelets Must Never Be Placed In Any Fridge**

All platelets should be ordered by contacting the Blood Transfusion Laboratory during normal hours or the Haematology / Blood Transfusion Medical Scientist on–call (Bleep 465) outside hours. In an attempt to co-ordinate platelet ordering, please place all Haematology/Oncology orders with the Hospital Blood Transfusion Laboratory before 8.00am for delivery in am and before 14.00hrs to delivery in pm each day. This minimises transport costs and confines requests to the routine day.
See PPG-ORG-213: Policy for Platelet Transfusions

23.6.5 Albumin

5.0% Albumin (500ml) and 20% Albumin (100ml) are available from the Blood Transfusion Laboratory. Albumin must only be stored in the Blood Bank or in a designated Blood Fridge.
See PPG-ORG-216: Policy for Albumin Administration

23.6.6 Cytomegalovirus (CMV) Negative Products

CMV Negative products are required for pregnant patients/neonatal transfusions only.
If required complete Blood Transfusion Special Requirements Form (FCT-ORG-90) and send to Blood Transfusion Laboratory.
See PPG-ORG-208: Requesting of Blood Products with Special Requirements

23.6.7 Irradiated Products

Irradiated red cells and platelets are available from the Blood Transfusion Laboratory. If required complete Blood Transfusion Special Requirements Form (FCT-ORG-90) and send to Blood Transfusion Laboratory.
See PPG-ORG-208: Requesting of Blood Products with Special Requirements

23.6.8 Factor Concentrates

Factor concentrates available in the Blood Transfusion Laboratory: .Prothrombin Complex Concentrate (Octaplex), Recombinant FVIIa, Recombinant FVIII, Von Willebrand Factor, FIX.
N.B. It is recommended to seek advice from the Consultant Haematologist where possible prior to requesting Octaplex for the reversal of oral anticoagulants (Warfarin & DOACs) - refer to the section on Anticoagulation and Haematology in 'Guide Doc'. In all other cases (e.g. use of Octaplex for patients with liver failure or use of Recombinant FVIIa) a Consultant Haematologist must be contacted to approve the issue and dose of Factor Concentrates.
See PPG-ORG-217: Policy for Administration of Factor Concentrates

23.7 Maximum Surgical Blood Ordering Schedules (MSBOS)

MSBOS: Refer to PPG-ORG-206 'Referral of A Sample for Blood Group and Screen & Request for Crosshatched Blood'. Which is available on the Hospital Q-Pulse.

If blood usage is likely to be higher than recommended, the requesting doctor can over-ride the MSBOS by contacting the Blood Transfusion Laboratory at Ext: 4449.

23.8 Other Blood Transfusion Services

For information on other services such as investigation of a suspected transfusion reaction, Direct Coombs Tests, auto immune haemolytic anaemia, rare blood groups etc. contact the Blood Transfusion Laboratory directly at Ext: 4449.
For information on Stem Cell Harvesting contact the Cryobiology Laboratory at Ext: 4426 (or the Blood Transfusion Laboratory).

24.0 HISTOPATHOLOGY SERVICES

24.1 Frozen Sections

A ***frozen section*** service is offered between 08.00 – 18.00. Twenty Four hours' notice should be given to the laboratory, prior to a frozen section. Frozen sections outside usual working hours may be provided by prior arrangement with the Consultant Pathologist.
Specimens from patients with TB, HIV or Hepatitis B or C infection if at all possible should not be sent for frozen section. If such a suspicion is present, the medical staff concerned must inform laboratory personnel in order to safeguard the laboratory staff from risk of infection.
In addition, if the laboratory inadvertently processes such specimens, a decontamination procedure of the equipment required for frozen sections must be carried out. Decontamination of this equipment takes 24 hours. During this time no further frozen sections can be performed.
Frozen section reports are telephoned to the clinician / team.

24.2 Conferences

The following conferences occur on a regular basis in the Pathology Conference Room (unless stated):

Day of Conference	Type of Conference	Time of Conference	Final List	Slides to Pathologist
MONDAY	Sarcoma	7am (Fortnightly)*	Wednesday 12pm	Friday am
	Melanoma	7:30am (Fortnightly)*	Thursday 12pm	Friday pm
	Respiratory	8am (Weekly)*	Thursday 12pm (Late additions by Friday 12pm)	Friday pm
	Haempath MDT	9:30am (Weekly)	Thursday 12pm	Friday pm
	Breast (Screening)	1pm (Weekly – Breast Check)	Thursday 12pm	On request only
TUESDAY	Colorectal	7:30am (Weekly)	Thursday 3:30pm	Monday am
	Head & Neck	7.45am (Fortnightly)	Thursday 3:30pm	Monday pm
	Urology	8:30am (Weekly)	Thursday pm	Monday am
	Thyroid	1pm (Monthly – 2nd Tues each month)	Thursday 1pm	Monday am
WEDNESDAY	Pancreatic	7am (Weekly)	Friday 2pm	Tuesday am
	Gynaecological	10am (Fortnightly)	Friday 12pm	Tuesday am
	Dermpath	11:30am (Weekly)	Friday 2pm	Tuesday pm
	SCC (included in dermpath)	12pm (Fortnightly)	Friday 2pm	Tuesday pm
THURSDAY	Lymphoma	7am (Fortnightly)	Tuesday 12pm	Wednesday pm
	Medical Liver	10am (Weekly)	Tuesday 2pm	Wednesday pm
	Medical Renal	10am (Monthly)	Previous Friday	Wednesday am
	Rate Lung/ILD	12pm (Monthly) (Held in Radiology)	Monday am	Wednesday pm
	GIT	1:15pm (Weekly)	Wednesday am	Thursday am
FRIDAY	NET	7am (Fortnightly)	Friday 5pm	Thursday am
	Hepatobiliary	7am (Fortnightly)	Tuesday 2pm	Thursday pm
	Breast (symptomatic)	8am (Weekly)	Wednesday am	Thursday pm

*Respiratory MDT at 8:15am on the day of the Melanoma MDT. On the Monday following a bank holiday Sarcoma (7-7:30am) & Melanoma (7:30-8am) may occur.
Histology conference forms are available in the histology laboratory. Electronic copies are available from histolab@svhg.ie.
Ensure all patient details are fully filled in and leave a contact bleep number.
Requests received after the above cut-off times will only be processed if urgent clinical discussion is required. Adherence to the cut-off times is very important for workflow management in histology.

25.0 REFERRAL LABORATORIES – EXTERNAL SERVICES

Specialised tests not performed in SVUH are referred to external laboratories. Specimens for referral laboratories are dispatched from Clinical Chemistry, Microbiology, Immunology and Histopathology. When results are received from the referral laboratory the original report is forwarded to the requesting clinician with the exception of some histology reports e.g. Renal EM, Molecular tests such as ALK, BRCA, CKIT, Oncomine panel etc. which are sent out as Supplementary Reports to the Histology APEX report. Referral Laboratories are detailed in the Test Information section below.

PART 2 – TEST INFORMATION

TEST REQUIREMENTS

Introduction

This portion of the manual contains an alphabetic listing of the tests available from the Department of Pathology & Laboratory Medicine. Each test is described under the headings: type of specimen required, tube/container type and volume of specimen required, reference interval/ clinical decision level, turnaround time and special handling needs for each test.
Note: For information related to the derivation and specific considerations related to the paediatric population and pregnancy related reference ranges for Clinical Chemistry and Haematology, refer to section 16.0 Reporting of Results, Clinical Advice and Interpretation.

Tests are colour coded by Department as follows:

Clinical Chemistry	(Clinical Chemistry Referred)
Haematology	(Haematology Referred)
Blood Bank	
Histology/Cytology	
Microbiology	(Microbiology Referred)
Immunology	

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
5HIAA	Urine	24hr urine collection in an acid containing 24 hr urine container (see comments)	10 days	< 50 umol/24h	Clinical Chemistry Dispatch	Referred to Outside Laboratory (Eurofins Biomnis). Special container with instructions available from Clinical Chemistry. Instructions will be explained to patient at the time of collection of container. Specimen container must be kept upright at all times. Warning label 'This bottle contains strong acid preservative' must be attached to bottle.
16S rDNA Bacterial PCR	Fluids from normally sterile sites, tissue samples	Sterile Universal container	15 days	N/A	Microbiology Dispatch	Referred to PHE Colindale, Molecular Identification Services Unit (MISU)
18S rDNA Panfungal PCR	Fluids from normally sterile sites	Sterile Universal container	16 days	N/A	Microbiology Dispatch	Referred to PHE Bristol, Mycology Reference Laboratory
Acanthamoeba DNA	Dry swab, Corneal scraping, contact lens	Swab, sterile universal container	Results faxed next working day	N/A	Microbiology Dispatch	Referred to Micropathology Ltd., Warwick
Acetaminophen (Paracetamol)	Blood	Serum Gold Cap 5 mL	90 mins	See Comments	Clinical Chemistry	For interpretation following a single acute ingestion, refer to new paracetamol nomogram. Toxicity is related post-dose interval typically: >100mg/L at 4 h, >50mg/L at 8 h and if paracetamol is detected 15h or more hours post-ingestion. Please refer to SVUH Oral Paracetamol Overdose Integrated Care Pathway for Adults (Effective from 14/11/2012). Lower Paracetamol levels are used if patient is higher risk. The time of ingestion should be stated on the request form (if known), together with the date and time of specimen collection. Specimens taken less than 4 h post-ingestion are not considered useful for prediction of toxicity. Samples must be analysed within 24h of collection. Paracetamol levels are not appropriate for the assessment of chronic use. Please be aware that high concentrations of N-Acetylcysteine and the Acetaminophen metabolite N-acetyl-p-benzquinone imine (NAQPI) independently may cause falsely low Creatinine results.

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
ACTH	Blood	EDTA Lavender Cap 3 mL	7 days Weekly	Early AM Rang 7-63 ng/L Please note: That the Reference Interval provided has been supplied by the manufacturer and is derived from apparently healthy adults. Please interpret accordingly.	Clinical Chemistry	Samples should be placed on ice and delivered to the laboratory immediately. ACTH levels greater than 2,000ng/L are reported as >2,000ng/L Biotin may cause some concentration dependent negative interference in this assay if high dose supplements are taken. If this is suspected, a repeat request 8 plus hours off Biotin is recommended in the first instance. Please contact the Duty Scientist on Ext 3127 for further details.
Activated Protein C resistance. APCR	Blood	Sodium Citrate Light Blue cap 3 mls.	6 - 8 weeks	2.1 – 8.0 Ratio	Haematology	Tests done in batches unless requested urgently. See Thrombophilia Screen Sample Stability: 4hrs post collection.
ADAMTS 13 Activity & Antibody See Von Willebrand Cleaving Protease	Blood	Sodium Citrate Light Blue cap 3 mls x 2. Serum for Ab Level.	14 days	See Report	Haematology Referred	Samples must be sent immediately to the Coagulation lab for separation and freezing. Specimens Referred to HSL Haemostasis Laboratory, London. HSL Request form required.
Adalimumab (Humira Antibody)	Blood	Serum Gold Cap 5mls	20 days	See report	Immunology	Specimens Referred to Eurofins Biomnis.
Adenosine Deaminase in Tuberculosis (ADA)	Pleural or ascitic fluid or CSF	Freeze at -70c or send immediately 1ml sample required				Referred to Dr Lynette Fairbanks, Purine Research Laboratory, 4th Floor, North Wing, St Thomas' Hospital, Lambeth Palace Road, London SE1 7EH Tel: 0207 188 1266 **SMH** - samples not suitable to be taken in SMH no -70c freezer and no transport option for -70c
Adenovirus culture	Respiratory secretions	Sterile Universal Container	24 days	N/A	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin.
Adenovirus immunofluorescence	Respiratory secretions	Sterile Universal Container	7 days	N/A	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin.
Adenovirus PCR - respiratory – see respiratory virus screen	Respiratory secretions	Sterile Universal Container	By arrangement	N/A	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin.

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Adenovirus PCR - faeces – see gastroenteritis virus screen	Faeces	Sterile Universal Container	9 days	N/A	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin.
Adenovirus PCR - blood	Blood	EDTA Lavender Cap 3 ml	9 days	N/A	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin.
AFP	Blood	Serum Gold Cap 5mL	Daily Mon - Fri	0-5.8 kU/L	Clinical Chemistry	Tumour marker results of a patient's sample can vary depending on the testing procedure used. Values determined on patient samples by different testing procedures cannot be directly compared with one another and could be the cause of erroneous medical interpretations. It is therefore advised to have this test measured in the same laboratory for the duration of treatment and follow-up. Method used – Roche Immunoassay Most useful in germ cell tumours and hepatocellular cancer. 1 kU/L is equal to 1.21 ng/mL (Reference - UK NEQAS for AFP Literature Survey: Distribution 341) Tumor marker results can be used as an aid to cancer management but not as a case finding approach or general screen for cancer. Biotin may cause some concentration dependent negative interference in this assay if high dose supplements are taken. If this is suspected, a repeat request 8 plus hours off Biotin is recommended in the first instance. Please contact the Duty Scientist on Ext 3127 for further details.
Alanine Aminotransferase (ALT)	Blood	Serum Gold Cap 5mL	4 hours	9 - 59 U/L (male) 8 - 41 U/L (female)	Clinical Chemistry	Part of LFT profile. If ordered alone and >123 U/L remaining LFTs added automatically by IT rule. If ALT is >300 U/L, AST is added automatically by IT rule. For Patients on Sulfasalazine and / Sulfapyridine please collect blood samples before the dose is given or 7-8 hours post dose to minimise analytical interference.
ALB (Albumin)	Blood	Serum Gold Cap 5mL	4 hours	35 - 50 g/L	Clinical Chemistry	Avoid Venostasis. See note on calcium or other albumin bound parameters. Calculated Globulin is reported where serum Albumin and serum Total Protein are measured. Calculated Globulin Reference Interval = 25 to 40 g/L
Albumin excretion rate (AER)	Urine	Overnight timed or 24 hour urine	20 days	Normoalbuminuria < 20 ug/min, Microalbuminuria	Clinical Chemistry	Protocol available from Lab. The date and time of the start and finish of the collection must be clearly indicated. Calculation ; Albumin Excretion Rate (ug/min) = [(Albumin (mg/L) x

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
				20-200 ug/min, Macroalbuminuria > 200 ug/min		Volume (L)) / Time (min)] x 1000
Urine Albumin/Creatinine Ratio (ACR)	Urine	Universal Container Minimum urine collection volume is 5 mL	3 days	Normoalbuminuria: < 3.0 mg/mmol, Microalbuminuria: 3-25 mg/mmol Macroalbuminuria: >25 mg/mmol	Clinical Chemistry	
Ethanol	Blood	Fluoride Oxalate - Grey Cap.	4 hours	N/A	Clinical Chemistry	Results are not for medico-legal purpose.100 mg% ethanol is equivalent to 21.7mmol/L. Blood should be sent in a fluoride oxalate tube (Grey top tube).
Aldosterone	Blood	Serum Gold Cap 5mL	20 days	Upright 106 - 870 pmol/L	Clinical Chemistry	Referred to Eurofins Biomnis. Indicate posture.
Aldosterone: PRA Ratio	Blood	See Comment	20 days	20 - 750	Clinical Chemistry	This is a calculated test. See PRA and Aldosterone for specimen requirements. Only to be received in SVUH on Monday and Tuesday before 12.
ALK (NSCLC) Immunohistochemistry	Tissue/ Cytology		10 days	See Report	Histology	To request test phone Immunohistochemistry Lab (Ext. 4797)
ALP (Alkaline Phosphatase)	Blood	Serum Gold Cap 5mL	4 hours	Adults 30-130U/L *	Clinical Chemistry	* Alkaline Phosphatase levels in children and adolescents are highly variable and may be up to 4 times the upper limit of the adult range.
Allergen Specific IgE				See Comments		Positive tests for specific allergens indicate exposure to allergen but do not necessarily correlate with symptoms of allergy. A negative result means that IgE mediated allergy to this allergen is unlikely. All results should be interpreted in the light of the clinical history. For specific IgE to food allergens, please specify the individual allergen specific IgE required. Minimum retesting interval: Not routinely required.

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Allergen: Aspergillus Fumigatus	Blood	Serum Gold Cap 5mls	10 days	<0.35 kU/L	Immunology	
Allergen: Cat dander	Blood	Serum Gold Cap 5mls	10days	<0.35 kU/L	Immunology	
Allergen: Dog dander	Blood	Serum Gold Cap 5mls	10 days	<0.35 kU/L	Immunology	
Allergen: Egg white	Blood	Serum Gold Cap 5mls	10days	<0.35kU/L	Immunology	
Allergen: Grass Mix	Blood	Serum Gold Cap 5mls	14 days	Negative (<0.35kU/L)	Immunology	Grass Mix contains: cocksfoot, meadow fescue, rye grass, timothy grass, meadow grass (Kentucky blue)
Allergen: House Dust Mite	Blood	Serum Gold Cap 5mls	10 days	< 0.35 kU/L	Immunology	
Allergen: Latex	Blood	Serum Gold Cap 5mls	10 days	<0.35 kU/L	Immunology	Specific IgE <0.35 does not exclude latex allergy.
Allergen: Milk	Blood	Serum Gold Cap 5mls	10 days	<0.35 kU/L	Immunology	
Allergen: Mould Mix	Blood	Serum Gold Cap 5mls	14 days	Negative (<0.35kU/L)	Immunology	Mould mix contains: Penicillum C, Cladosporium H, Apergillus F, Candida A, Alternaaria A, Setomelanomma R
Allergen: Peanut	Blood	Serum Gold Cap 5mls	10days	< 0.35 kU/L	Immunology	
Allergen: Soya bean	Blood	Serum Gold Cap 5mls	10 days	< 0.35 kU/L	Immunology	
Allergen: Tree Mix	Blood	Serum Gold Cap 5mls	14 days	Negative (<0.35kU/L)	Immunology	Tree Mix Contains: Box Elder, Silver Birch, Hazel, Oak, and Sycamore.
Allergen: Weed Pollen Mix	Blood	Serum Gold Cap 5mls	14 days	Negative (<0.35kU/L)	Immunology	Weed mix contains: Common pigweed, Mugwort, plantain (English) Mugwort, Goosefoot, Lambs quarters, Saltwort (prickly), Russian thistle
Allergen: Wheat	Blood	Serum Gold Cap 5mls	10 days	<0.35 kU/L	Immunology	
Allergen: penicillin	Blood	Serum Gold Cap 5mls	10 days	< 0.35 kU/L	Immunology	
Other Allergens	Blood	Serum Gold cap 5mls	14 days	See report	Immunology	Specimens Referred to Eurofins Biomnis.
Alpha-1-Antitrypsin (A1AT)	Blood	Serum Gold Cap 5mls	14 days	Age and gender related reference ranges. See report	Immunology	Specimens Referred to Eurofins Biomnis. Alpha 1 Antitrypsin is an acute phase reactant; as such it may increase with inflammation. This should be taken into account when interpreting a single measurement. Reduced levels are associated with emphysema and cirrhosis.

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Alpha-1-Antitrypsin Phenotype (A1AT)	Blood	Serum Gold Cap 5mls	28 days	See report.	Immunology	Specimens Referred to Eurofins Biomnis.
α Galactosidase A	See Fabry					
Ammonia	Blood	EDTA Lavender Cap 3 mL	2 hours Lab MUST be phoned prior to sending samples	Males 16 – 60 umol/L Females 11 – 51 umol/L	Clinical Chemistry	The Patient sample must be taken into EDTA Lavender container *on ice*- and sent directly to laboratory, should be received within 20 minutes of collection. This test is only available internally at SVUH due to sample stability issues.
Amikacin	Blood	Serum Gold Cap 5mL	Daily	See Report	Clinical Chemistry	Samples must be analysed within 24 hours of collection. Target level is <5 mg/L for ALL patients. Ensure dose was calculated correctly and verify that level was taken >16 hours post-dose. If advice on dosing is required the Clinical Microbiology team can be contacted at extension 4949/3459 or out of hours via the switchboard. Trough level <5 mg/L Maintain dosing regimen. Trough level ≥5 mg/L Hold dose and repeat level next day. Do not re-dose until level <5 mg/L.
Amoebic Abs	Blood	Serum Gold Cap 5mls	13 days	See Report	Microbiology Dispatch	Referred to Hospital for Tropical Diseases London.
Amylase	Blood	Serum Gold Cap 5mL	4 hours	28 - 100 U/L	Clinical Chemistry	
Urine Amylase	Urine	Sterile Universal Container - Timed Collection	Same day if received before 15:30	1 - 17 U/Hour	Clinical Chemistry	Please state duration of urine collection.
Androstenedione	Blood	Serum Red Cap (non gel) 5mL	weekly	Female: 1.7-4.6 nmol/L Male : 1.0-5.3 nmol/L	Clinical Chemistry	Exemestan interferes and will significantly increase results.
Angiotensin Converting Enzyme (ACE)	Blood	Serum Gold Cap 5mL	Daily (Mon-Fri)	Adults: 8 - 65 U/L *	Clinical Chemistry	*The serum ACE reference interval provided is for those >14 years old. Higher plasma ACE levels may be found in healthy children and adolescents. Treatment with ACE Inhibitors may reduce ACE activity measurements in plasma. Not available to external users.
Anti-Acetycholine Receptor (AChR) Antibody.	Blood	Serum Gold Cap 5mls	4-6 weeks	Negative	Immunology	Specimens Referred to Oxford University Hospitals (UK). First line screen for anti-AcHRabs is IIF fixed cell screen. New and known anti-ACHR positive will be quantified by RIA. Where clinical suspicion remains high, and first line IIF fixed cell screen is negative, cluster (anti -AChR, MUSK and LP4 abs) will be measured

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
						by live cell-based assay which is more sensitive. Anti-acetylcholine receptor antibodies are strongly associated with myasthenia gravis but the test may be negative in approximately 10-15% of patients with this disorder.
Anti-Adrenal Antibody	Blood	Serum Gold Cap 5mls	20 days	< 5 (titre)	Immunology	Specimens Referred to Eurofins Biomnis. Anti-adrenal antibodies are found in patients with Addison's disease and also in patients with autoimmune polyglandular syndrome
Anti-AMPA 1 antibodies Anti-AMPA 2 antibodies Anti-GABAbR antibodies All three tested together	Blood	Serum Gold Cap 5mls	4-6 weeks	Negative	Immunology	Specimens Referred to Oxford University Hospital (UK). Antibodies to glutamate receptors AMPA1 and AMPA2, and the metabotrophic GABA-B receptor have been reported in patients with limbic encephalitis, often associated with tumours but usally showing good immunotherapy responses.
Anti-Aquaporin-4 antibodies (also known as NMO antibodies)	Blood	Serum Gold Cap 5mls	4 – 6 weeks	Negative	Immunology	Specimens Referred to Oxford University Hospital (UK). NMO-IgG was first described by Lennon et al in 2004 in around 65% of patients with neuromyelitis optica (NMO, also called Devic's disease). Aquaporin 4 was subsequently defined as the major NMO-IgG antigen by the same group.
Anti - Beta 2 Glycoprotein 1	Blood	Serum Gold Cap 5mls	7 days	See Report	Haematology Referred	Referred to Eurofins Biomnis.
Anti Cardiolipin Antibodies [ACA]	Blood	Serum Gold Cap	10 days	ACA IgG (GPL-U/mL) ACA IgM (MPL-U/mL) < 10 U/mL Negative 10-40 U/mL Equivocal >40 U/mL Positive	Immunology	Assay includes IgG and IgM antibodies.
Anti-Centromere Antibodies (ACM)	Blood	Serum Gold Cap 5 mls	7 days	Negative <80 (titre)	Immunology	Anti-centromere is an ANA pattern, which is detected by ANA screening. It does not need to be requested as a separate test along with ANA requests. Anti-centromere antibody is typically associated with CREST syndrome (Calcinosis, Raynaud's phenomenon, Oesophageal dysmotility, Scherodactyly and Telangiectasia). It is also seen in patients with scleroderma and in 13% of patients with primary biliary cirrhosis.

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Anti-Cyclic Citrinullated Protein (CCP) antibody	Blood	Serum Gold Cap 5mls	7 days	< 7 U/mL Negative 7-10 U/mL Equivocal >10 U/mL Positive	Immunology	This antibody appears to be more specific (approximately 90%) for rheumatoid arthritis than rheumatoid factor. Minimum retesting interval: 12 weeks
Anti dsDNA (EliA)	Blood	Serum Gold Cap 5 ml	7 days	<10 IU/mL Negative 10-15 IU/mL Equivocal >15 IU/mL Positive	Immunology	Performed when ANA is positive with a titre of 1:400 or greater. Minimum retesting interval: Every 3–6 months while on treatment
Anti-double stranded DNA (dsDNA) antibodies (C. luciliae)	Blood	Serum Gold Cap 5mls	10 days	Negative <10 (titre)	Immunology	Performed as follow-up test in samples that are anti-dsDNA screen positive by immunoassay on Phadia250. Detection of anti-dsDNA using C. luciliae is a more specific test. Strongly positive anti-dsDNA is suggestive of SLE.
Anti-Endomysial Antibodies (IgA) (EMA)	Blood	Serum Gold Cap- 5ml	12 days	Negative <10 (titre)	Immunology	Assay only performed if anti-tTG is positive. Anti-EMA antibodies are highly specific for coeliac disease
Anti-ENA (Extractable Nuclear Antigen) antibodies. Test includes anti-RNP, anti-Sm, Anti-SSA (Ro) Anti-SSB (La), anti-Scl-70 and anti-Jo-1	Blood	Serum Gold Cap 5mls	30 days	ENA Screen <0.7 Ratio Negative 0.7-1.0 Ratio Equivocal >1.0 Ratio Positive	Immunology	When ANA is positive 1:400 or greater an anti-ENA screen is performed. When positive, sample is further tested for antibodies to the individual antigens. In general, repeat testing is unhelpful. Anti-RNP antibodies are found in mixed connective tissue disease and approximately 30% of patients with SLE. Anti-Sm antibodies are found in 15-20% of patients with SLE and are specific for this condition. Anti-Ro antibodies are found in approximately 70% of patients with Sjogrens Syndrome, and approximately 30% of patients with SLE, but may also be found in other connective tissue diseases. Anti-La antibodies are usually only found in association with anti-Ro antibodies. They are found in 25-50% of patients with Sjogren's Syndrome and 10-15% of SLE patients. Anti-Jo-1 antibodies are associated with the anti-synthetase syndrome (polymyositis and interstitial lung disease). Anti-Scl 70 antibodies are found in 20-40% of patients. Minimum retesting interval: Repeat testing of limited value – frequency to be determined by clinical context
Anti-RNP, anti-Sm, Anti-SSA (Ro) Anti-SSB (La), anti-Scl-70,	Blood	Serum Gold Cap 5mls	14 days	<7 U/ml Negative 7-10 U/ml Equivocal >10 U/mL Positive	Immunology	When ENA Screen test is positive, sample is further tested for antibodies to the individual antigens. In general, repeat testing is unhelpful.

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
anti-Jo-1 and anti-Centromere						
Anti-Gastric Parietal Cell Antibodies (PCA)	Blood	Serum Gold Cap 5mls	10 days	Negative <20 (titre)	Immunology	Anti-gastric parietal cell antibodies are found in approximately 90% of patients with atrophic gastritis and pernicious anaemia. They may also be found in patients with other autoimmune endocrine disorders and in the healthy relatives of patients.
Anti-Glutamic acid Decarboxylase (anti-GAD)	Blood	Serum Gold Cap 5mls	4-6 weeks	0 - 5 U/mL	Immunology	Specimens Referred to Oxford University Hospitals (UK). These antibodies are found in approximately 80% of newly diagnosed type 1 diabetes and in stiff man syndrome
Anti-Glomerular Basement Membrane (GBM) antibodies (EliA)	Blood	Serum Gold Cap 5mls	5 days	< 7 U/mL Negative 7 -10 U/mL Equivocal >10 U/mL Positive	Immunology	This test is available on an urgent basis by arrangement with the laboratory. A positive anti GBM is associated with Goodpasture's Syndrome (anti GBM disease).
Anti-Glomerular Basement Membrane (GBM) antibodies (ELISA test)	Blood	Serum Gold Cap 5mls	5 days	<20 RU/ml Negative	Immunology	All positive anti-GBM by EliA will be verified by ELISA assay.
Anti-GM1 antibodies (Ganglioside antibodies)	Blood	Serum Gold Cap 5mls	4-6 weeks	Negative	Immunology	Specimens Referred to Oxford University Hospitals (UK). Anti-ganglioside (GM1) antibodies are associated with Guillan-Barré syndrome.
Anti-GQ1b antibodies (Ganglioside antibodies)	Blood	Serum Gold Cap 5mls	4-6 weeks	Negative	Immunology	Specimens Referred to Oxford University Hospitals (UK). Anti-ganglioside (GQ1) antibodies are associated with Miller Fisher syndrome.
Anti-Insulin Antibodies	Blood	Serum Gold Cap 5mls	20 days	0-5.5 %	Immunology	Specimens Referred to Eurofins Biomnis. Anti-insulin antibodies are found in approximately 30% of patients with type 1 diabetes. Samples must be sent immediately to laboratory for separation and freezing (within one hour).
Anti-Intrinsic Factor Antibodies	Blood	Serum Gold Cap 5mls	14 days	< 7 U/mL	Immunology	Specimens Referred to Eurofins Biomnis. The presence of these antibodies is associated with pernicious anaemia.
Anti-LKM (Liver Kidney Microsomal) antibodies	Blood	Serum Gold Cap 5mls	7 days	Negative <20 (titre)	Immunology	Anti-LKM antibodies are associated with type II autoimmune hepatitis but may also be seen in hepatitis C.

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Anti-liver antibodies – extended panel (anti-M2, anti-LKM, anti-sp100, anti-gp210, anti-PML, anti-SLA/LP, anti-LC-1)	Blood	Serum Gold Cap 5mls	21 days	Negative	Immunology	All liver antibody requests will be tested using a first line IIF (fluorescence) tests for ANA, anti-mitochondrial antibody, anti-smooth muscle and anti-LKM antibodies. Extended panel of liver antibodies will be tested using an immunoblot assay to confirm anti-LKM and anti-mitochondrial (anti-M2); or to investigate the presence of other clinically relevant autoantibodies.
Anti-MAG (Myelin associated glycoprotein)	Blood	Serum Gold Cap 5mls	4-6 weeks	Negative	Immunology	Specimens Referred to Oxford University Hospitals (UK). These antibodies are associated with chronic sensory neuropathies.
Anti-Mitochondrial Antibodies (AMA)	Blood	Serum Gold Cap 5mls	7 days	Negative <20 (titre)	Immunology	Anti-mitochondrial antibodies (M2 pattern) are usually associated with (primary biliary cirrhosis (PBC). Confirmatory test for anti-M2 antibodies performed on positive samples.
Anti-Myelin Oligodendrocyte Glycoprotein (MOG) antibody	Blood	Serum Gold Cap 5mls	4-6 weeks	Negative	Immunology	Specimens Referred to Oxford University Hospitals (UK). Myelin Oligodendrocyte glycoprotein antibodies have been reported in some children (but few adults) with ADEM or MS, and more recently in patients with neuromyelitis optica negative for AQP4 antibodies (Kitley, Woodhall et al Neurology in press 2012)..
Anti-M2 antibodies (Anti Mitochondrial antibodies subtype M2)	Blood	Serum Gold Cap 5mls	14 days	Negative	Immunology	Follow-on test performed only on AMA (mitochondrial antibody) positive samples. Anti M2 antibodies are highly specific for primary biliary cirrhosis.
Anti-MPO	Blood	Serum Gold Cap 5mls	5 days	<3.5 IU/ml Negative >5 IU/ml Positive 3.5-5 IU/ml Equivocal	Immunology	Samples are screened by indirect immunofluoresence for ANCA. If positive, anti-PR3 and anti-MPO tests follow. This test is available on an urgent basis by arrangement with the laboratory. P-ANCA with anti-MPO specificity occurs in 50-80% of patients with microscopic polyangitis (MPA), and in up to 20% of patients with GPA Minimum retesting interval: On treatment: 6 months Off treatment: annually
Anti Mullerian Hormone (AMH)	Blood	Serum Gold Cap 5mL	7 days	Refer to report	Clinical Chemistry Dispatch	Specimens referred to National Maternity Hospital, Holles Street. This test is only available for patients undergoing infertility investigations. Please state clearly on the request form the purpose of requesting. If no clinical details are provided this request cannot be processed.

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Anti-MuSK (Muscle specific kinase) antibodies.	Blood	Serum Gold Cap 5mls	4-6 weeks	Negative	Immunology	Specimens Referred to Oxford University Hospitals (UK). First line screen for anti-MUSK is IIF fixed cell screen. Where clinical suspicion remains high, and first line IIF fixed cell screen is negative, cluster (anti -AChR, MUSK and LP4 abs) will be measured by live cell-based assay which is more sensitive. Anti-MuSK antibodies are found in approximately 40% of patients with myasthenia gravis with negative anti-acetylcholine receptor antibody.
Anti-Neuronal antibodies (first line immunoblot test includes anti-Hu, Yo Ri, Tr, Ta(Ma2), Amphiphysin, RMP/CV2, Zic4, SOX1, Titin and Recoverin antibodies)	Blood	Serum Gold Cap 5mls	4-6 weeks	0-200 (titre)	Immunology	Specimens Referred to Oxford University Hospitals (UK). Associated with paraneoplastic syndromes affecting the nervous system. **Any positive immunoblot Hu/Ri/Yo results will be confirmed by secondary testing by immunfluorescent slide.**
Anti-Neutrophil Cytoplasmic Antibodies (ANCA) includes C-ANCA and P-ANCA	Blood	Serum Gold Cap 5 mls CSF not required although can be tested.	5 days	Negative <20 (titre)	Immunology	This test is available on an urgent basis by arrangement with the laboratory. Samples are screened by indirect immunofluorescence for ANCA. If positive anti-PR3 and anti-MPO tests follow. This test is available on an urgent basis by arrangement with the laboratory. Negative ANCA makes vasculitic diseases less likely. C-ANCA is positive in over 90% of patients with generalised granulomatosis with polyangitis (GPA) and in 30% of patients with microscopic polyarteritis. P-ANCA with MPO specificity occurs in 50-80% of patients with microscopic polyangitis and up to 25% of patients with GPA. Minimum retesting interval: On treatment: 6 months Off treatment: annually
Anti-Neutrophil Antibodies	Blood	Serum Gold Cap and EDTA Lavender Cap	28 days	See Report	Haematology Referred	EDTA required for WCC and Neutrophil count. Referred to H+I Filton, NHS Blood and Transplant, Bristol. Samples must be received into lab before 11.30 for same day dispatch.
Anti-NMDA Receptor Antibodies	Blood & CSF	Serum Gold Cap 5 mls CSF 0.5 mL	4-6 weeks	Negative	Immunology	Referred to Oxford University Hospital. Paired serum and CSF are required
Anti-Nuclear Antibody	Blood	Serum Gold Cap 5 mls	7 days	Negative <80 (titre)	Immunology	Samples are screened at 1/80 dilution. Staining pattern and titre are

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
(ANA)						reported on positive samples. Negative ANA makes connective disease unlikely. Weak positive is unlikely to be clinically significant. Strongly positive ANA are more likely to be associated with connective tissue disease. The occurrence of ANA may increase with age, infection, malignancy, therapy with certain drugs and a range of inflammatory disorders. Minimum retesting interval: Minimum retesting interval: every 6 months while on Treatment.
Anti-phospholipase A2 receptor antibody	Blood	Serum Gold-cap 5 mL	10 days	0 -14 RU/mL Negative	Immunology	Referred to Protein Reference Unit, PO Box 894 SHEFFIELDS5 7YT DX Number: DX6261402 Anti-phospholipase A2 receptor antibody are associated with adult idiopathic membranous nephropathy (MN),
Anti-Phospholipid Antibodies - see Lupus Screen						
Anti-PR3	Blood	Serum Gold Cap 5mls	5 days	<2.0 IU/ml Negative >3 IU/ml Positive 2.0 – 3.0 IU/ml Equivocal	Immunology	Samples are screened by indirect immunofluorescence for ANCA. If positive, anti-PR3 and anti-MPO tests follow. This test is available on an urgent basis by arrangement with thee laboratory. C-ANCA with anti-PR3 specificity is positive in over 90% of patients with generalised granulomatosis with polyangitis (GPA) Minimum retesting interval: On treatment: 6 months Off treatment: annually
Anti-Ovarian Antibodies	Blood	Serum Gold Cap 5mls	20 days	< 5 (titre)	Immunology	Specimens Referred to Eurofins Biomnis.
Anti-Skin antibodies (associated with blistering skin disorders pemphigus and pemphigoid)	Blood	Serum Gold Cap 5mls	20 days	Negative	Immunology	Specimens Referred to St. Thomas's Hospital, Dermatology . Antibodies against basement membrane zone antigen are found in bullous pemphigoid and its variants. Antibodies against the epidermal adhesion molecules are associated with pemphigus vulgaris and its

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
						variants
Anti-Smooth Muscle Antibodies (SMA)	Blood	Serum Gold Cap 5mls	7 days	Negative <20 (titre)	Immunology	Elevated levels of anti-smooth muscle antibodies may be found in a variety of infectious disorders and in autoimmune hepatitis. Higher levels are more often associated with autoimmune hepatitis.
Anti-Streptolysin O titre (ASO)	Blood	Serum Gold Cap 5mls	7 days	See Report	Microbiology Dispatch	Referred to Eurofins Biomnis Labs.
Anti-Striated muscle antibody	Blood	Serum Gold Cap 5mls	2 weeks	Negative	Immunology	Specimens Referred to Eurofins Biomnis. These antibodies are present in patients with myasthenia gravis (MG). 80-90% patients with MG and thymoma are positive for these antibodies.
Anti-tTG (tissue transglutaminase) IgA antibodies	Blood	Serum Gold Cap 5mls	7 days	< 7 U/mL Negative 7-10 U/mL Equivocal >10 U/mL Positive	Immunology	Anti-tTG antibodies (IgA) are strongly associated with coeliac disease. An anti-EMA (IgA) test will follow all positive tests. Minimum retesting interval: 3 months
Anti-Thyroglobulin antibodies						See below under Thyroglobulin please
Anti-Thyroid Peroxidase (Anti-TPO)	Blood	Serum Gold Cap 5mL	5 days	0-34 kIU/L	Clinical Chemistry	Measurement of Anti-TPO Antibodies is recommended where autoimmune hypothyroid disease is suspected on a once off basis, that is, there is no value to serial measurement. High levels of Anti-TPO antibodies indicate current or future risk of autoimmune thyroid disease. Thyroid function tests should be checked. Minimum retesting interval: Not routinely required. In general repeat testing is unhelpful.
Anti-Thrombin	Blood	Sodium Citrate Light Blue Cap 3 mls	4 - 6 weeks	82 - 118 IU/dL	Haematology	Tests done in batches unless requested urgently. See Thrombophilia Screen. Sample stability = 4 hrs post collection.

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Anti-TSH (Thyroid stimulating hormone) Receptor Antibodies	Blood	Serum Gold Cap 5mls	14 days	< 1.75 IU/mL	Immunology	Specimens Referred to Eurofins Biomnis. Associated with Grave's disease. Due to uncertainty of measurement of this method near the positivity cut-off, results between 1.40 and 2.10 IU/L must be interpreted with caution and in clinical context and a repeat sample is advised.
Anti-VGCC (Voltage gated calcium channel) antibodies	Blood	Serum Gold Cap 5mls	4-6 weeks	0 - 45 pmol/L	Immunology	Specimens Referred to Oxford University Hospitals (UK). These antibodies are associated with the Lambert-Eaton myasthenic syndrome
Anti-VGKC (Voltage gated potassium channel) antibodies	Blood	Serum Gold Cap 5mls	4-6 weeks	0 – 69 pmol/L Negative 70-130 pmol/L Equiv >130pmol/L Positive	Immunology	Specimens Referred to Oxford University Hospitals (UK). All VGKC antibody requests will be teste using a first line IIF (fluorescence) test for anti-LGI1 and CASPR2 antibodies. CASPR2 and LGI1 are one of the VGKC-complex protiens.Anti-CASPR2 antibodies are found mostly in patients who have Morvan syndrome. LGI1 antibodies are frequent in limbic encephalitis, with low plasma sodium and are often associated with a particular seizure type called faciobrachial dystonic seizures.
Anti Xa Assay [heparin assay]	Blood	Sodium Citrate Light Blue Cap 3 mls	Urgent 6hrs	See Report	Haematology	Tests done in batches weekly unless requested urgently. Used to monitor certain patients on low molecular weight heparin. Contact Coagulation laboratory (ext.4395) to pre-arrange assay. Samples should be taken 4 hrs after last injection of Heparin. Sample stability = 1 hr post collection. Bring to laboratory immediately.
Antral Washout (AWO)	AWO	Sterile Universal	48-96hrs	N/A	Microbiology	Mycology culture also routinely performed on all AWO specimens.
APML Testing t(15:17) or PML-RAR alpha	Bone Marrow Aspirate or Blood	Bone Marrow in ** RPMI or EDTA 6mls	28 days	Not Applicable	Haematology Referred	Useful for Promyelocytic leukaemia. ** Containers available from Haematology. Referred to Molecular Diagnostic Laboratory, St. James Hospital. Samples should be received into laboratory before 11.30 for same day dispatch.
APTT	Blood	Sodium Citrate Light Blue Cap 3 mls	Urgent 1.5hrs Routine 4hrs GP 2 working days	See report	Haematology*	One sample sufficient for PT, INR, APTT, APTT Ratio, D-Dimers and Fibrinogen. Sample Stability: 4 hrs post collection.
APTT Ratio	Blood	Sodium Citrate Light Blue Cap 3 mls	Urgent 1hr Routine 4hrs GP 2 working days	See report	Haematology*	Used for heparin monitoring.

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Arbovirus serology (Include travel history)	Blood	Serum Gold Cap 5mls	Only tested by specific arrangement	N/A	Microbiology Dispatch	Referred to National Virus Ref. Laboratory University College Dublin.
Arterial Blood Gases	Arterial Blood	Pre-heparinised blood gas syringe - 2mL	15 min	pH = 7.35 - 7.45, $pCO_{2\,(male)}$ 4.6 - 6.4 kPa, $pCO_{2\,(female)}$ 4.3 - 6.0 kPa, pO_2 <60y 11.0-14.4 kPa, pO_2 >60y 11.0-14.4 kPa Actual Bicarbonate 21-28 mmol/L Base Excess - 2 to + 3 , $\%O_2$ Sat 94 - 98%	Clinical Chemistry	After taking sample, ensure no air bubbles are present. Bring to the lab immediately. ABG specimen should not be sent via the POD system. The pO_2 reference range refers to patients on room air. For patients on oxygen therapy, a pO_2 of 8 kPa is generally taken as a minimum target.
Ascitic Fluid for Microbiology See Fluids Section						
Ascitic Fluid for tumour	20ml fresh sample	Universal / 20mls	5 days		Cytology	Large volume of fluid received in drain bags not suitable.
AST (Aspartate Aminotransferase)	Blood	Serum Gold Cap 5mL	4 hours	11 – 34 U/L	Clinical Chemistry	For Patients on Sulfasalazine and/or Sulfapyridine please collect blood samples before the dose is given or 7-8 hours post dose to minimise analytical interference
Aspergillus Ab	Blood	Serum Gold Cap 5mls	15 days	See Report	Microbiology Dispatch	Referred to Eurofins Biomnis
Aspergillus Antigen (Galactomannam)	Blood	Serum Gold Cap 5mls	15 days Positive results phoned to Microbiology registrars	See Report	Microbiology Dispatch	Referred to Eurofins Biomnis
Atypical Pneumonia Screen – see individual entries for Chlamydia and Mycoplasma.						
Autopsies /Post Mortems				Histology	See section 22 above	

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Avian Abs	Blood	Serum/ 5-10ml	10 days	N/A	Microbiology Dispatch	Referred to Royal Brompton Hospital, U.K.G154.
Babesia Abs	Blood	Serum Gold Cap 5mls	21 days	See Report	Microbiology Dispatch	Referred to Hospital for Tropical Diseases London.
Bacillus anthracis Ab	Blood	Serum Gold Cap 5mls	16 days	See Report	Microbiology Dispatch	Referred to PHE Porton Down, Rare and Imported Pathogens Laboratory
Bartonella Abs	Blood	Serum/ 5-10ml	6 days	See Report	Microbiology Dispatch	Referred to Eurofins Biomnis.
BCR-ABL [Molecular Marker]	Bone Marrow or Blood	Bone Marrow in **RPMI (24hrs old) or Lavender EDTA 3ml x 2	28 days	See Report	Haematology Referred	Useful in CML. ** Containers available from Haematology. Referred to Molecular Diagnostic Lab, St. James's Hospital. Samples must be received into lab before 11.30 for same day dispatch.
Bence-Jones Protein - See Protein Electrophoresis (urine)						
Beta D Glucan	Blood	Serum Gold Cap 5mls	14 days	See Report	Microbiology Dispatch	Referred to PHE Bristol,Mycology Reference Laboratory
B2M (Beta 2 Microglobulin)	Blood	Serum Gold Cap 5mL	7 days	0.8 - 2.2 mg/L	Clinical Chemistry	
Bicarbonate - see Arterial Blood Gases						
Biliary Brushings	In Cytolyt*	10mls Cytolyt container (available from Cytology)	5 days		Cytology	* Cytolyt available from Cytology.
Bile Duct Brushings for tumour	Brushings from common bile duct	10mls Cytolyt container (available from Cytology)	5 days		Cytology	Please specify if Endoscopic or Percutaneous sample.
Bile for C/S	Bile	Sterile Universal container 5-20ml	48-96h	N/A	Microbiology	
Bile Acid (Total)	Blood	1 mL Refrigerated Serum	5 days	<6.0 umol/L	Clinical Chemistry	Dispatched to Eurofins , Ideally Patient should be fasting for 8h prior to sample collection.

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Conjugated Bilirubin (Direct)	Blood	Serum Gold Cap 5mL	Daily (Mon-Fri)	0-5 umol/L	Clinical Chemistry	Direct (Conjugated) Bilirubin measurement is occasionally required but is not warranted if Total Bilirubin is < 35 umol/L. Protect specimens from light.
Total Bilirubin	Blood	Serum Gold Cap 5mL	4 hours	0- 21 umol/L	Clinical Chemistry	For analyte stability, care should be taken to prevent exposure to light. Raised immunoglobulins may cause a spurious elevation in the total bilirubin concentration. Please interpret with caution.
Bio banking	Various tissue types (dry)	Dry Specimen			Histology	Bring Tissue to Histology Laboratory and give to staff member immediately or send in the dumb waiter. Please phone laboratory prior to sending sample in the dumb waiter (Ext 4350).
Biopsy • Urgent (also see Liver Biopsy) • Breast (Symptomatic & Breast Check) - Prostate - Lung - Routine	Various tissue types	10% Formalin	5 days 5 days 7 days 5 days 15 days		Histology	Histology tissue (routine) must be fixed (in 10% formalin) immediately in containers of adequate size. The volume of fixative should be at least ten times the volume of the tissue. Please phone laboratory prior to sending urgent biopsy (Ext. 4350). **NOTE:** Friable/tiny tissue fragments may not survive processing. Please indicate on request form if tissue sent is friable/tiny.
BK Polyomavirus PCR	Blood, urine	Serum Gold Cap 5mls EDTA Lavender Cap. 3 mls Urine Sterile universal container	9 days	N/A	Microbiology Dispatch	Referred to National Virus Ref. Laboratory University College Dublin.
Blood Culture	Blood	B/C Bottles 8-10 ml Please send aerobic and anaerobic bottles	Neg cultures reported after 5 days. Pos cultures notified to team when available.	N/A	Microbiology	Use Yellow Microbiology Request Form. All positive results are phoned to the team/ clinician when confirmed. **Please do NOT remove or cover barcodes on bottles.**
Blood Films	Blood	EDTA Lavender Cap. 3 mls	Urgent Verbal Result 2hrs; Routine Same Day = 8hrs; GP / OPD 48hours	See Report Comments	Haematology	Blood films are made from FBC sample. Sample stability = 12hrs post collection.
BNP (proBNP) see NT-proBNP	Blood	Serum Gold Cap 5mL	Daily (Mon-Fri)	See Report	Clinical Chemistry	see NT-proBNP

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Blood Group and Antibody Screen*	Blood	EDTA Pink Cap 6mls	3 hrs*		Blood Bank	*excluding patients with RBC antibodies.
Bone Alkaline Phosphatase	Blood	Serum Gold Cap 5mL	4-6 Weeks	Female: 2.9 -14.5 ug/L, Male: 3.7 - 20.9 ug/L	Clinical Chemistry	Bone Specific Alkaline Phosphatase assay exhibits up to 15% cross reactivity with Liver Alkaline Phosphatase
Bone Biomarker Profile: - Ionised Calcium - PTH - 25(OH)D - P1NP (Procollagen Type 1 N-Propeptide) - Osteocalcin (OCI) - Bone Alkaline Phosphatase (BAP) - CTX-1 (C-Terminal cross-linking Telopeptide of type 1 Collagen)	Blood	Serum Gold Cap 5mL	4 Weeks	See individual tests	Clinical Chemistry	Fasting Blood to be obtained before 10.30 AM required. Bone Marker Protocol available from Lab. Results affected by: Fasting, Circadian Variation. P1NP, CTX-1, Osteocalcin: Biotin may cause some concentration dependent negative interference in this assay if high dose supplements are taken. If this is suspected, a repeat request 8 plus hours off Biotin is recommended in the first instance. Please contact the Duty Scientist on Ext 3127 for further details.
Bone Biomarker Profile: Calcium/Creatinine Ratio	Urine	2 hour timed urine or 2nd morning void, Specimen container available in Lab.	4-6 weeks	See individual tests	Clinical Chemistry	Timed Urine collection to be obtained before 10.30 AM required. Bone Marker Protocol available from Lab. Results affected by: Fasting, Circadian Variation.
Bone Marrow Aspirate	Marrow	Glass Slides, **Heparinised RPMI (Immunophenotyping) [SVUH] and Cytogenetics [Crumlin])	Approx 10 days	See report interpretive comments	Haematology	Provisional results available within 48 hrs - discussed at weekly MDT meeting. ** Containers are available from the Haematology laboratory.
Bone Marrow Biopsy	Bone Marrow Trephine	10% Formalin	15 days		Histology	Turnaround time may be longer if decalcification is required
Bordetella pertussis culture / PCR (whooping cough)	Perinasal swab	Special swab required – refer to laboratory	21 days	N/A	Microbiology Dispatch	Referred to Microbiology Department, OLCH, Crumlin

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Bordetella pertussis Abs (whooping cough) -not suitable for immune status	Blood	Serum Gold Cap 5mls	21 days	See Report	Microbiology Dispatch	Referred to Microbiology Department, OLCH, Crumlin
Borrelia burgdoreri Abs (Lyme disease)	Blood CSF	Serum Gold Cap 5mls CSF-min 500ul(with paired serum taken within 24hrs only)	9 days – longer for confirmation	See Report	Microbiology Dispatch	Referred to National Virus Ref. Laboratory University College Dublin.
Breast Sentinel Node tumour detection	Breast axillary nodes	10% Formalin Labelled 'Radioactive'	10 days		Histology	Histology tissues (routine) must be fixed (in 10% formalin) immediately in containers of adequate size. The volume of fixative should be at least ten times the volume of the tissue. Pots must be labelled as Radioactive.
Bronchial Brushings for tumour	Bronchial brushings	In Cytolyt- available from Cytology)	5 days		Cytology	
Bronchial Brushings for Cilia motility	Bronchial brushings	In EM fixative (Available from Histology lab)	21 days		Histology	Specimen sent to University Hospital Southampton for EM studies. Please inform histology lab (Ext.4613) in advance as specimen requires particular EM fixative.
Bronchial Washings for Microbiology C/S, TB, Mycology (BAL)	Fresh specimen	Sterile Universal Container	7 days- 10 days (culture and sensitivity) See TB for specific details		Microbiology	All BWs and BALs are processed for TB.
Bronchial Washings / BAL for Cytology, Differential	Fresh specimen	Sterile Universal Container	5 days		Cytology	
Bronchial Washings for tumour /Bronchoalveolar Fluid	Fresh sample	Sterile Universal Container	5 days		Cytology	
Brucella Antibody	Blood	Serum/ 5-10ml	8 days screen 11 days confirmation	See Report	Microbiology Dispatch	Referred to Eurofins Biomnis.
C1 Esterase Inhibitor	Blood	Serum Gold Cap 5mls	20 days	210-390 mg/L	Immunology	Specimens Referred to Eurofins Biomnis. Reduced levels are associated with hereditary angioedema
C1 Esterase Inhibitor Function	Blood	Sodium Citrate, Light Blue Cap 5 ml and Serum Gold Cap 3 mls	28 days	Normal function	Immunology	Referred to Eurofins Biomnis. Specimens must be brought directly to laboratory for dispatch to referral laboratory.

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Complement Function CH100 (CH50) AP100	Blood	Serum Gold Cap 5mls	28 days	Normal function	Immunology	Referred to Eurofins Biomnis. Specimens must be brought directly to laboratory and frozen within one hour of collection.
CA 125	Blood	Serum Gold Cap 5mL	Daily (Mon-Fri)	There is no reference interval for male patients. The female reference interval is </=35 kU/L.	Clinical Chemistry	Most useful in ovarian cancer. Tumour marker results of a patient's sample can vary depending on the testing procedure used. Values determined on patient samples by different testing procedures cannot be directly compared with one another and could be the cause of erroneous medical interpretations. It is therefore advised to have this test measured in the same laboratory for the duration of treatment and follow-up. Method used – Roche Immunoassay Tumor marker results can be used as an aid to cancer management but not as a case finding approach or general screen for cancer. Biotin may cause some concentration dependent negative interference in this assay if high dose supplements are taken. If this is suspected, a repeat request 8 plus hours off Biotin is recommended in the first instance. Please contact the Duty Scientist on Ext 3127 for further details.
CA 15-3	Blood	Serum Gold Cap 5mL	Daily (Mon-Fri)	0 - 40 kU/L	Clinical Chemistry	Most useful in breast cancer. Tumour marker results of a patient's sample can vary depending on the testing procedure used. Values determined on patient samples by different testing procedures cannot be directly compared with one another and could be the cause of erroneous medical interpretations. It is therefore advised to have this test measured in the same laboratory for the duration of treatment and follow-up. Method used – Roche Immunoassay Tumor marker results can be used as an aid to cancer management but not as a case finding approach or general screen for cancer. Biotin may cause some concentration dependent negative interference in this assay if high dose supplements are taken. If this is suspected, a repeat request 8 plus hours off Biotin is recommended in the first instance. Please contact the Duty Scientist on Ext 3127 for further details.
CA 19-9	Blood	Serum Gold Cap 5mL	Daily (Mon-Fri)	0 - 37 kU/L	Clinical Chemistry	Most useful in pancreatic cancer. Tumour marker results of a patient's sample can vary depending on the testing procedure used. Values determined on patient samples by different testing procedures cannot be directly compared with one another and could be the cause of erroneous medical interpretations. It is therefore advised to have this test measured in the same laboratory for the duration of treatment and follow-up.

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
						Method used – Roche Immunoassay. Tumor marker results can be used as an aid to cancer management but not as a case finding approach or general screen for cancer. Biotin may cause some concentration dependent negative interference in this assay if high dose supplements are taken. If this is suspected, a repeat request 8 plus hours off Biotin is recommended in the first instance. Please contact the Duty Scientist on Ext 3127 for further details,
Carbohydrate deficient Transferrin	Blood	2 Serum Red Capped	4 weeks	See Report	Clinical Chemistry Dispatch	Referred to: Dr Joanne Marsden, Kings College Hospital, Demark Hill, London SE5 9RS. One serum sample to referred, the other sample is kept frozen.
cAMP	Urine - 24hr collection	25 ml aliquot from a 24 hrs collection	10 days	See Report	Clinical Chemistry Dispatch	Referred to Eurofins Biomnis.
Caeruloplasmin	Blood	Serum Gold Cap 5mL	1-3 days	0.15-0.30 g/L (M) 0.16-0.45 g/L (F)	Clinical Chemistry	
Urine Calcium (Urine Calcium Excretion)	Urine	24 h urine bottle (plastic) - no preservatives required OR spot urine OR 2h timed urine	Same day if received before 11am.	2.5 - 7.5 mmol/24h	Clinical Chemistry	Urine collection bottle and request form must be clearly labelled with patient name and hospital number. The date and time of the start and finish of the collection must be clearly indicated. Urinary volumes are reported in Litres. Urine creatinine is added to all urine calcium requests automatically by IT rule. The calcium/creatinine ratio will be reported, see below.
Arterial Ionised Calcium Venous Ionised Calcium	Blood Venous Blood gas sample	Serum Gold Cap 5mL/ Arterial blood gas sample VBG	Daily	1.15 - 1.33 mmol/L 1.16-1.32 mmol/L	Clinical Chemistry	Samples must be received on day of collection. SVPH Endocrinologist by Special arrangement if clinically required: Please always send a separate sample for Calcium-Ionised.
Calcium	Blood	Serum Gold Cap 5mL	4 hours	2.20 - 2.60 mmol/L	Clinical Chemistry	Avoid venostasis as it may cause inaccurate total calcium measurement.

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Adjusted Calcium	Blood	Serum Gold Cap 5mL	4 hours	2.2-2.60 mmol/L	Clinical Chemistry	The adjusted calcium calculation has been derived in-house and is based on SVUH methodologies for calcium and albumin. The calculation has been validated for use and is automatically calculated in adult patients with calcium requested and an albumin concentration between 20 and 47 g/L. Adjusted calcium >3.5 mmol/L with no PTH result within the previous 365 days will have a PTH test added on automatically by IT rule. Avoid venostasis as it may cause inaccurate total calcium measurement.
Calcium/Creatinine Ratio (UCa/Creatinine Ratio)	Urine	24h urine, spot urine, 2h timed urine or 2nd morning void.*	4 weeks	0.07 - 0.41	Clinical Chemistry	Part of Bone Biomarker Protocol available from the laboratory. *Specimen container available from the lab.
Calcitonin	Blood	Serum – separate and freeze within 4 hours.	2 weeks	<10 ng/l females <15 ng/l males	Clinical Chemistry Dispatch	Serum must be frozen within 4 hours of collection Referred to Eurofins Biomnis.
Calprotectin	Fresh Stool Sample or freeze at -20	Yellow top wide rimmed universal container	1 week		Clinical Chemistry Dispatch	Referred to Mater Hospital >18 years. Referred to Eurofins Biomnis <18 years. Note*If Faecal Elastase is required a separate stool sample is required*
Cancer Resections	Various tissue types	Dry for biobank, 10% formalin for routine histopathology Please use suitable sized container.	10 days		Histology	Dry specimens - Bring Tissue to Histology Laboratory and give to staff member immediately or send in the dumb waiter. Please phone laboratory prior to sending sample in the dumb waiter (Ext 4350). Please remember to place tissue in adequate volume of 10% Formalin. The volume of fixative should be at least ten times the volume of the tissue.
Cannabis, Amphetamines, Methadone, L.S.D	Blood	Spot Urine	10 days	N/A	Clinical Chemistry Dispatch	Referred to Outside Laboratory (National Drug Centre Pearse Street). Specimens must be received into laboratory before 12.00 .
Candida Abs	Blood	Serum Gold Cap 5mls	14 days	See Report	Microbiology Dispatch	Referred to PHE Bristol, Mycology Reference Laboratory
Carbamazapine (Tegretol)	Blood	Serum Gold Cap 5mL	Daily	4 - 12 mg/L (Monotherapy), 4 - 8 mg/L (if polypharmacy is	Clinical Chemistry	Metabolism of Carbamazapine may be increased by Phenytoin and Phenobarbitone and is decreased in liver dysfunction. The therapeutic range for carbamazepine is derived from the relationships between plasma level, seizure control and emergence of

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
				present). In combination therapy, the suggested therapeutic range for carbamazepine is lower: 4 - 8 mg/L.		side effects. Blood levels vary depending on sex, race and age. Lower concentrations may provide effective therapeutic response when other anticonvulsants are used in combination with carbamazepine. Samples must be analysed within 24 hours of collection.
Total CO2 (Carbon Dioxide)	Blood	Serum Gold Cap 5mL	4 hours	22-29 mmol/L	Clinical Chemistry	Avoid small samples. Not routinely available for GPs due to sample stability issues. Add on testing not available due to sample ability issues.
Carboxyhaemogloblin (See also Methemoglobin)	Blood	Pre-heparinised blood gas syringe - 2mL Venous Blood	15 min	0.0-3.0 % Non-Smokers	Clinical Chemistry	Please ensure that there are no air bubbles present. Bring to laboratory immediately. See note on smoking. Carboxyhaemogloblin can be measured on LiHep samples at the request of a GP – please contact laboratory
Catecholamines Not available See note opposite	Urine - 24h collection	24h urine collection - acid containing bottle obtainable from Clinical Chemistry Laboratory *	NA	See Report	Clinical Chemistry Dispatch	Requests for Urinary Catecholamines will have Urinary Metanephrines measured instead as they are more specific and sensitive. Please see details for Metanephrines.
CD20/CD19 See Lymphocyte subsets	Blood	EDTA Lavender Cap 3 ml	6 hours	See Report	Immunology	Used to monitor the effects of Rituximab. Samples sent to St James's Immunology Dept
CD34 Post Thaw viability	Blood Stem Cells	EDTA Lavender Cap 3 ml Cryovial 2ml	3 hours 3 hours	See Report	Haematology	Assayed pre peripheral blood stem cell processing. Sample stability = 12hrs post collection Assayed pre-reinfusion of stem cell harvest. Prior arrangement between Tissue establishment and Immunophenotyping required. Sample stability = 3 hrs post collection
CD4 /CD8 T cells See Lymphocyte subsets						
CEA	Blood	Serum Gold Cap 5mL	Daily (Mon-Fri)	0 - 3.5 ug/L	Clinical Chemistry	Most useful in colorectal cancer. Tumour marker results of a patient's sample can vary depending on the testing procedure used. Values determined on patient samples by different testing procedures cannot be directly compared with one another and could be the cause of erroneous medical interpretations. It is therefore advised to have this test measured in the same laboratory for the duration of treatment and follow-up. Method used – Roche Immunoassay

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Chikungunya Abs	Blood	Serum Gold Cap 5mls	Only tested by specific arrangement	N/A	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin.
Chikungunya PCR	Blood	EDTA Lavender Cap 3 ml	Only tested by specific arrangement	N/A	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin.
Chloride	Blood	Serum Gold Cap 5mL	4 hours	95 - 108 mmol/L	Clinical Chemistry	Part of Urea and Electrolytes Profile.
Urine Chloride Excretion	Urine - 24h collection	24h urine bottle (plastic) - no preservatives required	Mon - Fri Same day if received before 11am	20 - 125 mmol/24h	Clinical Chemistry	Urine collection bottle and request form must be clearly labelled with patient name and hospital number. The date and time of the start and finish of the 24h collection must be clearly indicated. Urine creatinine is added to all urine chloride requests automatically by IT rule. Urinary volumes are reported in Litres.
Urine Chloride	Urine - Fresh spot	Sterile Universal Container - 5mL (min)	4 hours		Clinical Chemistry	Urine creatinine is added to all urine chloride requests automatically by IT rule. Urine chloride requests will also have sodium and potassium measured automatically by IT rule.
Cholesterol (Please also see Lipid Profile)	Blood	Serum Gold Cap 5mL	4 hours	N/A	Clinical Chemistry	N.B - Label specimen container and form fasting (F) if patient is fasting. Target cholesterol value following lifestyle advice or drug therapy is <5.0 mmol/L. Venepuncture should be performed prior to the administration of Metamizole as metabolites may cause interference with analysis. For lipid interpretation please see ESC/EAS guidelines for the management of dyslipidaemias. European Heart Journal (2019) doi.org/10.093/eurheartj/ehz455 "There are a number of well validated cardiovascular disease risk assessment systems available that are recommended as part of different guidelines. The 2019 European Guidelines on cardiovascular disease prevention in clinical practice provide a list of commonly used tools and the authorities recommending them. There is no consensus recommendation on which of these systems should be used, but it is agreed that these tools can enhance clinical decision making in the primary prevention of cardiovascular disease."
Cholinesterase (Pseudocholinesterase, Cholinesterase II)	Blood	Serum Red Cap 5 mL	6 days Only tested by prior arrangement	Male 5,320 – 12,920 U/L	Clinical Chemistry Despatch	Referred to Clinical Chemistry Laboratory, St James Hospital, Dublin.

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
				Female Age 16-39 (Not pregnant and not using hormonal contraceptives) 4,260-11,250 U/L Age 18-41 (Pregnant or taking oral contraceptives) 3,650 – 9,120 U/L Age > 40 5,320 – 12,920 U/L		
Chromogranin A	Blood	EDTA Plasma	6 days	<108 ng/mL		Plasma must be placed ON ICE and brought to the lab immediately. Samples currently dispatched to **Eurofins.** Patient should be Fasting.
Chromium	Blood	Serum or heparin Plasma 1ml Urine sample 10ml	2 weeks	See Report	Clinical Chemistry Dispatch	Specimen referred to Eurofins Biomnis.
Chlamydia pneumoniae Abs	Blood	Serum Gold Cap 5mls	8 days	See Report	Microbiology Dispatch	Referred to external Lab (Eurofins Biomnis).
Chlamydia psittaci Abs	Blood	Serum Gold Cap 5mls	8 days	See Report	Microbiology Dispatch	Referred to external Lab (Eurofins Biomnis).
Chlamydia trachomatis PCR	Swab Urine	Specific Aptima collection devices required.	7 days	N/A	Microbiology Dispatch	If Chlamydia trachomatis, *N. gonorrhoeae* or *Trichomonas vaginalis* is suspected please contact the NVRL (external patients) or Microbiology department (in-patients) for Aptima collection devices. These samples are referred to National Virus Reference Laboratory University College Dublin.
Chloramphenicol levels	Blood	Serum Gold Cap 5mls	Phoned same day if received before 3pm Mon-Fri	See Report	Microbiology Dispatch	Referred to PHE Bristol, Antimicrobial Reference Laboratory
Choroidal FNA	Fluid	Syringe fresh or with Cytolyte	5 days		Cytology	Sent to Histology laboratory from Royal Victoria Eye and Ear Hospital, Dublin

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Ciprofloxacin levels	Blood	Serum Gold Cap 5mls	Phoned same day if received before 3pm Mon-Fri	See Report	Microbiology Dispatch	Referred to PHE Bristol, Antimicrobial Reference Laboratory,
Citrate	Urine	24 hour urine bottle - no additive	20 days	290-881 mg/24h	Clinical Chemistry Dispatch	Part of stone screen. The date and time of start and finish of collection must be clearly indicated.
CMV Abs	Blood	Serum red/gold cap 5mls	7 days	See Report	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin.
CMV PCR	Blood CSF BAL	EDTA 3mls Sterile Universal container	6 days blood/CSF 9 days BAL	See Report	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin. If sending other tests, send a separate EDTA sample for CMV PCR.
Coagulation Screen [PT, INR, APTT]	Blood	Sodium Citrate Light Blue Cap 3 mls	Urgent 1.5 hrs Routine 4hrs GP 2 working days	See Report	Haematology*	Correct volume of blood is essential. One sample sufficient for PT, INR, APTT, APTT Ratio, D-Dimers, Fibrinogen. Sample stability – see information on individual tests.
Cobalt	Blood	EDTA trace element tube (Navy top with blue band on tube) Serum or heparin plasma 1ml.	2 weeks	See Report	Clinical Chemistry Dispatch	Specimens referred to Eurofins Biomnis.
Cold agglutinin	Blood	EDTA Lavender Cap 6 ml x 2	14 days	See Report	Immunology	Samples sent to Irish Blood Transfusion Service, St. James's Hospital. BT345 request form must accompany samples- available to print on the website: https://healthprofessionals.giveblood.ie/clinical-services/transfusion-transplantation/red-cell-immunohaematology-diagnostics/rci-test-request-forms/
Colistin (Colomycin)	Blood	Serum Gold Cap 5mls	Phoned same day if received before 3pm Mon-Fri	See Report	Microbiology Dispatch	Referred to PHE Antimicrobial Reference Laboratory, Bristol
Complement C3 Complement C4	Blood	Serum Gold Cap 5mL	1-3 days	C3: 0.90 - 1.80 g/L C4: 0.14 - 0.54 g/L	Clinical Chemistry	If either or both are requested CRP is added automatically by IT rule.

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Conjunctiva Bx (for DIF)	Tissue	Universal container (specimen must be wrapped in saline moistened gauze)	15 days		Histology	Lab must be notified beforehand (Ext: 4350) Specimen needs to be transported ASAP to lab.
Copper (Serum)	Blood	Serum Trace Element Tube - navy top with red stripe on tube, or 2mL serum. Spun immediately and refrigerated.	1 week	See Report	Clinical Chemistry Dispatch	Specimens referred to Eurofins Biomnis.
Copper (Urine)	Urine - 24h collection	24 h urine bottle (plastic). No preservatives required.	1 week	See Report	Clinical Chemistry Dispatch	20 mls of 24hr Urine collection dispatched to Eurofins Biomnis.
Cortisol	Blood	Serum Gold Cap 5mL	Daily (Mon-Fri)	See Report	Clinical Chemistry	State time of sample collection on request form. Stress may elevate levels. Biotin may cause some concentration dependent positive interference in this assay if high dose supplements are taken. If this is suspected, a repeat request 8 plus hours off Biotin is recommended in the first instance. Please contact the Duty Scientist on Ext 3127 for further details.
Cortisol (Urinary free)	Urine - 24h collection	No preservatives required	7 days (referred to external laboratory)	See Report	Clinical Chemistry Dispatch	Urine collection bottle and request form must be clearly labelled with patient name and hospital number. The date and time of the start and finish of the 24 hr collection must be clearly indicated. Urinary volumes are reported in Litres.
Covid-19 (SARS-CoV-2)	Nasopharyngeal/ deep throat swab	Liquid Viral Swab eNAT swab (blue top) 2ml	Rapid test: 12 hrs Batch test: 24 hrs		Microbiology	Nasopharyngeal swab collected into eNAT container (blue top). Red top swab containers with liquid viral UTM may still be used if there is a shortage of eNAT swabs. All viral swabs are available from microbiology laboratory. Tests will only be performed between 08.00 and 19.20 Mon-Fri, and between 09.30 and 12.00 Sat and Sun.
Coxiella burnetti antibody (Q Fever) (not indicated for atypical pneumonia screen)	Blood	Serum/ 5-10ml	6 days	N/A	Microbiology Dispatch	Referred to Eurofins Biomnis if deemed appropriate by Clinical Microbiology team
C-Peptide	Blood	1mL Serum or EDTA plasma or Heparin plasma frozen <4h	4 weeks	0.2 - 3.2 ug/L	Clinical Chemistry Dispatch	Referred to Outside Laboratory (Eurofins Biomnis). Specimens must be received into laboratory before 12.00 for same day dispatch.

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
CPE Screen	Rectal swab	Bacterial Transport swab	96h	N/A	Microbiology	
CK (Creatine Kinase)	Blood	Serum Gold Cap 5mL	4 hours	Male: 40-320 U/L Female: 25-200U/L	Clinical Chemistry	Total CK may be elevated following IM injection.
Creatinine (Enzymatic)	Blood	Serum Gold Cap 5mL	4 hours	Male: 59 – 104 umol/L Female: 45 - 84 umol/L	Clinical Chemistry	Part of Urea and Electrolytes Profile. Venepuncture should be performed prior to the administration of Metamizole as metabolites may cause interference with analysis.
Urine Creatinine (Enzymatic)	Urine	Spot urine 24h Urine bottle (plastic) - no preservatives required	Daily (Mon-Fri)	Early morning Urine Male 3.5-24.6 mmol/L Female 2.6-20.0 mmol/L UCRE 24 hr: Female 6-13 mmol/24h Male 9-19 mmol/24h	Clinical Chemistry	Urinary volumes are reported in Litres.
Urine Creatinine Excretion	Urine - 24h collection / Blood	24h Urine bottle - no preservatives required Blood: Serum gold topped tube - 4.5 mL	Daily (Mon-Fri)	Creatinine Clearance 66-143mL/min.	Clinical Chemistry	Clearance studies such as creatinine clearance should only be done when the patient is stable as otherwise the results will not be clinically representative. On this basis, we will utilise the serum sample plus/ minus 3 days on either side of the urine collection. Blood specimen for creatinine must be taken during or within 24 hours of urine collection. Urine collection bottle and request form must be clearly labelled with patient name and hospital number. The date and time of the start and finish of the collection must be clearly indicated. Urinary volumes are reported in Litres.
2hr Creatinine Clearance (Urine)	Urine	2 hour urine collection	4 hours		Clinical Chemistry	Urinary volumes are reported in Litres.
Crossmatch*	Blood	EDTA Pink Cap 6mls	3 hrs*		Blood Bank	*excluding patients with RBC antibodies.
C Reactive Protein (CRP)	Blood	Serum Gold Cap 5mL	4 hours	0- 5.0 mg/L	Clinical Chemistry	CRP rises rapidly after onset of an acute phase response, beginning within 6 – 12h and peaking within 24 – 48h. The CRP response may be less pronounced in liver disease.
hsCRP (High Sensitivity CRP)					Clinical Chemistry	The above assay (i.e. CRP) has a functional sensitivity of 0.6 mg/L and therefore may suffice for hsCRP but the manufacturer does not promote the use of the assay for cardiovascular risk stratification.

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Cryoglobulins Cryoproteins include cryoglobulin or cryofibrinogen	Blood	3 x Serum Gold Cap 2 x EDTA tubes.	10 days	Negative	Immunology	Cryoglobulins are found in patients with lymphoproliferative disorders, vasculitis, connective tissue disease and chronic infection especially hepatitis C. It is extremely important that the blood is collected and transported to the laboratory at 37º C. A portable incubator is available in the Phlebotomy Dept on the ground floor for this purpose. Collection of samples for detection of cryoglobulin or cryofibrinogen is restricted from Monday to Thursday. Samples should reach laboratory by 2pm. **SMH** - not suitable to be taken in SMH as there is no transport option available for transport at 37º C to SVUH. Sample must be taken in SVUH.
Cryptococcal Ag	Blood or CSF	Serum 5-10mls or CSF (see relevant CSF section)	Daily on request	N/A	Microbiology	Please ensure sample is in the laboratory before 12.00 Mon-Fri. Only on discussion with Clinical Microbiologist.
CSF Cell Counts & Culture	CSF	As much as possible into 3 Sterile universal containers. Please number each container sequentially.	Cell counts: 1hr Culture: kept for 48hrs-10 days	WCC: 0-5 per cmm RCC: 0-9 per cmm	Microbiology	All samples should be brought to microbiology laboratory immediately and handed to scientific staff. Outside of routine hours please hand into the Haematology scientist on-call. All positive results are phoned to the team/ clinician when confirmed. Use Yellow microbiology form. PLEASE STATE TIME OF CSF COLLECTION ON REQUEST FORM. CSF samples must not be sent in the pod system.
CSF – CJD Protein 14-3-3	CSF	2-5mls	28 days	See Report	Microbiology Dispatch	Referred to Beaumont Hospital Please contact Clinical Microbiologist before taking samples. Sample must be frozen within 30 minutes of collection. Ideally these samples should be collected during routine hours. PLEASE STATE TIME OF CSF COLLECTION ON REQUEST FORM. CSF samples must not be sent in the pod system.
CSF ACE (Angiotensin Converting Enzyme)	CSF	0.5 mL of CSF in plain plastic container	1 day		Clinical Chemistry Dispatch	Please supply CSF Total Protein Result. Specimen should be frozen ASAP. Refrigerated samples accepted if noted on request form. Referred to Neurometabolic Unit Box 105, National Hospital for Neurology, Queen St, London WCIN 3BG (Dr J.M.Land). CSF volumes required are stated per test, if more than one test is required more volume will be required.
CSF for malignancy	Fresh sample > 4ml if possible	Sterile Universal Container	5 days		Cytology	CSF specimens should be brought to Microbiology Laboratory. CSF samples must not be sent in the pod system.

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
CSF Glucose	CSF	Fluoride Oxalate tube Grey Cap - 0.3mL (min)	2 hours	CSF Glucose: ≥2/3 of plasma Glucose value	Clinical Chemistry	Bring to microbiology laboratory immediately and Micro staff will forwarded to Clinical Chemistry. It is essential that the time of collection of CSF specimen is recorded on the request form. Blood for plasma glucose should be taken at the same time. Please Note: Fluoride Oxalate specimen is not suitable for CSF Protein analysis. CSF samples must not be sent in the pneumatic tube system. CSF volumes required are stated per test, if more than one test is required more volume will be required.
CSF Lactate	CSF	CSF specimen must be taken into a fluoride oxalate tube.	5 days	See Report	Clinical Chemistry Dispatch	Immediately after collection bring aliquot of CSF to Clinical Chemistry for freezing. Specimen must be frozen within 30 minutes. Referred to Temple St. CSF samples must not be sent in the pod system.
CSF Protein	CSF	Sterile Universal Container - 0.3mL (min)	2 hours	0.15 - 0.45 g/L	Clinical Chemistry	Bring to microbiology laboratory immediately. Microbiology staff will forward the specimen to Clinical Chemistry. Please state time of specimen collection on request form. CSF samples must not be sent in the pod system. Haemoglobin in the CSF sample will cause positive interference. CSF volumes required are stated per test, if more than one test is required more volume shall be required.
CSF Xanthachromia (Bilirubin)-Quantitative	CSF	Minimum 1 mL (Protected from light) taken at least 12h post suspected SAH. Also Blood sample for Bilirubin and Total Protein.	2-3 days from receipt in referral lab	See Report	Clinical Chemistry Dispatch	Referred to Synnovis UK: At least 1mL (protected from light immediately) and least blood contaminated. Sample < 1 mL for technical reasons cannot be processed. Do Not use pneumatic tube system for transport. Record timing post suspected SAH; must be at least 12h post event. Results can be followed up by contacting Synnovis directly on 0044 20 4513 7300. Positive results will be phoned to the lab at SVUH who in turn will contact the requesting clinician. Negative results will be phoned the next working day. CSF volumes required are stated per test, if more than one test is required more volume will be required.
CSF neurodegenerative markers: CSF Total Tau CSF A-β-42 CSF A-β-40 CSF A-β-42/ A-β-40 ratio	CSF	CSF (collected into polypropylene container).	35 days	See report	Immunology	Referred to Neuroimmunology & CSF Laboratory, London The Aβ42/Aβ40 ratio is the new 'front-line' screen as a measure of cerebral amyloid deposition and thus AD. It correlates extremely well to PET amyloid deposition and is superior to the Aβ42/total Tau ratio. Total Tau and phospho-tau will need to be requested separately, if required

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CTX-1 (C-Terminal cross-linking Telopeptide of type 1 Collagen)	Serum	Serum Gold Cap 5mL	20 days	Female: 0.150-0.635 ug/L Male: 0.225-0.936 ug/L	Clinical Chemistry	Fasting AM specimen required. Part of Bone Biomarker. Protocol available from Lab. Results affected by: Fasting, Circadian Variation. Biotin may cause some concentration dependent negative interference in this assay if high dose supplements are taken. If this is suspected, a repeat request 8 plus hours off Biotin is recommended in the first instance. Please contact the Duty Scientist on Ext 3127 for further details.
Cyclosporin (Neoral, CYS)	Blood	EDTA / 3mL	5 Day	Patient should be individually monitored.	Immunology	Sensitivity of assay 18 ug/L Take trough sample (i.e. pre-dose). Samples should be stored at 4º C (fridge) overnight.
Cyst Fluid Cytology	Fresh Sample	Universal/ as much as possible	5 days		Cytology	
Cysteine (quantitative test)	Blood / Urine	Heparin Plasma frozen within 1h or early am Urine (10mL) frozen within 1h	10 days	Adults: 10 - 22 umol/mmol creatinine	Clinical Chemistry Dispatch	Referred to Outside Laboratory (Eurofins Biomnis). Specimens must be received into laboratory before 12.00 for same day dispatch.
Cysticerca Abs (Tapeworm, Taenia)	Blood	Serum Gold Cap 5mL	21 days	See Report	Microbiology Dispatch	Referred to Hospital for Tropical Diseases, London
Cytotoxic Antibodies	Blood	Clotted Serum	5 days	See Report	Clinical Chemistry Dispatch	Referred to Beaumont Hospital. Samples must be received into laboratory before 12:00 for same day dispatch.
Cytogenetics for Haematology Disorders	Bone Marrow/ Blood	Bone Marrow in ** Heparinised RPMI or EDTA x 2	10 days	See Report	Haematology Referred	** Containers available from Haematology Dept. Referred to Cytogenetics MLL (Munich), prev sen to Lab Crumlin. Clinical details essential. Monday to Friday samples for National / International dispatch MUST be down in the lab by 11:30 for same day referral. **Exception** is INTERNATIONAL referrals, the last day/time for guaranteed delivery is THURSDAY 11.30AM. Friday 11:30 AM for referral to Munich (MLL) ONLY. Please notify reception referral staff in advance so the Eurofins couriers can be advised.
D-Dimers	Blood	Sodium Citrate Light Blue Cap 3ml	Urgent 1.5hrs Routine 4hrs GP: 2 working days	0 - 0.5 FEU µg/ml	Haematology	Sample stability = 8 hrs post collection.

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Daptomycin levels	Blood	Serum Gold Cap 5mls	Phoned same day if received before 3pm Mon-Fri	See Report	Microbiology Dispatch	Referred to PHE Bristol, Antimicrobial Reference Laboratory
Dengue Fever Abs	Blood	Serum Gold Cap 5mls	Only tested by specific arrangement	See Report	Microbiology Dispatch	Referred to National Virus Ref. Laboratory University College Dublin.
DHEA Sulphate (DHEAS / Dehydroepiandrosterone Sulphate)	Blood	Serum Gold Cap 5mL	Daily	Reference intervals are not provided in those <16 years old. Females: 16-19y: 1.8 - 10.0 umol/L 20-24y: 4.0 - 11.0 umol/L 25-34y: 2.7 - 9.2 umol/L 35-44y: 1.7 - 9.2 umol/L 45-54y: 1.0 - 7.0 umol/L 55-64y: 0.5 - 5.6 umol/L 65-74y: 0.3 - 6.7 umol/L >75y: 0.3 - 4.2 umol/L Males: 16-19y: 1.9 - 13.4 umol/L 20-24y: 5.7 - 13.4 umol/L 25-34y: 4.3 - 12.2 umol/L 35-44y: 2.4 - 11.6 umol/L 45-54y: 1.2 - 9.0 umol/L 55-64y : 1.4 - 8.0 umol/L 65-74y: 0.9 - 6.8 umol/L >75y: 0.4 - 3.3 umol/L	Clinical Chemistry	Indicate age and gender. Biotin may cause some concentration dependent positive interference in this assay if high dose supplements are taken. If this is suspected, a repeat request 8 plus hours off Biotin is recommended in the first instance. Please contact the Duty Scientist on Ext 3127 for further details.
Digoxin	Blood	Serum Gold Cap 5mL	Daily	0.6 – 2.0 ug/L 0.6 – 1.2 ug/L in patients with heart	Clinical Chemistry	Routine monitoring of serum digoxin concentrations is not recommended. A digoxin concentration measured at least 8 hours after the last dose may be useful to confirm a clinical impression of toxicity or

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
				failure		non-adherence. The serum digoxin concentration should be interpreted in the clinical context as toxicity may occur even when the concentration is within the 'therapeutic range'. Samples must be analysed within 24 hours of collection. Biotin may cause some concentration dependent positive interference in this assay if high dose supplements are taken. If this is suspected, a repeat request 8 plus hours off Biotin is recommended in the first instance. Please contact the Duty Scientist on Ext 3127 for further details.
Diphtheria Abs	Blood	Serum Gold Cap 5mL	21d	See Report	Microbiology Dispatch	Referred to PHE Colindale, Bacterial Reference Division: Respiratory and Vaccine Preventable Bacteria Reference Unit (RVPBRU)
Direct Coomb's Test	Blood	EDTA Pink Cap 6mL	3 h		Blood Bank	
Drugs of abuse (DOA): Opiate class, 6-acetylmorphine, benzodiazepine class, 6-ethylidine-1,5-dimethyl-3,3-diphenylpyrrolidine (EDDP), cannabis class, cocaine and amphetamine class	Urine	Universal Container	10 days	N/A	Clinical Chemistry Dispatch	Referred to Outside Laboratory (HSE National Drug Treatment Centre Laboratory Pearse St). **Urine is the only specimen type for send away DOA testing.** Specimens must be received into the laboratory before 12.00 for same day dispatch. No patient should be considered to have taken DOA until they have had screening and confirmatory testing provided by the NDTC. Screen positive test results for Opiates, Cocaine, Amphetamines and Benzodiazepines will automatically have confirmatory testing performed by the NDTC laboratory. In line with best practice urine samples will have creatinine measured. Dilute urine samples may result in a false negative result. The laboratory at SVUH does not provide a DOA service for use in Medico-legal purposes.
Ear swab	Ear Swab	Bacterial Transport Swab	48 - 96 h	N/A	Microbiology	
EBUS (Endoscopic Bronchial Ultrasound)	Air-dried slides + checked stat for adequacy + needle rinse in Cytolyt*	Sent in slide tray	5 days		Cytology	These must be booked with the Cytopathologist. *Cytolyt available from Cytology. Slides must be labelled in pencil with patient's full name and MRN (or DOB).
Electron Microscopy • Amlyloid EM subtyping	Tissue	In EM fixative*	21 days		Histology	Laboratory informed beforehand. *EM fixative obtained from laboratory. Referred to either Beaumont hospital, Leicester Infirmary UK or Biomedical Imaging Unit, Southampton General Hospital (decision on case

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
• Cilia Motiliy • Renal biopsy for EM						by case basis by Consultant Histopathologist).
Electron Microscopy for virus detection	Stool, tissue, vesicle fluid	Sterile Universal container	Only by specific arrangement - largely replaced by molecular methods		Microbiology Dispatch	Referred to National Virus Ref. Laboratory University College Dublin.
Estimated GFR (eGFR / Estimated Glomerular Filtration Rate) Please note: eGFR is calculated using the Chronic Kidney Disease Epidemiology Collaboration creatinine (CKD-EPI) equation)	Blood	Serum Gold Cap 5mL	4 hours	See comments	Clinical Chemistry	1. eGFR is calculated automatically on serum creatinine requests using the CKD-EPI eGFR formulae with enzymatic creatinine assay traceable to ID-MS. The formula used will be different depending on gender and serum creatinine concentration. 2. In line with NICE clinical guidelines, results above 90 ml/min/1.73m^2 are not reported numerically, but are reported as > 90/ml/min/m^2. 3. eGFR is unreliable in acute kidney injury, pregnancy, amputees and Patients aged < 18 yrs. Creatinine Clearance measurement may still be required in pregnancy, muscle wasting disorders, amputations, severe malnutrition, obesity and vegetarian/vegan diet. 4. For CKD classification, see KDIGO 2012 Clinical practice guideline. 5. The eGFR has not been validated for adjusting dosages of potentially toxic drugs *e.g.* Chemotherapy. Use Cockcroft Gault formula or GFR measurement instead. Refer to the Medicines Guide on the SVUH Intranet (internal users only) or the British National Formulary (BNF).
ENT Histology	Various tissue types	10% Neutral buffered formalin container (unless otherwise indicated)	15 days depending on tissue type		Histology	Samples received from RVEE and in house. Specimens requiring special attention please inform the laboratory beforehand (ext. 4350) Please remember to place tissue in adequate volume of 10% Formalin. The volume of fixative should be at least ten times the volume of the tissue.
Enterovirus culture - includes Coxsackie, Echo and Polio viruses	Stool, respiratory secretions	Sterile Universal container	24 days	N/A	Microbiology Dispatch	Referred to National Virus Ref. Laboratory University College Dublin.
EMA binding test for	Blood	EDTA	5 days	N/A	Haematology dispatch	Referred to CHI (Crumlin Haematology Lab)

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Red Cell membrane Studies(instead of Osmotic Fragility test)		lavender cap 3mls @ room temperature				
Enterovirus PCR – includes Coxsackie, Echo and Polio viruses	CSF, blood	Sterile Universal container EDTA Lavender Cap. 3 mls Viral swab (liquid UTM – red top containers only) available from microbiology dept.	6 days	N/A	Microbiology Dispatch	Referred to National Virus Ref. Laboratory University College Dublin. Viral swabs referred to NVRL MUST be collected into liquid UTM (red top tubes). Do NOT use blue top eNAT swabs (used for Covid-19 testing). These will be rejected in NVRL
Enterovirus PCR – includes Coxsackie, Echo and Polio viruses	Stool, throat swab, respiratory secretions, vesicle fluid	Sterile Universal container Viral swab (liquid UTM – red top containers only) available from microbiology dept.	9 days	N/A	Microbiology Dispatch	Referred to National Virus Ref. Laboratory University College Dublin. Viral swabs referred to NVRL MUST be collected into liquid UTM (red top tubes). Do NOT use blue top eNAT swabs (used for Covid-19 testing). These will be rejected in NVRL
Epilim (see Valproic Acid)						
Epstein Barr Virus (EBV) Abs	Blood	Serum/ 5-10ml	7 days	N/A	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin.
Epstein Barr Virus (EBV) PCR	Blood	EDTA Lavender Cap. 3 mls	6 days	See Report	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin. If sending other tests, send a separate EDTA sample for EBV
Erythropoietin	Blood	Serum Gold Cap	8 days	See Report	Haematology Dispatch	Referred to Eurofins Biomnis.
ESR	Blood	EDTA Lavender Cap. 3mls	Urgent – same day GP/Outpatients – 48 hours	Age related reference ranges – please refer to report	Haematology*	One EDTA tube is adequate for FBC and ESR. Minimum Volume 2 mls. Sample stability = 6hrs post collection, 24 hours at 4oC If an ESR is requested with a CRP, only a CRP will be performed, unless relevant clinical details are provided.
Ethanol (Alcohol)	Blood	Blood - Fluoride Oxalate - Grey Cap.	4 hours	N/A	Clinical Chemistry	Results are not for medico-legal purpose.100 mg% ethanol is equivalent to 21.7 mmol/L. Blood should be sent in a fluoride oxalate tube (Grey top tube).
Ethylene Glycol	Blood	Fluoride Oxalate or EDTA			Clinical Chemistry Dispatch	**Routine** sample referred to City Hospital Birmingham. **Out of hours** contact on call duty Biochemist in Birmingham via switch 0044 121 507 5348, courier DHL 1890725725 use hospital account number.
EUS (Endoscopic Ultrasound)	Air-dried slides + checked stat	Sent in slide tray	5 days		Cytology	These must be booked with the Cytopathologist. *Cytolyt available from Cytology. Slides must be labelled in pencil with patient's full name and MRN (or

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
	for adequacy + needle rinse in Cytolyt*					DOB).
Eye Swabs	Eye Swabs	Bacterial Transport Swab /Viral swab (liquid UTM – red top containers only) available from microbiology dept.	48 - 96 hours	N/A	Microbiology	Used for investigation of conjunctivitis. For Virus detection referred to NVRL. Viral swabs referred to NVRL MUST be collected into liquid UTM (red top tubes). Do NOT use blue top eNAT swabs (used for Covid-19 testing). These will be rejected in NVRL
Fabry (Anderson Fabry)	Blood	6-10 mL EDTA Whole Blood	2 - 4 weeks	See Report	Clinical Chemistry Dispatch	External test sent to Willink 6th Floor Pod 1, St.Mary's Hospital, Oxford, Manchester.
Factor Assays	Blood	Sodium Citrate Light Blue Cap 3ml **x 3**	6 hours for urgent tests	See Report	Haematology	Tests done in batches unless requested urgently. Some coagulation factors are labile, please contact coagulation (Ext.4395) laboratory before taking samples. Sample stability = 4hrs post collection.
Factor V Leiden	Blood	Lavender EDTA 3mls and Sodium Citrate.	4 - 6 weeks	See Report	Haematology referral	Referred to Eurofins Biomnis. A separate EDTA sample must be taken for this test. A patient consent form **must** be filled out. Sample should not be opened prior to dispatch.
Faecal Elastase	Faeces	Universal Container with spoon (blue cap). Freeze sample	1 week		Clinical Chemistry Dispatch	Referred to external Lab (Eurofins Biomnis). Frozen sample.
Faeces PCR/ C.diff Screen/ Ova & Parasites/ Cryptosporidium	Faeces	Sterile Universal Container with spoon (blue cap) – pea sized sample required	PCR: 24-48 hrs C.diff Toxin: same day* O&Ps: up to 126 hrs	N/A	Microbiology	All positive results are phoned to the team/ clinician when confirmed. *Please send samples for *C. difficile* to laboratory before 12pm for same-day result. TAT is 24hrs if received after 12pm. C.diff will not be tested on formed stool samples. **O&P- Ideally three stool specimens collected over no more than a 10-day period. It is usually recommended that specimens are collected every other day. Send to lab as soon as collected. O&P tests will only be processed if relevant clinical details are provided.
Farmer's Lung Abs	Blood	Serum Gold Cap 5mls	10 days	N/A	Microbiology Dispatch	Referred to Royal Brompton Hospital, U.K.
Fasciola Abs IFAT	Blood	Serum Gold Cap 5mls	21 days	See Report	Microbiology Dispatch	Referred to Hospital for Tropical Diseases, London
Filaria Abs	Blood	Serum Gold Cap 5mls	21 days	See Report	Microbiology Dispatch	Referred to Hospital for Tropical Diseases, London

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Ferritin	Blood	Serum Gold Cap 5mL	Daily (Mon-Fri)	Female: 13 - 150 ug/L Male: 30 – 400 ug/L Post-menopausal female align more closely with male reference interval.	Clinical Chemistry	Non-specific elevations can occur in several different diseases. Biotin may cause some concentration dependent negative interference in this assay if high dose supplements are taken. If this is suspected, a repeat request 8 plus hours off Biotin is recommended in the first instance. Please contact the Duty Scientist on Ext 3127 for further details.
Fibrosis 4 (FIB4) Score	Blood	Serum Gold Cap 5mL EDTA Lavender Cap 3 mL	4 hours	See comments	Clinical Chemistry And haematology for PLTs	FIB 4 calculation is for patients with MASLD/MASH to predict the risk of advanced fibrosis. Diagnosis of MASLD requires: Negative liver screen, elevated ALT (>19, females; >30 males), <14/21 units of alcohol per week, features of Metabolic syndrome. Thresholds for referral: Use with caution in patients <35 years or >65 years. Consider referral to hepatology for fibroscan if patients with MASLD have FIB4>1.3 (aged 35-64) or >2.0 (age >65). If FIB4 does not require referral now, please repeat FIB4 3 yearly and manage cardiometabolic risk factors for MASLD. Please note, it is not advised to interpret the FIB-4 result if any of the following criteria are met; AST >250 , ALT >250 or PLT >500
Fibrinogen	Blood	Sodium Citrate Light Blue Cap 3ml	Urgent 1.5hrs Routine 4hr GP 2 working days	1.5 - 4.0 g/l	Haematology	Sample stability = 6hrs post collection.
Fibroblast Growth Factor 23 (FGF23)	Blood	EDTA Lavender Cap. 3 mL	4-6 weeks	less than 100 RU/mL	Clinical Chemistry	Fasting Sample Required. Specimen Referred to Norfolk and Norwich University Hospital.
Fine Needle Aspirate (FNA) N.B. See Thyroid FNA	e.g. Breast, Lymph node, Lung	In Cytolyt*	5 days		Cytology	* Cytolyt available from Cytology lab
FISH for Myeloma	Bone Marrow	Bone Marrow in EDTA tube – 3ml	21 days	See Report	Haematology Referred	Samples must be received into laboratory before 11.30 for dispatch mon – wed. Samples sent thurs/fri will not receive full analysis. Referred to Biomnis . Morphology report, bone marrow plasma cell count and Clinical details must be sent with the request or sample will not be processed.
FISH for CLL	Bone marrow or peripheral blood	Bone marrow in **RPMI or EDTA blood x 2 or Bone Marrow Slides x 4	3 – 4 weeks	See Report	Haematology Referred	Referred to National Centre for Medical Genetics, Crumlin Hospital. Crumlin genetics request form required Morphology report and Clinical details are essential

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
FISH for Lymphoma	Bone marrow or peripheral blood	Bone marrow in **RPMI or EDTA blood x 2 or Bone Marrow Slides x 4	3 – 4 weeks	See Report	Haematology Referred	Referred to National Centre for Medical Genetics, Crumlin Hospital. Crumlin genetics request form required. Morphology report and Clinical details are essential
Flow cytometry	Blood or bone marrow	See Immunophenotyping.	See Immunophenotyping.	See Immunophenotyping.	Haematology	See Immunophenotyping.
FLT3 Mutation	Bone Marrow	Bone Marrow in **RPMI	14-21 days	See Report	Haematology Referred	** Containers available from Haematology Dept. Referred to Molecular Diagnostic Laboratory, St. James Hospital. Samples should be received into laboratory before 11.30 for same day dispatch.
Flucytosine levels	Blood	Serum Gold Cap 5mls	13 days	See Report	Microbiology Dispatch	Referred to PHE Bristol, Mycology Reference Laboratory
Fluorescent *in-situ* Hybridisation (FISH) Her-2 neu test	Breast, Lymph node (other tissue can also be used)	Paraffin processed tissue	14 days		Histology	Test is requested by Pathologists. If Her 2 FISH is referred to an external centre turnaround time is 20 days.
Fluid Analysis (Total Protein, LDH, albumin, glucose, pH, amylase, triglycerides, cholesterol, creatinine, urea, uric acid and bilirubin)	Pleural, Peritoneal, Pericardial, Synovial, Drain, Dialysis, **non-viscous fluids**	Sterile Universal Container minimum 2 mL for all tests except glucose and pH For glucose; minimum of 1 mL fluid should be placed in a fluoride oxalate tube. Immediately bring to Biochemistry. For pH; minimum of 1 mL should be transferred immediately to an ABG heparinised syringe with all air expelled. Immediately bring to Biochemistry.	Daily	Pleural/Pericardial fluid: Light's criteria for exudate one of 1. Fluid/serum protein ratio >0.5 2. Fluid/serum LDH ratio >0.6 3. Fluid LDH activity >2/3 of the serum LDH upper reference limit Serum [albumin] – Fluid [albumin] If >12 g/L; transudate If ≤12 g/L; exudate Fluid cholesterol >1.2 mmol/L; exudate Fluid / serum	Clinical Chemistry	Use of serum tests in fluid samples has not been validated, is not CE marked and not INAB accredited. The source of the fluid must be stated on the request form. The collection time of the fluid must be stated on the request. All effusions should be accompanied by a paired serum sample. For non-viscous fluids which require pH, pH can be determined on ward based blood gas analysers using appropriate heparinised syringes. Blood contamination of fluid will contribute to the LDH activity measured and should be interpreted with this in mind. For interpretation of fluids results in Clinical Chemistry refer to section 16.0 in section 1 of the handbook : 16.0 REPORTING OF RESULTS, CLINICAL ADVICE AND INTERPRETATION

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
				cholesterol ratio > 0.3; exudate Peritoneal (ascitic) fluid: Serum [albumin] – Ascitic fluid [albumin] If ≥11 g/L; high portal pressure causes If <11 g/L; normal portal pressure causes		
Fluids for Microbiology (from normally sterile sites) Cell counts/Culture/ Crystals	Peritoneal / Ascitic/ Synovial/ Pleural	Sterile Universal Container and EDTA sample and Blood Culture bottles. (Do not put pleural fluids into BC bottles) *see comments	Culture 48-96hrs.	Pleural/Pericardial: WCC: 0-999/cmm Peritoneal(ascites): WCC: 0-200/cmm	Microbiology	Examination and identification of bi-refringent crystals performed on joint fluids. All pleural samples are sent for TB culture. EDTA sample optimal for cell counts but is not suitable for crystals – sodium heparin or plain tube required.
Folate	Blood	Serum Gold Cap 5mL	Daily (Mon-Fri)	N/A	Clinical Chemistry	Ideally patient should be fasting. Add-On requests for Folate are not accepted due to sample stability issues. Please state if patient is receiving folate supplements. Vitamin B12 is added automatically by IT rule to all folate requests. If folate <3 ug/L. Suggestive of folate deficiency. Causes include dietary deficiency, alcohol abuse, increased requirements such as pregnancy or red cell destruction, haemodialysis and chronic medication use such as anti-convulsants. Please perform a FBC to exclude megaloblastic anaemia. Routine screening for folate deficiency is not indicated https://www.hse.ie/eng/about/who/cspd/ncps/pathology/resources/guideline-5-laboratory-testing-for-folate-deficiency.pdf Add on requests are not accepted due to stability issues.
SFLC Serum Free Light Chains Kappa/Lamda Ratio	Blood	2 mL Serum Red/ Gold Cap Solely for SFLC.	7 days	•Serum Free Kappa Light Chains: 3.30 – 19.40 mg/L •Serum Free Lambda Light Chains; 5.71 – 26.3 mg/L •SFLC Ratio: 0.26 – 1.65 (Reference Interval in renal impairment: 0.37 – 3.10)	Clinical Chemistry	Measured in SVUH-Clinical Chemistry laboratory.

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Free T4 (free thyroxine)	Blood	Serum Gold Cap 5mL	Daily (Mon-Fri)	12.0 - 22.0 pmol/L	Clinical Chemistry	Usually used as a 2nd line reflex test to TSH. Biotin may cause some concentration dependent positive interference in this assay if high dose supplements are taken. If this is suspected, a repeat request 8 plus hours off Biotin is recommended in the first instance. Please contact the Duty Scientist on Ext 3127 for further details.
Free T3 (Free Triiodothyronine)	Blood	Serum Gold Cap 5mL	Daily (Mon-Fri)	3.1 - 6.8 pmol/L	Clinical Chemistry	Usually used as a 2nd line reflex test to TSH (and Free T4). Biotin may cause some concentration dependent positive interference in this assay if high dose supplements are taken. If this is suspected, a repeat request 8 plus hours off Biotin is recommended in the first instance. Please contact the Duty Scientist on Ext 3127 for further details.
Free Testosterone Index (Testosterone: SHBG ratio)	Blood	See Comment	4 days	Reference intervals are not provided in females <20 years old. Female 20-49y: 0.3-5.6 ≥50y: 0.2-3.6	Clinical Chemistry	This is a calculated test generated on females only. See testosterone and SHBG for specimen requirements. The ≥50 years reference interval has not been verified for use in those >70 years
Frozen Section Histology	Fresh tissue-bring to Lab immediately DO NOT USE POD	Dry in 60mls container. A Sterilin 30mls container is not suitable.	20 minutes		Histology	Notify Histology laboratory staff (Ext 4350) before taking specimen. Frozen sections must not be sent in the POD.
Fructosamine	Blood	Li-Heparin 5mL separated and refrigerated.	1 week	See Report	Clinical Chemistry Dispatch	Referred to Rotunda Hospital
Follicle Stimulating Hormone (FSH)	Blood	Serum Gold Cap 5mL	Daily Mon-Fri	Male: 2 - 12 U/L Female: Follicular 4 - 13 U/L Mid Cycle 5 - 22 U/L Luteal 2 - 8 U/L Post Menopause 26 - 135 U/L	Clinical Chemistry	State LMP. Biotin may cause some concentration dependent negative interference in this assay if high dose supplements are taken. If this is suspected, a repeat request 8 plus hours off Biotin is recommended in the first instance. Please contact the Duty Scientist on Ext 3127 for further details. In women aged 45 years and over presenting with menopausal symptoms, the diagnosis of perimenopause or menopause should be considered based on their symptoms alone, without confirmatory blood tests unless uncertainty about the diagnosis. In women under the age of 45 years presenting with menopausal symptoms, elevated gonadotropins (FSH >30 IU/L) should be looked for on at least two occasions measured four to six weeks apart. Laboratory monitoring of oestrogen replacement is neither mentioned in best practice nor recommended.

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Full Blood Count – FBC [WBC, Hb, RBC, HCT, MCV, MCH, RDW, Platelet count, White Cell Differential + NRBC]	Blood	EDTA Lavender Cap 3 mls	Routine 4hrs. Urgent 1.5hr GP/OPD- 48hours	See report	Haematology*	Differential included in Full blood count during routine hours. Available by request only out of hours. Sample stability = 24hrs post collection.
Fungal PCR	Tissue	Sterile Universal container	16 days	N/S	Microbiology Dispatch	Referred to PHE Bristol, Mycology Reference Laboratory
Galactomannam Refer to Aspergillus Antigen						
Gamma G T (GGT / Gamma Glutamyl Transferase)	Blood	Serum Gold Cap 5mL	4 hours	Male: 12 - 68 U/L Female: 6 - 40 U/L	Clinical Chemistry	Part of LFT profile.
Gastroenteritis virus screen (Includes Norovirus, Adenovirus, Rotavirus, Astrovirus, Sapovirus)	Faeces	Sterile Universal container	5 days	N/A	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin.
Gastrin	Blood	EDTA PLASMA 3mL	7 days	See report	Clinical Chemistry Dispatch	To be brought to Clinical Chemistry Laboratory within 45mins of collection referred to Belfast.
Gastrointestinal (GI) Biopsy - Urgent - Bowel Screen - Routine	Tissue	10% Formalin	5 days 5 days 15 days		Histology	Histology tissue (routine) must be fixed (in 10% formalin) immediately in containers of adequate size. The volume of fixative should be at least ten times the volume of the tissue. Bowel Screen biopsy must be accompanied by EndoRAAD report. **NOTE:** Friable/tiny tissue fragments may not survive processing. Please indicate on request form if tissue sent is friable/tiny.
Gaucher disease	Blood	2 x 6-10 mL blood sample in EDTA.	2 - 4 weeks	See Report	Clinical Chemistry Dispatch	Leucocyte beta glucocerebrosidase activity and DNA analysis requires 2 x 6 - 10 mL blood sample in EDTA. External test sent to Willink, 6th floor Pod 1, St. Mary's Hospital Oxford, Manchester, blood to be sent as soon as possible to the lab as analysis is required within 3 days of collection.

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Genetic Testing* (Excluding Haemochromatosis Genetic Screening)	Blood	EDTA 2 x 3mL	See comment	See Report	Clinical Chemistry Dispatch	* State clearly what genetic testing is required. Referred to External Laboratory depending on testing required. TAT minimum 1 month depending on referral lab, with the exception of karyotyping (10 days). A new version of the request form for ALL samples submitted for genomic testing is available online at Childrens Clinical Genetics Crumlin. Failure to use this form will result in sample rejection.Ensure correct consent is obtained, fully completed and **signed by the Consultant** only.
Genital Swabs Microscopy & Culture (Refer to separate test listings for Chlamydia trachomatis, Neisseria gonorrhea and TV)	Cervical/ Urethral High Vaginal Swab/Low Vaginal Swab/Vulval swab/penile swab	Bacterial Transport swab *	72hrs	N/A	Microbiology	
Gentamicin	Blood	Serum Gold Cap 5mL	Daily	See Comments for Therapeutic Range	Clinical Chemistry	Samples must be analysed within 24 hours of collection. All requests for gentamicin will have a creatinine measured automatically by IT rule. Target level is <1 mg/L for ALL patients. Ensure dose was calculated correctly and verify the level was taken >16 hours post-dose. If advice on dosing is required, the clinical Microbiology team can be contacted at extensions 4949/3459 or out of hours via the switchboard. Trough level <1 mg/L Maintain dosing regimen. Trough level ≥1 but ≤1.4 mg/L Reduce once daily dose by 1-2 mg/kg and repeat level 16-24 hours post-dose. Trough >1.4 mg/L Hold and repeat level next day. Do not re-dose until level <1 mg/L.
GI Hormones/ Gastric Peptides (including Chromogranin	Blood	Four - EDTA Lavender Cap on ice, plasma separated and frozen.	6 -10 weeks	See Report	Clinical Chemistry Dispatch	Referred to outside laboratory - Regulatory Peptide Lab., Belfast.
Giardia Abs	Blood	Serum/ 5-10ml	10 days	N/A	Microbiology Dispatch	Referred to Hospital for Tropical Diseases London.

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Calculated Globulin (Please also see ALB (Albumin) and Total Protein)	Blood	Serum Gold Cap 5mL	4 hours	25 to 40 g/L	Clinical Chemistry	Calculated Globulin is reported where serum Albumin and serum Total Protein are measured.
Glucose Glucose (Point of –care, Glucometer)	Blood Blood	Fluoride Oxalate (Grey topped vacutainer) – 2mL Whole Blood	4 hours	4.0 - 6.0 mmol/L (Fasting) 4.0-11.1 mmol/l (Random)	Clinical Chemistry	For further interpretation of fasting and random plasma glucose values, please see interpretative comments on report form. Please mark tube fasting if patient is fasting. Venepuncture should be performed prior to the administration of Metamizole as metabolites may cause interference with analysis.
Glucose (Fluid)	Non viscous bodily fluid, typically pleural	For glucose; minimum of 1 mL fluid should be placed in a fluoride oxalate tube. Immediately bring to Biochemistry.	Daily	N/A	Clinical Chemistry	Use of serum tests in fluid samples has not be validated, is not CE marked and not iNAB accredited. The source of the fluid must be stated on the request form. The collection time of the fluid must be stated on the request. All effusions should be accompanied by a paired serum sample.
Glucose 6 Phosphate Dehydrogenase or G-6PD	Blood	EDTA Lavender Cap 3 mls	5 days	See Report	Haematology Referred	Referred to Eurofins Biomnis. Samples must be received into laboratory before 11.30 for same day dispatch. FBC results should be included with sample.
Glucose Tolerance Test (GTT)	Blood - Fasting & 2 hour post 75g glucose load	Fluoride Oxalate Grey Cap 2mL	7 hours	Diabetes Mellitus: Fasting ≥7.0 mmol/L and/or 2h post glucose load ≥11.1 mmol/L Impaired Glucose Tolerance (IGT): Fasting <7.0 mmol/L and/or 2h post glucose load ≥7.8 and < 11.1 mmol/L Impaired Fasting Glycaemia (IFG): Fasting ≥ 6.1 and < 7.0 mmol/L	Clinical Chemistry	Please refer to GTT Protocol (available from Clinical Chemistry or Phlebotomy Dept). For GTT performed on in-patients wards the glucose material (Polycal) and GTT protocol may be obtained from Pharmacy. Interpretation: In the absence of symptoms of D.M., diagnosis requires confirmation with at least one additional diagnostic blood glucose measurement on another day. Other causes of a raised blood glucose should be excluded. The values given under "Reference Range", refers to plasma venous glucose concentrations. Please give time of collection for fasting and 2h pp specimen.

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Growth Hormone	Blood	Serum Separated and frozen	21 days	Female: 0.13 - 9.88 ug/L Male: <0.1 - 2.47 ug/L	Clinical Chemistry	Tests dispatched to Beaumont Hospital. Basel levels of growth hormone do not have a diagnostic relevance. Stimulation/Inhibition tests are recommended to assess growth hormone disorders. Biotin may cause some concentration dependent negative interference in this assay if high dose supplements are taken. If this is suspected, a request 8 plus hours off Biotin is recommended in the first instance. Please contact the Duty Scientist on Ext 3127 for further details.
Gynae Cervical Samples	Cervical sample into liquid fixative (Preservcyt)	Preservcyt (in Gynae OPD)	N/A		Cytology	Samples are sent to the Coombe Hospital, Dublin.
H1N1 (Swine Flu) – see Influenza	Viral Swabs: Nose and Throat	Viral swab (liquid UTM - red top tubes).				
C282Y Variant H63D Variant Haemochromatosis Genetic Test	Blood	2 X EDTA Lavender Cap	28 days	N/A	Clinical Chemistry	With respect to requests from Primary Care, Hereditary Haemochromatosis HFE gene mutation analysis will only be carried out if: 1. There is a family history of haemochromatosis OR 2. Biochemical iron overload is evident i.e. fasting Transferrin Saturation >45%.
Haemoglobin	Blood/Drain Fluid	EDTA Lavender Cap 3mls	Urgent 1hr Routine 4hrs	See Report	Haematology*	Sample stability = 48hrs post collection
HbA1c HPLC (EDTA)	Blood	EDTA Lavender Cap 3 mL A separate EDTA sample is required if requesting HbA1c	3 days	20-42 mmol/mol	Clinical Chemistry	An HbA1c of 48 mmol/mol or greater is consistent with diabetes provided erythrocyte turnover is normal. Please note difference in methodology between SVUH and SVPH Chemistry Laboratories.
Haemoglobin A1c (Roche Immunoassay Method)	Blood	EDTA Lavender Cap 3 mL	3 days	20 - 42 mmol/mol	SVPH Satellite Laboratory (Chemistry) Only	An HbA1c of 48 mmol/mol or greater is consistent with diabetes provided erythrocyte turnover is normal. Please note difference in methodology between SVUH and SVPH Chemistry Laboratories. HbA1c measured by Roche immunoturbidimetric assay. Some haemoglobin variants cannot be accurately determined by this assay. Diabetic patients with HbAS, HbAC, HbAE can have their metabolic state determined by this assay.
Haemoglobinopathy Screen: Thalassaemia Screen or Haemoglobin A2 or	Blood	EDTA Lavender Cap 3mls x 2	5 working days	See Report	Haematology Referred	Referred to France via Eurofins Biomnis. Samples must be received into laboratory before 11.30 for same day dispatch. FBC results should be sent with samples.

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
F/Abnormal HB's or Haemoglobin electrophoresis						
Haemoglobin genetic testing	Blood	EDTA Lavender cap 3mls x 5	5 days	See Report	Haematology Referred	Referred to Eurofins Biomnis. A patient consent form **must** be filled out. Sample should not be opened prior to dispatch. FBC results should be sent with samples.
Haemolytic Anaemia Screen inc; FBC, Blood Film, Retic Count.	Blood	EDTA Lavender Cap 3 mls	See Individual test TAT	See individual test	Haematology	Also request: Haptoglobins, Direct Coombs Test, Bilirubin and LDH.
Haemophilus Abs	Blood	Serum Gold Cap 5mls	28 days	See Report	Microbiology Dispatch	Referred to Immunology Laboratory, St. James's Hospital
Haemophilus influenzae PCR	CSF, Blood	CSF EDTA / 6mls	Positive results phoned same day 16.00-17.00 if received before 11.00	N/A	Microbiology Dispatch	Referred to IMMRL, Temple Street
Hantavirus Abs	Blood	Serum Gold Cap 5mls	Only tested by specific arrangement	See Report	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin.
Haptoglobins	Blood	Serum Gold cap – separated within 2hrs	10 days	0.45 - 2.42 g/l	Haematology Referred	Sample stability = 12hrs post collection separated and stored at 4'C. Referred to Eurofins Biomnis
hCG (Pregnancy test)	Blood	Serum Gold Cap 5mL	Daily	Female: Non-pregnant pre-menopausal <5.3 IU/L Post-Menopausal <8.3 IU/L	Clinical Chemistry	There are two tests to check for pregnancy; serum hCG and urine. We recommend sending a serum sample as the result will be positive before the urine hCG result. Serum hCG can be requested out-of-hours. hCG levels may remain detectable for up to several weeks following delivery, miscarriage or hCG injections (IVF). Caution: Biotin may cause some concentration dependent negative interference in this assay if high dose supplements are taken. If this is suspected, a repeat request 8 plus hours off Biotin is recommended in the first instance. Please contact the Duty Scientist on Ext 3127 for further details.
hCG (Pregnancy test)	Urine	Mid Steam spot/random Urine	Daily	Hormone levels in urine greater than 25 IU/L are reported as positive.	Clinical Chemistry	Siemens Healthcare Diagnostic hCG Pregnancy Test is a qualitative method for the rapid detection of hCG in urine. We recommend sending a serum sample as the result will be positive

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
				Samples reported as borderline (between 5 and 25 IU/L) are considered indeterminate and need to be repeated 48-72h later.		before the urine hCG result. All qualitative pregnancy tests will produce a small number of false positive results (<1%). If a positive test result is obtained and non-pregnancy is suspected, it is standard practice to repeat the test with another urine sample obtained 48h later. In acute situations the results can be confirmed with a serum hCG result. hCG levels may remain detectable for up to several weeks following delivery, miscarriage or hCG injections (IVF).
hCG (as a tumour marker)	Blood	Serum Gold Cap 5mL	Daily Mon - Fri	Female: Non-pregnant pre-menopausal <5.3 IU/L Post-Menopausal <8.3 IU/L Male <2.6 IU/L.	Clinical Chemistry	Quantitative test measuring total hCG by Roche immunoassay. Tumour marker results can vary depending on the testing procedure used. Values determined on patient samples by different testing procedures cannot be directly compared with one another and could be the cause of erroneous medical interpretations. It is advised to have this test measured in the same laboratory for the duration of treatment and follow-up. Caution: Biotin may cause some concentration dependent negative interference in this assay if high dose supplements are taken. If this is suspected, a repeat request 8 plus hours off Biotin is recommended in the first instance. Please contact the Duty Scientist on Ext 3127 for further details. Tumor marker results can used as an aid to cancer management but not as a case finding approach or general screen for cancer.
HDL Cholesterol (Please also see Lipid Profile)	Blood	Serum Gold Cap 5mL	4 hours	N/A	Clinical Chemistry	Venepuncture should be performed prior to the administration of Metamizole as metabolites may cause interference with analysis. For lipid interpretation please see ESC/EAS guidelines for the management of dyslipidaemias. European Heart Journal (2019) doi.org/10.093/eurheartj/ehz455 "There are a number of well validated cardiovascular disease risk assessment systems available that are recommended as part of different guidelines. The 2019 European Guidelines on cardiovascular disease prevention in clinical practice provide a list of commonly used tools and the authorities recommending them. There is no consensus recommendation on which of these systems should be used, but it is agreed that these tools can enhance clinical decision making in the primary prevention of cardiovascular disease."

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Helicobacter pylori	Gastric biopsy	Sterile universal container	7 days	N/A	Microbiology	Specimen should be processed within 6 hrs.
Heparin Assay	Blood	Sodium Citrate Light Blue Cap 3 mls	6 hours	See Report	Haematology	See Anti Xa Assay. Contact Coagulation laboratory (ext.4395) to pre-arrange assay. Sample stability = 1 hr post collection
Heparin Induced Thrombocytopenia Screen [HITS]	Blood	2 x Serum red or gold cap	1 week (Provisional Verbal results available same day)	See Report	Haematology Referred	Specimens referred to Coagulation Lab, NCHCD, St. James's Hospital (Tel 01 4162956) Specimen must be received in SJH before 4pm. NB - HIT request form MUST be filled out. Forms available in Haematology Lab.
Hepatitis A, B, C Abs	Blood	Serum Red/Gold Cap 5 mls	7 days	See Report	Microbiology Dispatch	Referred to National Virus Reference. Laboratory University College Dublin.
Hepatitis A PCR	Blood Stool	Serum Gold Cap 5mls	Only tested by specific arrangement	See Report	Microbiology Dispatch	Send to Microbiology Dispatch within 6 hours of sampling. Referred to National Virus Reference Laboratory University College Dublin.
Hepatitis B Viral load	Blood	Serum Gold Cap 5mls	7 days	N/A	Microbiology Dispatch	Send to Microbiology Dispatch within 6 hours of sampling. Referred to National Virus Reference Laboratory University College Dublin.
Hepatitis B Genotype	Blood	Serum Gold Cap 5mls	Only tested by specific arrangement	N/A	Microbiology Dispatch	Send to Microbiology Dispatch within 6 hours of sampling. Referred to National Virus Reference Laboratory University College Dublin.
Hepatitis C Viral Load	Blood	2xSerum Red/Gold Cap 5 mls	12 days	See Report	Microbiology Dispatch	Send to Microbiology Dispatch within 6 hours of sampling. Referred to National Virus Reference Laboratory University College Dublin.
Hepatitis C Genotype	Blood	Serum Gold Cap 5mls	20 days	See Report	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin.
Hepatitis C Resistance Genotyping including Q80K	Blood	Serum Gold Cap 5mls	20 days	See Report	Microbiology Dispatch	Send to Microbiology Dispatch within 6 hours of sampling. Referred to National Virus Reference Laboratory University College Dublin.
Hepatitis D (Delta) Abs – HbsAg negative samples will not be tested	Blood	Serum Gold Cap 5 mls	14 days	N/A	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin.

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Hepatitis E Abs	Blood	Serum Gold Cap 5mls	14 days	N/A	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin.
Hepatitis E PCR	Blood	Serum Gold Cap 5mls EDTA Lavender Cap 3mls	Only tested by specific arrangement	N/A	Microbiology Dispatch	Send to Microbiology Dispatch within 6 hours of sampling. Referred to National Virus Reference Laboratory University College Dublin.
Her2 Immunohistochemistry	Breast or Lymph node (other tissue can also be used)	Paraffin processed tissue	10 days		Histology	Phone requests to Immunohistochemistry lab 4797 Her2 requests in Gastric Cancer are sent to Mater Misericordiae University Hospital – TAT is 4 weeks.
Herpes simplex virus (HSV) Abs	Blood	Serum Gold Cap 5mls	7 days	See Report	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin.
Herpes Simplex virus (HSV) culture	Throat swab NPA BAL Urine	Red top liquid viral swab Sterile Universal container	14 days	N/A	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin. Viral swabs referred to NVRL MUST be collected into liquid UTM (red top tubes). Do NOT use blue top eNAT swabs (used for Covid-19 testing). These will be rejected in NVRL
Herpes Simplex virus (HSV) PCR	CSF Blood from immuno-compromised	CSF EDTA Lavender Cap 3mls	6 days	N/A	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin.
Herpes Simplex virus (HSV) PCR	Fluids Tissue	Sterile Universal container	9 days	N/A	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin.
HHV 6, 7 or 8 (Human Herpes virus 6, 7 or 8) Abs Discuss with Microbiology registrars	Blood	Serum Gold Cap 5mls	Only tested by specific arrangement	See Report	Microbiology Dispatch	Referred to PHE Colindale, Virus Reference Division
HHV 6, 7 or 8 (Human Herpes virus 6, 7 or 8) PCR Discuss with Microbiology	CSF Blood	CSF, Serum Gold Cap 5mls or EDTA Lavender Cap 3mls	23 days	See Report	Microbiology Dispatch	Referred to PHE Colindale, Virus Reference Division

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
registrars						
Histamine	Blood	EDTA	14 days	See Report	Clinical Chemistry Dispatch	Refrigerated Whole EDTA blood/ Frozen EDTA Plasma (<4 HRS) to Eurofins Biomnis.
Histoplasma Abs	Blood	Serum/ 5-10ml	17 days	N/A	Microbiology Dispatch	Referred to PHL Myrtle Road, Bristol, U.K.
HIV Abs	Blood	Serum/ 5-10ml	7 day	N/A	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin.
HIV Viral load	Blood	EDTA Lavender Cap 3mls	9 days	See Report	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin.
HIV Resistance testing	Blood	EDTA Lavender Cap 3mls	18 days	See Report	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin.
HLA Allo Antibodies	Blood	Serum Gold Cap	7 days	See Report	Blood Bank	Referred to National Blood Centre.
HLA B27 Typing	Blood	EDTA x 3	5 days	See Report	Haematology Referred	Referred to National Blood Centre. Samples must be received into laboratory before 11.30 for same day dispatch.
HLA B51	Blood	EDTA x 3	10 days	See Report	Haematology Referred	Referred to National Blood Centre. Samples must be received into laboratory before 11.30 for same day dispatch.
HLA Class 2 (DR, DQ, DP)	Blood	EDTA x 3	10 days	See Report	Haematology Referred	Referred to National Blood Centre. Samples must be received into laboratory before 11.30 for same day dispatch.
HLA Typing for Kidney Transplant	Blood	1 x Sodium Citrate (3 mL) + 1 x EDTA	2 weeks	See Report	Clinical Chemistry Dispatch	** Collection tube available from Phlebotomy. Referred to Histocompatibility Dept, Beaumont Sarstedt/BD Tubes acceptable
HLA Typing for Liver Transplants (patients and family members)	Blood	1 x Sodium Citrate (3 mL) + 1 x ETDA	2 weeks	See Report	Clinical Chemistry Dispatch	** Collection tube available from Phlebotomy. Referred to Histocompatibility Dept, Beaumont Sarstedt/BD Tubes acceptable
HLA Typing for Lung Transplant	Blood	1 x Sodium Citrate (3 mL) + 1 x EDTA	2 weeks	See Report	Clinical Chemistry Dispatch	** Collection tube available from Phlebotomy. Referred to Histocompatibility Dept, Beaumont Sarstedt/BD Tubes acceptable

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
HLA Typing for Matched Platelets	Blood	EDTA/citrate x 3	7 days	See Report	Blood Bank	Referred to National Blood Centre.
HLA I & II Typing B one Marrow Transplant Patients	Blood	EDTA x 3	5 days	See Report	Haematology Referred	Referred to National Blood Centre, St. James Hospital. Samples must be received into laboratory before 11.30 for same day dispatch.
Homocysteine	Blood	EDTA Lavender Cap - 5mL on ice	14 days	Fasting/basal levels: Pregnancy 0 to less than 10 umol/L 0 – 15 years 0 to less than 10 umol/L 15 - 65 years 0 to less than 15 umol/L >65 years 0 to less than 20 umol/L	Clinical Chemistry	Please send specimen on ice and deliver to the lab immediately. Please send full clinical details. Ideally patient should be fasting. For homocysteine results >=50 umol/L the following comment will be appended to patient results: 'Please note elevated homocysteine concentration. In the presence of normal renal function, measurement of vitamin B12 and folate is advisable if not previously measured. Age, pregnancy, and renal function are important. The intake of folic acid as either supplements or through fortification of foods must also be considered.'
HPV (Human Papilloma Virus) PCR	Mucous, cutaneous or genital smaples and biopsies (warts, verrucas). Swab	Sterile Universal container Swabs require use of virus transport medium supplied by Eurofins Biomnis on request Refrigerate samples	9 days	N/A	Microbiology Dispatch	Referred to Eurofins Biomnis
HTLV1+2 Abs	Blood	Serum Gold Cap 5mls	7 days	See Report	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin.
Human Metapneumovirus PCR – see respiratory virus screen	Sputum NPA Throat wash Respiratory secretions	Sterile Universal container	7 days in season 9 days out of season	See Report	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin.

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Humira Antibody (Adalimumab) & anti-adalimumab antibodies	Blood	Serum Gold Cap 5mls	20 days	See report	Immunology	Samples must be sent immediately to laboratory for separation and freezing (within one hour). Specimens Referred to Eurofins Biomnis.
Hydatid Disease Abs	Blood	Serum Gold Cap 5mls	21 days	N/A	Microbiology Dispatch	Referred to Hospital for Tropical Diseases London.
Interleukin-6 (IL-6)	Blood	Serum Gold Cap 5mL	Daily	1.5-6.9 pg/mL	Clinical Chemistry	
Insulin like Growth Factor 1 (IGF-1)	Blood	Serum Gold Cap 5mL	7 days	Reference intervals are not provided in those <16 years old. Females: 16yr: N/A 16 -17 : 154 - 485 17-18 y: 156 - 479 18 -19 y: 156 - 466 19 -20 y: 155 - 449 20 -21 y: 152 - 429 21 -22 y: 148 - 410 22 –23 y: 143 -392 23 –24 y: 138 -375 24 –25 y: 134 -359 25 -26 y: 130 - 343 26 –27 y: 126 -329 27 –28 y: 122 -315 28 –29 y: 118 –303 29 –30 y: 115 -292 30 –35 y: 102 -281 35 –40 y: 93. -242 40 –45 y: 84.9-227	Clinical Chemistry	Provide age and gender. No reference intervals available for persons >80 years, values for age 75-80y given and comments added to state range not verified for >80. No RI for <16y, on Apex we use NA (NOT AVAILABLE) and a comment stating RI not available.

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
				45 –50 y: 77.2-220 50 –55 y: 70.0-215 55 –60 y: 63.3-204 60 –65 y: 57.3-186 65 –70 y: 53.8-170 70 –75 y: 53.2-162 75 –80 y: 53.5-164 >80 y: 55.1-166 Males: 16 y: N/A 16 -17 y: 125-503 17-18 y: 129-495 18 -19 y: 132-476 19 -20 y: 134-450 20 -21 y: 136-421 21 -22 y: 137-394 22 –23 y: 137-370 23 –24 y:136-348 24 –25 y: 135-328 25 -26 y: 132-310 26 –27 y: 130-295 27 –28 y: 128-282 28 –29 y: 125-271 29 –30 y: 123-263 30 –35 y: 111-257 35 –40 y: 101-242 40 –45 y: 90.5-229 45 –50 y: 80.6-216 50 –55 y: 70.9-205 55 –60 y: 62.3-196 60 –65 y: 57.9-191		

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
				65 –70 y: 55.2-187 70 –75 y: 53.0-185 75 –80 y: 49.6-184 >80 - NA		
Immunofixation 1. Serum 2. Urine	Blood Urine	Serum Gold Cap 5 mL Urine 20 mL	Serum 21days Urine 14 days		Immunology	This procedure confirms and identifies the presence of a monoclonal immunoglobulin (follow on test to serum electrophoresis, and first line test for detection of BJP).
Immunoglobulin Gene Rearrangement	Bone Marrow or Blood	Marrow in **RPMI or EDTA Lavender Cap 3ml x 2.	14-21 days	See Report	Haematology	Useful in B Cell Malignancies. ** Containers available in Haematology Lab. Referred to Molecular Diagnostic Laboratory in St. James's Hospital. Samples must be received into lab before 11.30 for same day dispatch.
IgE (Immunoglobulin E)	Blood	Serum Gold Cap 5mL	3 days	0 - 100 kU/L (healthy non-allergic adults)	Clinical Chemistry	A normal Total IgE level does not exclude an increased concentration of a specific IgE antibody. Biotin may cause some concentration dependent negative interference in this assay if high dose supplements are taken. If this is suspected, a repeat request 8 plus hours off Biotin is recommended in the first instance. Please contact the Duty Scientist on Ext 3127 for further details.
IgG (Immunoglobulin G) IgM (Immunoglobulin M) IgA) (Immunoglobulin A)	Blood	Serum Gold Cap 5mL	3 days	IgG: 8 - 15 g/L, IgM: 0.4 - 2.4 g/L, IgA: 0.9 - 4.3 g/L	Clinical Chemistry	The presence of high concentration of paraproteins may result in overestimation of the respective immunoglobulin class.
Immunophenotyping	Blood Bone marrow	EDTA x 1 (3 mls) Bone marrow/Pleural Fluid (** Heparinised in RPMI)	14 days	See Report	Haematology	Provisional results available within 48hrs. Immunophenotyping request forms available in Laboratory. ** Specimen containers available from Haematology. Consult Haematology Medical Team for Immunophenotyping requests. Prior arrangement with lab (4792) is essential. Sample stability = 72hrs post collection.
Immunohistochemistry staining (in house test)	Tissue / cytology		3 days		Histology	Phone requests to immunohistochemistry lab Ext 4797
Immunohistochemistry staining (external test)	Tissue / cytology		5 – 10 days depending on IHC request and referral centre			Phone requests to immunohistochemistry lab Ext 4797

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Infectious Mononucleosis screen (previous names Monospot / Paul Burnell)	Blood	EDTA Lavender Cap 3mls or Serum Gold Cap Tube/3mls	2 days	Negative	Haematology	This antibody is present within 1-12 weeks after onset of symptoms in 80-90% of cases of infectious mononucleosis. It may persist for up to one year. Up to 50% of infected children under four years of age may fail to produce this antibody. Sample stability = 72 hrs post collection
Infliximab & anti-Infliximab antibodies	Blood	Serum Gold Cap Tube/3mls or EDTA Lavender Cap 3mls	20 d	See report	Immunology	Specimens Referred to Eurofins Biomnis
Influenza PCR including: COVID-19 (SARS-CoV-2) Influenza A Influenza B RSV	Nasopharyngeal/ deep throat swab	Liquid Viral Swab eNAT swab (blue top) 2ml	Rapid test: 12 hrs Batch test: 24 hrs	N/A	Microbiology	Nasopharyngeal swab collected into eNAT container (blue top). Red top swab containers with liquid viral UTM may still be used if there is a shortage of eNAT swabs. All viral swabs are available from microbiology laboratory. Tests will only be performed between 08.00 and 19.20 Mon-Fri, and between 09.30 and 12.00 Sat and Sun. NOTE: If extended respiratory viral testing (performed in NVRL) is required Red top swab containers with liquid viral UTM must be used.
Influenza PCR including: Influenza A Influenza B Influenza H1N1 (Swine flu)	Sputum, NPA, throat wash, respiratory secretions Nasopharyngeal/ Nasal and throat swab liquid viral UTM (red top container)	Sterile Universal container Viral swab (liquid viral UTM – red top container)	7 days in season 9 days out of season Positive results are phoned to Microbiology team	N/A	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin. Viral swabs referred to NVRL MUST be collected into liquid UTM (red top tubes). Do NOT use blue top eNAT swabs (used for Covid-19 testing). These will be rejected in NVRL
INR	Blood	Sodium Citrate Light Blue Cap 3 mls	Urgent 1.5hrs Routine 4hrs GP – 2 working days	See Report	Haematology*	Used for warfarin monitoring. One sample sufficient for PT, INR, APTT, APTT Ratio, D-Dimers and Fibrinogen. Sample stability = 24hrs post collection
Insulin	Blood	Serum Gold Cap 5mL	Daily Mon-Fri	Fasting 3 - 25 mU/L	Clinical Chemistry	State whether fasting or post prandial. "Serum samples for insulin are best taken at SVUH phlebotomy. If samples are sent from other labs or GP practices, please separate the serum preferably within 30 min of collection (but we will accept within 2 hours of collection) and freeze at -20C." The Insulin assay is relatively specific for Human Insulin and does not generally detect Insulin Analogues. Please contact the Duty Scientist on

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
						Ext. 3127 for further information if required. Biotin may cause some concentration dependent negative interference in this assay if high dose supplements are taken. If this is suspected, a repeat request 8 plus hours off Biotin is recommended in the first instance. Please contact the Duty Scientist on Ext 3127 for further details.
Internal Limiting Membrane (ILM) Peel	Membrane	Eppendorf (with or without saline)	15 days		Cytology	Sent from Royal Victoria Eye and Ear Hospital, Dublin.
Internal Limiting Membrane (ILM) Wash	Fluid		15 days		Cytology	Sent from Royal Victoria Eye and Ear Hospital, Dublin.
Iron Stain	Bone Marrow	Slides	10 days	See report	Haematology	N/A
Iron including Iron, Transferrin, TIBC (calculated),% Iron Binding Saturation, transferrin saturation (calculated)	Blood	Serum Gold Cap 5mL (for all Iron Status tests)	4 hours	Iron: 5.8-34.5µmol/L, Transferrin: 2.00 - 3.60 g/L , TIBC Calculated: 44.80-71.60 µmol/L, % Transferrin saturation >45% (fasting) may be consistent with iron overload.	Clinical Chemistry	Fasting specimen is preferred. Tests should not be requested if patient is taking Iron supplements. Results of iron studies required if Haemochromatosis genetics is required.
Itraconazole levels	Blood	Serum Gold Cap 5mls	14 days	See Report	Microbiology Dispatch	Referred to PHE Mycology Reference Laboratory, Bristol
IV cannulae for C/S	IV cannula	Sterile universal container	48-96h	N/A	Microbiology	For semi-quantitative analysis, cannula tip of 4-5cm is required
JAK2 Mutation	Blood	EDTA Lavender Cap 3mls X 2	28 days	See Report	Haematology Referred	Useful in Myeloproliferative Disorders. Referred to St. James's Hospital. Samples must be received into laboratory before 11.30 for same day dispatch.
JC virus PCR	Blood CSF Fresh urine	Serum Gold Cap 5mls or EDTA Lavender Cap 3mls Sterile Universal container	9 days	N/A	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin.
Karyotyping	Blood	Non gel Li-Hep whole blood 5mls	13 days	See Report	Haematology Referred	>18 yrs old: Specimen referred to Eurofins Biomnis. <18 yrs old: Specimen referred to Crumlin Consent form must be filled out. Not available to GP's.

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Keppra (Levetiracetam)	Blood	Serum Red Cap 5mL	5 days	10-40 mg/L	Clinical Chemistry Dispatch	Referred to Eurofins Biomnis Non-gel serum is required frozen within 4 hours of receipt in laboratory. Therapeutic range provided applies to a trough level.
Kleihauer Test/RhD positive cells quantification by Flow Cytometry	Blood	EDTA Pink Cap 6ml	1 day	See Report	Blood Bank via Haematology Dispatch	Referred to National Maternity Hospital for Kleihauer and Rotunda for Flow Cytometry. Samples must be received in Blood Bank Mon-Fri 08:00hrs to 16:00 hrs.
Lactate	Blood	Blood: Pre-heparinised blood gas syringe - ABG 2mL on ice.	15 min	Blood: arterial 0.4 – 0.8 mmol/L, Venous 0.6 - 1.4 mmol/L	Clinical Chemistry	NB: Bloods for Lactate analysis must be placed on ice immediately and transported without delay to Clinical Chemistry.
Lactate CSF	CSF	CSF: sterile universal container - 1 mL (minimum)	Referred test.	CSF: refer to clinical protocol	Clinical Chemistry Dispatch	CSF specimen for Lactate must be brought to Clinical Chemistry immediately as the specimen must be frozen within 30 minutes.
LDH (IFCC) (Lactate Dehydrogenase)	Blood	Serum Gold Cap 5mL	4 hours	135-250 U/L	Clinical Chemistry	
Lamictal/Lamotrigine	Blood	Serum Red Top 1mL	7 days		Clinical Chemistry Dispatch	Referred to Eurofins Biomnis Non-gel serum is required frozen within 4hours of receipt in laboratory
LDL Cholesterol (calculated) (Please also see Lipid Profile)	Blood	Serum Gold Cap 5mL	4 hours	N/A	Clinical Chemistry	LDL cannot be calculated if triglycerides are >4.5 mmol/L. LDL >5 mmol/L: Significantly elevated LDL-cholesterol – patient at high risk of CVD. If there is a personal or family history of premature vascular disease then this patient may have Familial Hypercholesterolaemia. For lipid interpretation please see ESC/EAS guidelines for the management of dyslipidaemias. European Heart Journal (2019) doi.org/10.093/eurheartj/ehz455: "There are a number of well validated cardiovascular disease risk assessment systems available that are recommended as part of different guidelines. The 2019 European Guidelines on cardiovascular disease prevention in clinical practice provide a list of commonly used tools and the authorities recommending them. There is no consensus recommendation on which of these systems should be used, but it is agreed that these tools can enhance clinical decision making in the primary prevention of cardiovascular disease."

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Lead	Blood	EDTA whole blood.	15 days	<0.5 umol/L	Clinical Chemistry Dispatch	Referred to Outside Laboratory (Eurofins Biomnis). Specimens must be received into laboratory before 12.00 for same day dispatch.
Legionella Urinary Antigen	Urine	Sterile Universal container 5-10ml	24hrs (Mon-Fri)	N/A	Microbiology	Part of screen for community-acquired pneumonia.
Leishmania Abs	Blood	Serum/ 5-10ml	17 days	N/A	Microbiology Dispatch	Referred to Hospital for Tropical Diseases London.
Leptospira Abs	Blood	Serum/ 5-10ml	8 days	N/A	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin.
Leucocyte beta glucocerebrosidase					Clinical Chemistry Dispatch	See Gaucher Disease
Levetiracetam (Keppra)	Blood	Serum Red Cap 5mL	14 days	10-40 mg/L	Clinical Chemistry Dispatch	Referred to Eurofins Biomnis Non-gel serum is required frozen within 4hours of receipt in laboratory. Therapeutic range provided applies to a trough level.
Luteinising Hormone (LH)	Blood	Serum Gold Cap 5mL	Daily Mon-Fri	Male: 2 - 9 U/L, Female: Follicular 2 -13 U/L, Mid Cycle 14 - 96 U/L, Luteal 1 - 11 U/L Post Menopause 8 - 59 U/L	Clinical Chemistry	State LMP. Biotin may cause some concentration dependent negative interference in this assay if high dose supplements are taken. If this is suspected, a repeat 8 plus hours off Biotin is recommended in the first instance. Please contact the Duty Scientist on Ext 3127 for further details. In women aged 45 years and over presenting with menopausal symptoms, the diagnosis of perimenopause or menopause should be considered based on their symptoms alone, without confirmatory blood tests unless uncertainty about the diagnosis. In women under the age of 45 years presenting with menopausal symptoms, elevated gonadotropins (FSH >30 IU/L) should be looked for on at least two occasions measured four to six weeks apart. Laboratory monitoring of oestrogen replacement is neither mentioned in best practice nor recommended.
Lipase- NA see note opposite	Blood	Serum Gold Cap 5mL (amylase)	4 hours (amylase)	See Report	Clinical Chemistry	Amylase is now measured instead of Lipase to prevent delay in diagnosis of Pancreatitis. Lipase not routinely available.
Lipids Includes Cholesterol, HDL Cholesterol, non-HDL Cholesterol,	Blood	Serum Gold Cap 5mL	4 hours	See under individual tests	Clinical Chemistry	For lipid interpretation, please see ESC/EAS Guidelines for the management of dyslipidaemias. European Heart Journal (2011) 32, 1769-1818 doi: 10.1093/eurheartj/ehr158

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Calculated LDL Cholesterol, Triglycerides, T.Chol/HDL Ratio (Total Cholesterol/HDL Ratio)						
Lipoprotein a Please see note opposite	Blood	Serum Gold Cap 5mL	1 week	See Report	Clinical Chemistry Dispatch	Referred to external lab. (Eurofins Biomnis). This test is not available for GP requesting, only for SVUH, SVPH Consultants.
Listeria Abs	Blood	Serum Gold Cap 5mls	8 days	See Report	Microbiology Dispatch	Referred to Eurofins Biomnis
Lithium	Blood	Serum Gold Cap 5mL	Daily	Therapeutic Range: 0.6 - 1.2 mmol/L	Clinical Chemistry	Specimens should be taken at least 12 hours after dose. **Please Note:** Serum specimen only. Samples must be analysed within 24 hours of collection. All requests for lithium will have a creatinine measured automatically by IT rule. On a lithium request where no TSH has been measured in the previous 365 days a TSH will be added to the order automatically by IT rule.
Liver Biopsy: • For tumour diagnosis only • Medical liver biopsy	Liver biopsy tissue	10% Formalin in container of adequate size	5 days 15 days		Histology	Histology tissues (routine) must be fixed (in 10% formalin) immediately in containers of adequate size. The volume of fixative should be at least ten times the volume of the tissue. Please phone laboratory prior to sending **urgent biopsy** (Ext. 4350).
Liver Biopsy of graft liver for frozen section	Fresh biopsy (dry) Bring to lab immediately	Dry in 60mls container. 30mls container is not suitable.	20 min		Histology	Liver Biopsy Urgent Out of Hours should be arranged through Telephone Switch who will contact the Histopathologist -on-call and a Medical Scientist
Liver Biopsy for quantitative copper / iron analysis	Two samples required: ▪ Fresh dry tissue (no gauze, filter paper or fluid)	Sterile 30ml container (white cap)	15 days		Histology	Contact Histology (Ext 4350) before taking specimen. When specimen is taken deliver to Histology immediately and alert a member of staff. Specimen referred to The Royal Infirmary, Glasgow. Please Do Not Use METAL Forceps on samples for copper / iron analysis, freeze or store at 4°C.

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
	▪ Formalin fixed tissue for histo-pathology diagnosis Bring to lab immediately	10% Formalin in container of adequate size	10 days			
Liver Histology Urgent Post-transplant	Liver tissue	10% Formalin	12 hours minimum		Histology	Contact the laboratory prior to sending sample if required urgently. Liver Biopsy Urgent Out of Hours should be arranged through Telephone Switch who will contact the Consultant-on-call and a Medical Scientist.
Liver Function Tests (LFTs) include albumin, total bilirubin, alkaline phosphatase, GGT & ALT.	Blood	Serum Gold Cap 5mL	4 hours	See under individual tests	Clinical Chemistry	If AST analysis is also required, please state on request form.
Lupus Screen (including DRVVT Ratio and Silica Clotting Time Ratio)	Blood	Sodium Citrate Light Blue Cap x 3 Serum Gold Cap should be sent to Immunology for ACA	4-6 weeks	See Report	Haematology	See comments under Thrombophilia Screen. Sample stability = 4 hrs post collection
Lyme Disease Abs - see Borrelia burgdorferi Abs	Blood	Serum Gold Cap 5mls				
Lymph Node (?Lymphoma)	Fresh tissue (no fixative)	Dry container	15 days		Histology	Delivery to laboratory immediately and hand to a staff member.
Lymphocyte subsets (CD4 and CD8 T cells CD19 and CD20)	Blood	EDTA Lavender Cap 3mls	10 days	T cells 66-85%, Helper T CD4 35-60%, Cytotoxic T CD8+ 18-49%, T cells 797-2996 x10^6/L, Helper T 502-1749 x10^6/L, Cytotoxic T 263-1137 x10^6/L	Immunology	Specimens Referred to Immunology Dept, St. James' Hospital. Please state time of collection on request form. EDTA samples for Lymphocyte subsets should arrive in SJH Immunology within 24 hours of collection. Specimens must be delivered to Immunology before 12:30 pm (Mon - Fri).

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
				B cells CD19 5-19% B cells CD19 99-618 x10^6/L NK cells 4-24% NK cells 72-577 x10^6/L		
Macroprolactin	Blood	Serum Gold Cap 5mL	10 days	See prolactin minus macroprolactin	Clinical Chemistry	See prolactin minus macroprolactin.
Magnesium	Blood	Serum Gold Cap 5mL	4 hours	0.7 - 1.0 mmol/L	Clinical Chemistry	
Urine Magnesium Excretion	Urine - 24h collection	24h urine bottle (plastic) - no preservatives required	Daily Mon – Fri. Same day if rec'd before 11am	3.0-5.0 mmol/24h	Clinical Chemistry	Urine collection bottle and request form must be clearly labelled with patient name and hospital number. The date and time of the start and finish of the 24 hour collection must be clearly indicated. Urine creatinine is added to all urine magnesium requests automatically by IT rule. Urinary volumes are reported in Litres.
Urine Magnesium	Urine - Fresh spot	Sterile Universal Container - 5mL (minimum)	4 hours	Refer to clinical protocol	Clinical Chemistry	Urine creatinine is added to all urine magnesium requests automatically by IT rule.
Malaria Antibodies	Blood	Serum Gold Cap 5mls	10 days	See report	Microbiology Dispatch	Referred to Hospital for Tropical diseases
Malaria Screen	Blood	EDTA Lavender Cap 3mls	2 - 4 hours if negative (24hrs for full screen)	See report	Haematology	Please contact Haematology Laboratory 01-2214657 before taking samples to provide travel history, reason for request, symptoms, details of prophylaxis and any history of malaria infection. Sample stability = 24 hours stored at 4 degrees celcius
Measles Abs	Blood Oral fluid	Serum Gold Cap 5mls Sterile Universal container Oracol collection device (available from NVRL)	8 days	See Report	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin.
Measles PCR	CSF Blood Saliva	Sterile Universal container Serum Gold Cap 5mls Oracol collection device (available from NVRL)	11 days	See Report	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin.
Meningococcal PCR	Blood or CSF	5 mls of EDTA / 6mls or Sterile universal container	Positive results phoned same day 16.00 -17.00	N/A	Microbiology Dispatch	Referred to Irish Meningococcal Ref. Lab. Temple St. Children's' Hosp., Dublin. Samples must be delivered to Microbiology Lab before 11am for

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
		of CSF (see relevant CSF section)	if received before 11am			same day results.
Mercury	Blood or Urine	5 mL of EDTA blood or 10 mL random Urine	15 days	See Report	Clinical Chemistry Dispatch	Referred to Eurofins Biomnis. No pretreatment of urine required.
Metabolic Profile	Blood or Urine	Li-Heparin / 10 mL Urine in universal container	1 week		Clinical Chemistry Dispatch	Referred to Temple St. - please include clinical details for interpretation of results.
Metanephrines (Plasma)	Blood	Lithium Heparin Plasma 5mL	20 days	See Report	Clinical Chemistry Dispatch	Referred to Outside Laboratory (Eurofins Biomnis). Sample must be sent to laboratory immediately and plasma frozen within 1 hour of venepuncture. PRE-TEST DIETARY RESTRICTIONS FOR 48 HOURS PRIOR TO PHLEBOTOMY: avoid consumption of bananas, chocolate, citrus fruit and consume only moderate amounts of tea and coffee.
Metanephrines (Urine Alternative method	Urine - 24h collection	Acidified 24h urine collection - acid containing bottle obtainable from Clinical Chemistry Laboratory * Non-acidified 24h urine collection; 3 x 2 mL aliquots frozen within 48h of start of collection.	15 days 7 days	See Report	Clinical Chemistry Dispatch	Referred to Outside Laboratory (Eurofins Biomnis). Special container with instructions available from Clinical Chemistry. Instructions must be given to patients on the collection of urine into an acid-containing bottle. Warning label 'This bottle contains strong acid preservative' must be attached to bottle. PRE-TEST DIETARY RESTRICTIONS FOR 48 HOURS PRIOR TO URINE COLLECTION: avoid consumption of bananas, chocolate, dried fruits, citrus fruit, avocados, tomatoes, plums, kiwi fruits, pineapples and mollusks. This provides an alternative to the above described requirement for an acidified 24h collection.
Methanol	Blood	Serum red top	1-2 days			Referred to Birmingham, frozen within 4 hours.
Methemoglobin	Arterial or Venous Blood	Pre-heparinised blood gas syringe - 2mL. Ensure no air present.	15 min	See Comment	Clinical Chemistry	The normal fraction of Methemoglobin is <1.5% of the total haemoglobin. Increased levels of Methemoglobin reduce the oxygen carrying and oxygen releasing capacity of haemoglobin. Levels above 10-15% can result in pseudocyanosis. Methemoglobin may cause headache and dysnoea at levels above 30% and may be fatal.
Methotrexate (MTX)	Blood	Serum Red Cap - 6mL - Protected specimen from Light	7 hours	N/A	Clinical Chemistry Dispatch	Methotrexate specimens need to be protected from light. High Dose Methotrexate specimens are referred to St James's Hospital. From Mon - Fri. 9am - 6pm specimens are dispatched from Clinical Chemistry. Dosage and time taken to be written on request form. Contact Clinical Chemistry in advance if 'urgent' high dose sample needs to be sent out. **Out of Hours** Samples - (protect from light) are sent to St. James Hospital by the

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
						ward. Notify St. James Hospital before sending samples. Give contact number so St James' can phone results. All Methotrexates are sent to St James Hospital.
Methylmalonic Acid (MMA)	Blood	Serum	1 month			Frozen < 1h (within an hour of collection)
Microfilaria detection	Blood	Sodium citrate blood (state time taken)	12 days	N/A	Microbiology Dispatch	Referred to Hospital for Tropical Diseases, London
Mismatch repair Immunohistochemistry (MSI)	Tissue / cytology		7 days		Histology	Phone requests to immunohistochemistry lab Ext 4797
Molecular Solid tumour testing (in house test) NGS Panels: Breast, Cholangiocarcinoma, Colorectal, GIST, Lung, Melanoma, Oncomine Focus Assay Full Panel, Pancreatic, Urothelial	Tissue	N/A	20 days	N/A	Histology	To request test contact reporting Histopathology Consultant. Molecular laboratory (ext. 3337) or Histology (ext. 4613) For queries.
Molecular Solid tumour testing (external test) ALK-FISH, BRCA, COL1A2-PDGFB fusion FISH, EWSR1 FISH, MDM2 FISH, MLH1-Promoter hypermethylation,	Tissue	N/A	15-45 days depending on request and referral centre	N/A	Histology	To request test contact reporting Histopathology Consultant. Molecular laboratory (ext. 3337) or Histology (ext. 4613) For queries. Referred to external centres including Belfast City Hospital, Beaumont Hospital Molecular Lab, CMD Lab St James Hospital, Manchester Centre for Genomic Medicine, Histology Lab CHI Crumlin and Royal National Orthopaedic Hospital Stanmore. NOTE: For BRCA test requests sent to CMD and Beaumont Hospital, a BRCA Test Request and Consent form must be completed by clinician and patient. Contact Lab for form.

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
MSI PCR, Solid tumour cancer panels (e.g. extended NGS lung panel, Oncomine), TCR Gene Rearrangements, TX18 translocation studies, USP6-MYH9 RT-PCR.						
Mouth swab	Mouth swab	Bacterial Transport Swabs	48 hrs - 96 hrs	N/A	Microbiology	
MRSA Screen Culture for MRSA	Nasal Swab Groin Swab	Bacterial Transport Swabs	48 hrs - 96 hrs	N/A	Microbiology	Investigation of carriage of MRSA. .
Myeloproliferative Panel (MPN)	Peripheral Blood / Bone Marrow	EDTA / BMA in PMI	28 Days	See report	Haematology Referral	Sent to CMD in St James Hospital. Specify which tests of the MPN panel are required in the request form.
Myositis panel	Blood	Serum Gold Cap 5mls	14 days	See report	Immunology	Specimens referred to Eurofins Biomnis. These antibodies are associated with polymyositis, Raynaud's phenomenon, lung fibrosis, articular pain and palm hyperkeratosis.
Mumps Abs	Blood Oral fluid	Serum Gold Cap 5mls Sterile Universal container Oracol collection device (available from NVRL)	9 days	See Report	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin.
Mumps PCR	CSF Oral fluid Urine Throat swab	Sterile Universal container Viral swab- (ORACOL swab required) Contact microbiology lab	11 days	See Report	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin. ORACOL swabs are required. Please contact microbiology lab If mumps is required on a CSF sample, relevant clinical details must be supplied
Muscle Enzyme Histochemistry	Skeletal muscle biopsy	In Saline-moistened gauze	10 days		Histology	Referred to Beaumont Neuropathology Department. Muscle Biopsies for Histochemistry must be booked early by phoning Histology (Ext: 4350 or 4330), as these are transported to Beaumont Hospital on the day taken.

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
						Bring to the laboratory immediately. SVPH arrange their own transport.
Mycobacteria – see TB specimens						
Mycology Specimens (Superficial) Microscopy & Culture **(In house)**	Skin / Hair/ Nails	Sterile Universal Container	Microscopy: 3-10 days Fungal Culture: 3-5 weeks	N/A	Microbiology	All significant positive results are phoned to the team/ clinician when confirmed. Use Yellow microbiology form
Mycology Specimens (Superficial) Microscopy & Culture (GP patients)	Skin / Hair/ Nails	Sterile Universal Container	Microscopy: 3-10 days Fungal Culture: 3-5 weeks	N/A	Microbiology Dispatch	Specimens Referred to Eurofins Biomnis. Use GP request form
Mycology Specimens (other than superficial) Microscopy & Culture	Specimens other than skin / hair/ nails	Sterile Universal Container	Microscopy: 3-5 days Fungal Culture: 48h-10 days	N/A	Microbiology	All significant positive results are phoned to the team/ clinician when confirmed. Use Yellow microbiology form
Mycophenolate (Cellcept)	Blood	EDTA Lavender Cap 3mls	28 days		Immunology	Specimens Referred to Harefield Hospital (UK). **Bring samples to the laboratory as soon as possible. Plasma must be separated within 24 hrs. Note: requests for Mycophenylate measurement must be approved by consultant hepatologist
Mycoplasma hominis /Ureaplasma screen	Urine	Specific Aptima collection devices required.	7 days	N/A	Microbiology Dispatch	If Chlamydia trachomatis, *N. gonorrhoeae* , *M. hominis/Ureaplasma* or *Trichomonas vaginalis* is suspected please contact the NVRL (external patients) or Microbiology department (in-patients) for Aptima collection devices. These samples are referred to National Virus Reference Laboratory University College Dublin.
Mycoplasma hominis / Ureaplasma Abs	Blood	Serum Gold Cap 5mls refrigerated	8 days	See Report	Microbiology Dispatch	Referred to Eurofins Biomnis.

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Mycoplasma pneumonia Abs	Blood	Serum Gold Cap 5mls	7 days	See Report	Microbiology Dispatch	Referred to Eurofins Biomnis.
Mycoplasma pneumonia PCR	CSF Respiratory samples	Sterile Universal container	7 days	N/A	Microbiology Dispatch	Referred to Eurofins Biomnis. Sample should be sent frozen.
Myoglobin		See Comment. Urinary Myoglobin – not available.				Total CK is a more useful indication of Rhabdomyolysis.
Nasal Swab Culture	Nasal Swab	Bacterial Transport Swab	48-96 hrs	N/A	Microbiology	Investigation of nasal carriage of S.aureus & MRSA.
Neisseria gonorrhoeae PCR	Swab Urine	Specific Aptima collection devices required.	7 days	N/A	Microbiology Dispatch	If Chlamydia trachomatis, *N. gonorrhoeae* or *Trichomonas vaginalis* is suspected please contact the NVRL (external patients) or Microbiology department (in-patients) for Aptima collection devices. These samples are referred to National Virus Reference Laboratory University College Dublin.
Next Genome Sequencing (NGS) for Myeloid malignancy	Bone Marrow or Peripheral Blood	BM in RPMI or PB in EDTA	4-6 weeks	N/A	Haematology Referrals- Outsourced to CMD in St James Hospital	CMD request form must be completed, available on the CMD website and in the SVUH Haematology Laboratory.
Nerve Biopsy	Sural nerve biopsy	In Saline-moistened gauze	3-4 weeks		Histology	Muscle Biopsies for Histochemistry must be booked early by phoning Histology (Ext: 4350 or 4330), as samples are transported to Beaumont Hospital on the day taken. Bring to the laboratory immediately. SVPH arrange their own transport.
Neurokinin	Blood	EDTA Lavender Cap 3mL frozen within an hour.	4 - 6 weeks		Clinical Chemistry Dispatch	Plasma must be frozen within one hour. Specimens referred to: Dr. Joy Ardill, Regulatory Peptide Lab, 2nd Floor Kelvin Building, Royal Victoria Hospital, Belfast BT12 6BA
Urine Nitrogen Excretion	Urine - 24h collection	24h urine bottle - (plastic). No preservatives required	Daily (Mon-Fri)	7-10 g/24h in stable non-catabolic state. Up to 20-30 g/24h following major surgery or trauma.	Clinical Chemistry	Urine collection bottle and request form must be clearly labelled with patient name and hospital number. The date and time of the start and finish of the 24 hr collection must be clearly indicated.
Norovirus PCR	Faeces	Sterile Universal container	9 days	N/A	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin
NT-proBNP	Blood	Serum Gold Cap 5mL	Mon-Fri within 2	see comments	Clinical Chemistry	ESC Heart Failure(HF) Guidelines (2008)

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
(N-terminal pro B Natriuretic Peptide)			routine working days Note: GP samples received on Friday may not be analysed until Monday (Tuesday following a Bank Holiday weekend).			In Untreated Patients with symptoms suggestive of HF:- NT-proBNP < 400 pg/mL indicates chronic HF is unlikely NT-proBNP between 400 and 2000 pg/mL is equivocal NT-proBNP > 2000 pg/mL indicates chronic HF is likely. Age related Reference Intervals, 95th percentile age related upper limits in subjects without known cardiac risks, symptoms or history are: 18-44 y: 97 pg/mL 45-54 y: 121 pg/mL 55-64 y: 198 pg/mL 65-74 y: 285 pg/mL ≥ 75 y: 526 pg/ml Biotin may cause some concentration-dependent negative interference in this assay if high dose supplements are taken. If this is suspected, a repeat request 8 plus hours off Biotin is recommended in the first instance. Be aware that: * obesity, African or African-Caribbean family origin, or treatment with diuretics, angiotensin-converting enzyme (ACE) inhibitors, beta-blockers, angiotensin II receptor blockers (ARBs) or mineralocorticoid receptor antagonists (MRAs) can reduce levels of serum natriuretic peptides. * high concentrations of serum natriuretic peptides can have causes other than heart failure (for example, age over 70 years, left ventricular hypertrophy, ischaemia, tachycardia, right ventricular overload, hypoxaemia [including pulmonary embolism], renal dysfunction [eGFR less than 60 ml/minute/1.73m^2], sepsis, chronic obstructive pulmonary disease, diabetes or cirrhosis (of the liver). Please contact the Duty Scientist on Ext 3127 for further details. In untreated patients with symptoms suggestive of heart failure (HF) an NT-proBNP <250 pg/mL indicates chronic HF is unlikely. In the setting of values below the upper recommended medical action limit, if a clinical suspicion of HF persists consult with cardiology re need for echocardiography (Note: values taken while on diuretics or in patients with BMI >30 can result in lower NT-proBNP values than anticipated).
Osteocalcin	Blood	Serum Gold Cap 5mL	4 Weeks	Female: 11.0 – 43.0 ug/L Male: 14.0 – 42.0 ug/L	Clinical Chemistry	Fasting specimen required. Part of Bone Biomarker. Protocol available from Lab. Biotin may cause some concentration dependent negative interference in this assay if high dose supplements are taken. If this is suspected, a repeat request 8 plus hours off Biotin is recommended in the first instance.

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
						Please contact the Duty Scientist on Ext 3127 for further details.
Oestradiol	Blood	Serum Gold Cap 5mL	Daily Mon-Fri	Male: 50-159 pmol/L, Female: Follicular 114-33 pmol/L, Mid Cycle 222-1959 pmol/L, Luteal 222-854 pmol/L, Post Menopause <505pmol/L	Clinical Chemistry	State LMP. Where patients are undergoing assisted reproduction, the Lab must be contacted prior to commencing the procedure if oestradiol levels are required urgently and/ or outside routine opening hours. A mobile contact number for the clinician must be provided. Oestradiol results >5000pmol/l are phoned in such instances. Biotin may cause some concentration dependent positive interference in this assay if high dose supplements are taken. If this is suspected, a repeat request 8 plus hours off Biotin is recommended in the first instance. Please contact the Duty Scientist on Ext 3127 for further details. In women aged 45 years and over presenting with menopausal symptoms, the diagnosis of perimenopause or menopause should be considered based on their symptoms alone, without confirmatory blood tests unless uncertainty about the diagnosis. In women under the age of 45 years presenting with menopausal symptoms, elevated gonadotropins (FSH >30 IU/L) should be looked for on at least two occasions measured four to six weeks apart. Laboratory monitoring of oestrogen replacement is neither mentioned in best practice nor recommended.
Oestrogen Receptor	Breast or Lymph node (other tissue can also be used)	Paraffin processed tissue	7 days		Histology	Phone requests to Immunohistochemistry lab Ext.4797
Oligoclonal Banding (Isoelectric focusing)	CSF (see relevant section for information on CSF) & Blood	CSF and Serum Gold Cap 4.5mls	10 days	CSF Albumin 150-350 mg/L CSF IgG 10-35 mg/L IgG Index 0-0.7 Serum Albumin 35-52 g/L Serum IgG 7-16 g/L CSF IgG Pattern: Normal isoelectric focusing pattern.	Immunology	Specimens referred to Eurofins Biomnis. CSF must be accompanied by serum sample taken at the same time (or within 24 hours), and sent with an Immunology request form. Oligoclonal bands are found in the CSF of 80-90% of patients with multiple sclerosis but may also be found in other infectious/inflammatory disorders of the central nervous system

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Oncotype DX	Tissue	Paraffin processed tissue	14-21 days	N/A	Histology	To request test phone Immunohistochemisty Lab (ext.4797). Referred to Genomic Health Inc.
Orexin/Hypocretin	CSF (see relevant section for information on CSF)	CSF (2 mL)	6-8 weeks	Using this assay, values >200pg/ml are seen in healthy controls. Values of <110pg/ml are mainly seen in patients with narcolepsy with cataplexy. Values between 110-200pg/ml can be seen in patients with other neurological diseases associated with sleep disturbances.	Immunology	Specimens Referred to Immunology, Oxford University Hospital (UK). Orexin/hypocretin is a CSF peptide that is severely reduced or absent in narcolepsy with cataplexy (*Andalauer et al. 2012 Sleep*). This is a commercially available test (Phoenix Pharmaceuticals) that measures the Orexin levels that can aid in the clinical investigations of a patient with possible narcolepsy with cataplexy.
Osmolality (serum)	Blood	Serum Gold Cap 5mL	Daily	275 - 295 mmol/kg	Clinical Chemistry	
Osmolality (urine)	Urine - Spot	Universal Container	Daily	N/A	Clinical Chemistry	Interpretation of urine osmolality is dependent on fluid, electrolyte balance and renal function.
Osmotic Fragility Test – see EMA binding test	Blood	EDTA 3 mls	5 days	See final report	Haematology	Test useful in patients with query Hereditary Spherocytosis. Samples sent to Crumlin Haematology Laboratory.
Oxalate	Urine - 24h collection	24 hour urine bottle - no additive	20 days	4.0 - 31.0 mg/24 h	Clinical Chemistry Dispatch	Referred to Eurofins Biomnis. Part of stone screen. The date and time of start and finish of collection must be clearly indicated.
P1NP (Total Procollagen Type 1 N-Propeptide)	Blood	Serum Gold Cap 5mL	4 Weeks	22.1 – 96.1 ug/L	Clinical Chemistry	Part of Bone Biomarker Profile. Sample Collection protocol available from laboratory. Biotin may cause some concentration dependent negative interference in

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
						this assay if high dose supplements are taken. If this is suspected, a repeat request 8 plus hours off Biotin is recommended in the first instance. Please contact the Duty Scientist on Ext 3127 for further details. Reference intervals for females taken from Eastell R et al. Reference intervals of bone turnover markers in healthy premenopausal females; results from a cross sectional European study. Bone 2012 May; 50(5):1141-7 Reference intervals for males taken from Roche internal data.
Paracetamol (acetaminophen)	Blood	Serum Gold Cap 5mL	90 minutes	See Comments. State time of ingestion on form if known.	Clinical Chemistry	For interpretation following a single acute ingestion, refer to new paracetamol nomogram. Toxicity is related post-dose interval typically: >100mg/L at 4 hrs, >50mg/L at 8 hrs and if paracetamol is detected 15hrs or more hours post ingestion. Please refer to SVUH Oral Paracetamol Overdose Integrated Care Pathway for Adults (Effective from 14/11/2012). Lower Paracetamol levels are used if patient is higher risk. The time of ingestion should be stated on the request form (if known), together with the date and time of specimen collection. Specimens taken less than 4 hrs post ingestion are not considered useful for prediction of toxicity. Samples must be analysed within 24 hours of collection. Paracetamol levels are not appropriate for the assessment of chronic use. Please be aware that high concentrations of N-Acetylcysteine and the Acetaminophen metabolite N-acetyl-p-benzquinone imine (NAQPI) independently may cause falsely low Creatinine results.
Parainfluenza 1,2,3,4 – see respiratory virus screen	Sputum, NPA, throat wash, respiratory secretions	Sterile Universal container	7 days in season 9 days out of season	See Report	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin
Parathyroid Hormone (PTH)	Blood	Serum Gold Cap 5mL	Daily Mon-Fri	1.8 – 6.3 pmol/L	Clinical Chemistry	Specimens should be delivered to the laboratory as soon as possible post venepuncture. If same day delivery is not possible serum must be separated and frozen. For PTH requests originating in St Michaels' Hospital, please ensure a separate sample is taken for PTH as this test is referred to St Vincent's University Hospital for analysis. PTH reference interval reference ranges (2.5th-97.5th percentile) were determined in apparently healthy adults with measured 25OHD in the range 50-75 nmol/L (20-30 ng/ml)

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Parathyroid -related Peptide Hormone (PTHrP)	Blood	K EDTA + Aprotinin Pink Cap* / 2 x 5mL	3-4 weeks	less than 1.8 pmol/L	Clinical Chemistry Dispatch	*Specimen containers available from Phlebotomy. Do not mix up with Cross Match Tube. Send sample to lab immediately. Referred to Eurofins Biomnis.
Parvovirus B19 Abs	Blood	Serum Gold Cap 5mls	7 days	See Report	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin
Parvovirus B19 PCR	Blood	EDTA Lavender Cap 3mls	9 days	N/A	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin
Peritoneal Fluid for tumour	20 ml Fresh sample	Universal/20mls	5 days		Cytology	Large volume of fluid received in drain bags not suitable.
Peth	Blood	2 EDTA Lavender Cap-3mls	6 – 8 days		Clinical Chemistry Dispatch	Available for Liver Team Only
PD-L1 (SP263) NSCLC	Tissue/ Cytology		10 days	TPS (Tumour Proportion Score) ≥50% (positive)	Histology	Phone requests to Immunohistochemistry Lab (ext. 4797)
PD-L1 (22C3) Urothelial Cancer Cervical Cancer	Tissue/ Cytology		10 days	CPS (Combined Positive Score) Urothelial: ≥10 Cervical: ≥1	Histology	Phone requests to Immunohistochemistry Lab (ext. 4797)
PD-L1 (SP142) Triple Negative Breast Cancer (TNBC)	Tissue/ Cytology		10 days	≥1% IC (immune cells), positive	Histology	Phone requests to Immunohistochemistry Lab (ext. 4797). Requests are sent to Poundbury Cancer Institute.
PFA 100 Test	Blood	Sodium Citrate x 2, EDTA 3mls	4 hrs	See Report	Haematology Referrals	Must be delivered to laboratory. Do NOT use POD. Screening Test only - further Platelet Aggregation/Function assays are referred to St. James's Hospital. Sample stability = 4hrs post collection.
pH (Blood)	Blood	Pre-heparinised blood gas syringe - 2mL	15 min	pH 7.35 - 7.45	Clinical Chemistry	See Arterial Blood Gas
pH (fluid)	Pleural fluid	For pH; minimum of 1 mL should be transferred immediately to an ABG heparinised syringe with all air expelled. Immediately bring to Biochemistry.	Daily	N/A	Clinical Chemistry	The source of the fluid must be stated on the request form. The collection time of the fluid must be stated on the request. All effusions should be accompanied by a paired serum sample. Ideally analyse within 1 hour of collection. Non-viscous pleural fluids can have pH determined from ward based blood gas analysers using

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
						appropriate heparinised syringes.
Phenobarbitone	Blood	Serum Red Cap - 6mL	7 days	10 - 30 mg/L	Clinical Chemistry Dispatch	Referred to Outside Laboratory (Beaumont Hospital). Specimens must be received into laboratory before 12.00 for same day dispatch.
Phenytoin	Blood	Serum Gold Cap 5mL	Daily	Therapeutic Range: 10 - 20 mg/L	Clinical Chemistry	The therapeutic range given is a guide only; individual patient responses may vary and patients may exhibit toxic symptoms within reference range. Samples must be analysed within 24 hours of collection.
Phosphate (Inorganic PO_4)	Blood	Serum Gold Cap 5mL	4 hours	Adults 0.8 - 1.5 mmol/L	Clinical Chemistry	Levels in children (2-12 years) are higher.
Urine Phosphate Excretion	Urine - 24h collection	Spot Urine 24h urine bottle (plastic) - no preservatives required	Daily (Mon-Fri)	Early morning Urine Sample 13-44 mmol/l Or 13-42 mmol/24h	Clinical Chemistry	Urine collection bottle and request form must be clearly labelled with patient name and hospital number. The date and time of the start and finish of the 24 hr collection must be clearly indicated. Urine creatinine is added to all urine phosphate requests automatically by IT rule. Urinary volumes are reported in Litres.
Urine Phosphate	Urine - Fresh spot	Sterile Universal Container - 5mL (min)	4 hours	Refer to clinical protocol	Clinical Chemistry	Urine creatinine is added to all urine phosphate requests automatically by IT rule.
Plasma Viscosity	Blood	EDTA Lavender Cap 3mls X 2	24 hours	See Report	Haematology Referred	Sample must not be stored in fridge - samples are sent St. James's Hospital. Plasma should be separated and stored at room temperature if taken over weekend.
Platelet Allo antibodies	Blood	Serum Gold Cap	5 days	See Report	Haematology Referred	Referred to National Blood Centre. Samples must be received into laboratory before 11.30 for same day dispatch.
Platelet Function/Aggregation Studies	Blood	Sodium Citrate x 5		See Report	Haematology Referred	Referred to Coagulation Lab, NCHCD, St. James. Testing must be pre-arranged by phoning clinical team at 416 2142. Samples must be received by 4pm.
Pleural Fluid for tumour	20ml Fresh sample	Universal / 20mls	5 days		Cytology	Large volume of fluid received in drain bags not suitable.
PM Sample (Toxicology)	Urine	Universal Container	4 months	N/A	Clinical Chemistry Dispatch	Referred to Outside Laboratory (Beaumont Hospital).

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Pneumococcal Abs See Specific Antibody Response to Pneumococcal Capsular Polysaccharide						
Pneumococcal PCR	Blood or CSF	EDTA / 6mls or CSF (see relevant section)	Positive results phoned same day 16.00-17.00 if received before 11.00	N/A	Microbiology Dispatch	Referred to IMMRL, Temple St. Children's' Hosp , Dublin.
Pneumococcal Urinary Antigen	Urine	5-10ml	24 hrs Mon-Fri	N/A	Microbiology	Part of screen for Community-acquired pneumonia.
Pneumocystis jiroveci (previously carinii) PCP	Fresh Broncho Alveolar Lavage (BAL)	Large Sterile Container/ amount available	Results faxed next working day	N/A	Microbiology Dispatch	Referred to Micropathology Ltd., Warwick Lab must be informed in advance if test required urgently- Sputum not suitable.
PNH screen	Blood	EDTA Lavender Cap 3mls X 2	48 hours	See final report	Haematology Referred	Samples must be fresh. This replaces the Ham's test. Please make arrangements with Immunophenotyping laboratory (ext.4792) before taking sample. Samples referred to Immunophenotyping Laboratory, SJH.
Porphobilinogen (PBG)	Urine - 24h collection (Spot urine if emergency request)	24h urine bottle (plastic) - no preservatives required - Protect from light at all times	15 days	24h collection: <16 umol/24h Random Urine: <1.5 umol/mmol creatinine	Clinical Chemistry Dispatch	Referred to Outside Laboratory (St James's Hospital). Specimens must be received into laboratory before 12.00 for same day dispatch. Protect specimen from light at all times.
Porphyrins (blood)	Blood	EDTA x2, Lithium Heparin x1 Protected from light at all times	15 days		Clinical Chemistry Dispatch	* If patient presents with symptoms of an acute attack, please forward a random urine to SJH and follow ASAP with other three samples (blood, urine, faeces). Referred to Outside Laboratory (St James's Hospital). Specimens must be received into laboratory before 12.00 for same day dispatch. Protect specimen from light at all times.
Porphyrins (faeces)	Faeces	Universal container - 10g - Protected from light at all times	6 weeks		Clinical Chemistry Dispatch	Referred to Outside Laboratory (St James's Hospital). Specimens must be received into laboratory before 12.00. Full clinical history required. Protect specimen from light at all times.
Posaconazole levels	Blood	Serum Gold Cap 5mls	14 days	See Report	Microbiology Dispatch	Referred to PHE Mycology Reference Laboratory, Bristol

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Porphyrins (urine)	Urine - 24h collection	24h urine bottle (plastic) - no preservatives required - Protect from light at all times	15 days		Clinical Chemistry Dispatch	Referred to Outside Laboratory (St James's Hospital). Specimens must be received into laboratory before 12.00 for same day dispatch. Protect specimen from light at all times.
Potassium	Blood	Serum Gold Cap 5mL	4 hours	3.5 - 5.3 mmol/L	Clinical Chemistry	Bring to laboratory as soon as possible - elevated values can occur if separation of plasma from blood cells is delayed. Do not refrigerate whole blood. Do not take blood from a limb with an IV Potassium Infusion. If there is >8 h between collection and sample receipt/separation the sample will be deemed unsuitable for potassium measurement. If the K >6 mmol/L and the H index is low (for K ≤54 umol/L, not reported on specimens used as internal quality assurance of the specimen) magnesium, phosphate, calcium, albumin and ALP are automatically tested by IT rule (this endeavours to determine if sample is contaminated). For GP samples Potassium must be specifically requested on the new GP Form and time and date of collection must be specified.
Urine Potassium Excretion	Urine - 24h collection	24h urine bottle (plastic) - no preservatives required	Mon - Fri Same day if received before 11am	20 - 125 mmol/24h	Clinical Chemistry	Urine collection bottle and request form must be clearly labelled with patient name and hospital number. The date and time of the start and finish of the 24 hour collection must be clearly indicated. Urine creatinine is added to all urine potassium requests automatically by IT rule. Urine volumes are reported in Litres.
Urine Potassium	Urine - Fresh spot	Sterile Universal Container - 5mL (min)	4 hours		Clinical Chemistry	Urine creatinine is added to all urine potassium requests automatically by IT rule. Urine potassium requests will also have chloride and sodium measured automatically by IT rule.
PRA Renin/Aldosterone Ratio	Blood	2 x 3 mL EDTA Lavender Cap tubes on ice 1x serum yellow top	20 days	Upright: 0.5 - 5.3 ng/mL/h	Clinical Chemistry	Referred to Eurofins Biomnis Send samples on ice to laboratory immediately. Indicate posture. Aldo/PRA ratio 20-750.
Pregnancy test (see hCG)					Clinical Chemistry	
Pressure sore swab for C/S	Pressure sore swab	Transport swab	48-96h	N/A	Microbiology	
Procalcitonin	Blood	Serum Gold Cap 5mL	24 hours	<0.06: No systemic inflammatory reaction	Clinical Chemistry	PCT tests may be useful in identifying whether there is a bacterial infection, especially severe sepsis and septic shock and is considered as a

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
				0.06 - <0.5: Measurable but low systemic inflammatory reaction 0.5 - < 2.0: Significant but moderate systemic inflammatory reaction 2.0 - <10.0: Systemic infection is likely unless other causes are known 10 - >100: Indicates an important systemic inflammatory response		prognostic marker to support outcome prediction in sepsis patients. In addition, PCT has been proposed as a guide for the decision of antibiotic treatment necessity and to determine treatment duration in patients suffering from community-acquired respiratory tract infections or ventilator-associated pneumonia. In acute pancreatitis PCT has also been found to be a reliable indicator of severity and of major complications. It is not advised to recheck PCT concentrations until at least 6 hours have passed since the previous sampling. Please contact the Duty Scientist on Ext 3127 for further details.
Procollagen Type III Amino Peptide	Blood	2 X Serum separated & frozen	2 months - batched analysis; dispatched weekly	1.7 - 4.2 µg/L	Clinical Chemistry Dispatch	Referred to Outside Laboratory (Manchester Royal Infirmary). Specimens must be received into laboratory before 12.00 for same day dispatch.
Progesterone	Blood	Serum Gold Cap 5mL	Daily Mon-Fri	Mid Luteal > 20nmol/L	Clinical Chemistry	State LMP. Biotin may cause some concentration dependent positive interference in this assay if high dose supplements are taken. If this is suspected, a repeat request 8 plus hours off Biotin is recommended in the first instance. Please contact the Duty Scientist on Ext 3127 for further details.
Progesterone Receptor	Breast or Lymph node (other tissue can also be used)	Paraffin Processed tissue	7 days		Histology	Phone requests to Immunohistochemistry lab 4797.
Total Prolactin	Blood	Serum Gold Cap 5mL	Daily Mon-Fri	Female: 102 - 496 mIU/L, Male: 86 - 324 mIU/L	Clinical Chemistry	Biotin may cause some concentration dependent negative interference in this assay if high dose supplements are taken. If this is suspected, a repeat request 8 plus hours off Biotin is recommended in the first instance. Please contact the Duty Scientist on Ext 3127 for further details. Causes of an elevated prolactin include: 1. Physiological (stress, pregnancy, breastfeeding) 2. Medication (dopamine antagonists, reserpine, oestrogen) 3. Chronic renal impairment, Hypothyroidism 4. Macroprolactin 5. A prolactin secreting pituitary adenoma. The Endocrine Society recommends serum prolactin measurements are not carried out in pregnant patients with prolactinomas. Do not include in "Routine Bloods", health-screening requests, or in the absence of relevant symptoms.

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
						https://www.hse.ie/eng/about/who/cspd/ncps/pathology/resources/lab-testing-for-hyperprolactinaemia.pdf
Prolactin minus Macroprolactin	Blood	Serum Gold Cap 5mL	10 days	Female: 75 - 381 mIU/L Male: 63 - 245 mIU/L.	Clinical Chemistry	
Total Protein	Blood	Serum Gold Cap 5mL	4 hours	60 - 80 g/L	Clinical Chemistry	Calculated Globulin is reported where serum Albumin and serum Total Protein are measured. Calculated Globulin Reference Interval = 25 to 40 g/L
Protein C	Blood	Sodium Citrate Light Blue Cap 3 mls	Routine: 4-6 weeks 6 hours - urgent	74 - 132 IU/dl	Haematology	Tests done in batches as part of the Thrombophilia screen every 6-8 weeks, unless requested urgently. Sample stability = 4 hrs post collection.
Protein S (Free)	Blood	Sodium Citrate Light Blue Cap 3 mls		Female (65 – 133) U/dl Male (76 – 146) U/dl	Haematology	Tests done in batches as part of the Thrombophilia screen every 6-8 weeks, unless requested urgently. Sample stability = 4hrs post collection.
Urine Protein:Creatinine Ratio	Urine	Random urine specimen, Early Morning if possible	Mon - Fri Same day if received before 11am	3 - 14 mg/mmol	Clinical Chemistry	UPCR > 45mg/mmol should be considered positive for proteinuria, although lower levels may be significant in the concomitant presence of haematuria. Diagnosis of persistent proteinuria requires 2 or more positive tests, one to two weeks apart. UTI should always be out ruled in a positive sample as this can lead to a false positive result. Urinary volumes are reported in Litres.
Protein Electrophoresis - Urine – detection of Bence Jones Protein or BJP	Urine - fresh spot	Sterile universal container – 20 mL	2 weeks	Qualitative Reporting	Immunology	Specimens with significant blood content are unsuitable for analysis. Detection of BJP/ monoclonal free kappa or free lambda chains is carried out by urine immunofixation electrophoresis in Immunology. BJP is quantified by calculating total protein in 24-hour urine and using urine electrophoresis densitometry to quantify the BJP present.
SPEP - Serum Protein Electrophoresis	Blood	Serum Gold Cap - 5mL	7 days	60-85 g/L (Total Protein) Qualitative reporting for all other fractions. Quantitation of Paraprotein level (where applicable).	Clinical Chemistry	Protein Electrophoresis for monoclonal bands. N.B: Serum specimen essential. Give full clinical details. Depending on the results of the electrophoresis, specimens may be sent for immunofixation.
Urinary Protein Excretion	Urine - 24h collection	24h urine bottle (plastic) - no preservatives required	Mon - Fri Same day if received before 11am	<0.15 g/24h	Clinical Chemistry	Urine collection bottle and request form must be clearly labelled with patient name and hospital number. The date and time of the start and finish of the 24 hour collection must be clearly indicated.

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
						Urine creatinine is added to all urine protein requests automatically by IT rule. Urine volumes are reported in Litres. Please note: Haemoglobin and/or Homogentisic Acid in the Urine will cause a positive Interference. Haemolysed samples are unsuitable for serum protein electrophoresis (SPEP). In cases where in vivo haemolysis is suspected, please contact the laboratory.
Prothrombin Mutation or PT 3' UTR	Blood	EDTA Lavender Cap 3 mls	21 days	See Report	Haematology Referred	Referred to Eurofins Biomnis. A separate EDTA sample must be taken for this test. A patient consent form **must** be filled out. Sample should not be opened prior to dispatch.
Prothrombin Time	Blood	Sodium Citrate Light Blue Cap 3 mls	Urgent 1.5hr Routine 4hrs GP – 2 working days	See report	Haematology*	One sample sufficient for PT, INR, APTT, APTT Ratio, D-Dimers, Fibrinogen. Sample stability = 24 hrs post collection.
PSA (Free) (FPSA)	Blood	Serum Gold Cap 1mL Frozen	7-10 days	See Report	Clinical Chemistry	Disptached to St James Hospital. The free PSA is expressed as a ratio of the total PSA present in the specimen.
Total PSA	Blood	Serum Gold Cap 5mL	Daily (Mon-Fri)	Age Related: <50 y: <2 ug/L 50-59 y: <3 ug/L 60-69 y: <4 ug/L ≥70 y: <5 ug/L	Clinical Chemistry	The NCCP Prostate Cancer GP Referral Guidelines advise the use of the same laboratory for repeat PSA tests. Variation in PSA results may be explained by the use of different assay methods in hospital laboratories.Method Used: Roche Immunoassay. As well as prostate cancer, PSA may be elevated in patients with UTIs, BPH, prostatitis or following manipulation of the prostate, e.g. after needle biopsy. The role of PSA in prostatic cancer screening is controversial. Biotin may cause some concentration dependent negative interference in this assay if high dose supplements are taken. If this is suspected, a repeat request 8 plus hours off Biotin is recommended in the first instance. Please contact the Duty Scientist on Ext 3127 for further details.
Pus	Pus	Usually in a Sterile Universal Container	48-96h	N/A	Microbiology	TAT can be extended to 8 days to allow for enrichment

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Pyruvate Kinase	Blood	ACD Whole blood 5mls	8 days	See Report	Haematology Referred	Referred to Eurofins Biomnis.
Q Fever / Coxiella Abs	Blood	Serum/ 5-10ml	5 days	N/A	Microbiology Dispatch	Referred to HPA Bristol.
Quantiferon	Blood	Special containers available from Microbiology Lab. Hand Deliver to Microbiology Lab at room temperature as soon as possible post venepuncture Samples must not be refrigerated. Date and time of sampling must be recorded.	18 days	See Report	Microbiology Dispatch	Hand Deliver to Microbiology Lab at room temperature as soon as possible post venepuncture Samples are referred to the TB Laboratory in the Mater Hospital. Samples must be received before 14:30. Tubes are incubated in SVUH for 16-24 hours and centrifuged prior to transporting to the Mater. Please do not send on Friday where possible. Phlebotomy will NOT take bloods for Quantiferon testing on Fridays, please ensure patients are aware of this and do not book appointment on Fridays. Please contact Microbiology Lab for relevant request form and sample containers.
Red Cell Transketolase	Blood	NA	NA	NA	Haematology referred	No Longer available. Preferable to measure Vitamin B1 (Thiamine)
Renal Biopsy: For tumour diagnosis only	Renal biopsy tissue	10% Formalin in container of adequate size	5 days		Histology	Histology tissues (routine) must be fixed (in 10% formalin) immediately in containers of adequate size. The volume of fixative should be at least ten times the volume of the tissue. Please phone laboratory prior to sending **urgent biopsy** (Ext. 4350).
Renal Biopsy • Fresh renal cortex	Needle Biopsy	Tissue in a small amount of Saline (30 ml universal container)	15 days	NA	Histology	Contact the Histology Laboratory (Ext 4797 or 4350) before taking biopsy samples. Bring fresh specimen to histology lab immediately and give to staff member to check sample adequacy before leaving the laboratory.
• Renal phosphate (PO4) threshold (TmP)	Blood	Serum Red Cap 6mL	4-6 weeks		Clinical Chemistry	Fasting specimen required, part of Bone Biomarker Profile Protocol available from Lab.
Renal phosphate (PO4) threshold (TmP)	Urine	2 hour timed morning collection, bottle available in Lab.	4-6 weeks	0.84 - 1.48 mmol/L	Clinical Chemistry	Fasting specimen required, part of Bone Biomarker Profile Protocol available from Lab.

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Renal Profile (Urea/Electrolytes). Includes urea, creatinine, sodium, potassium, chloride.	Blood	Serum Gold Cap 5mL	4 hours	See under individual tests	Clinical Chemistry	NB: Do not take blood from a limb with an IV Infusion. Do not place whole blood specimen for Potassium analysis in fridge.
Renin See PRA Plasma Renin Activity						
Retinol Binding Protein RBP	Blood	Serum	2 days	See report	Clinical Chemistry Dispatch	Serum refrigerated Usually measured in conjunction with Vitamin A
Respiratory Virus Screen (PCR) Includes SARS-CoV-2, Influenza A,B, Parainfluenza 1-4, RSV, Adenovirus, Human Metapneumovirus, Chlamydia pneumophila and Mycoplasma pneumoniae	Throat swab, Naso-pharyngeal swab aspirate BAL	Viral swab (liquid UTM – red top container) Sterile Universal container for aspirate or BAL	7 days in season 9 days out of season Positive results are phoned to Microbiology team	N/A	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin out of season. Viral swabs referred to NVRL MUST be collected into liquid UTM (red top tubes). Do NOT use blue top eNAT swabs (used for Covid-19 testing). These will be rejected in NVRL
Reticulocyte Count	Blood	EDTA Lavender Cap 3ml	Urgent 1hr Routine 8 hrs / Same Day	16-80 x 10^9/l.	Haematology	One EDTA sample is adequate for Full Blood Count and Retic Count. Test is inappropriate post transfusion. Sample stability = 24hrs post collection.
Rifampicin levels	Blood	Serum Gold Cap 5mls	Phoned same day if received before 3pm Mon-Fri	See Report	Microbiology Dispatch	Referred to PHE Antimicrobial Reference Laboratory, Bristol
Rickettsia Abs (Typhus, Spotted fever)	Blood	Serum/ 5-10ml	16 days	See Report	Microbiology Dispatch	Referred to PHE Porton Down, Rare and Imported Pathogens Laboratory (RIPL)

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Rotavirus – see gastroenteritis virus screen	Faeces	Sterile Universal container				
Respiratory Syncytial Virus (RSV) Immunofluorescence	Respiratory secretions	Sterile Universal container	6 days	See Report	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin.
Respiratory Syncytial Virus (RSV) PCR – see Respiratory Virus Screen and Influenza PCR						
ROS1 immunohistochemistry	Tissue		10 days	See Report	Histology	Phone requests to IHC Lab (ext.4797 or email histolab@svhg.ie
Rubella Abs	Blood Saliva	Serum/ 5-10ml Oracol collection device (available from NVRL)	7 days	See Report	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin.
Rubella PCR	Saliva	Oracol collection device (available from NVRL)	By specific arrangement only	N/A	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin.
Rheumatoid Factor (RF)	Blood	Serum Gold Cap 5 mls	7 days	<3.5 IU/mL Negative 3.5-5 IU/mL Equivocal >5.0 IU/mL Positive	Immunology	RF is positive in 80% of patients with rheumatoid arthritis. Negative RF makes a diagnosis of RA unlikely, however does not completely exclude diagnosis. High levels of RF are frequently associated with rheumatoid arthritis. Levels of rheumatoid factor may increase with age, infection, malignancy, therapy with certain drugs, and in a range of inflammatory disorders. Minimum retesting interval: Not routinely required.
Salmonella abs (Typhoid, Widal test)	Blood	Serum Gold Cap 5 mls	8 days	See Report	Microbiology Dispatch	Referred to Eurofins Biomnis
Salicylate	Blood	Serum Gold Cap 5mL	90 minutes	See Comments	Clinical Chemistry	Severity of salicylate poisoning cannot be assessed from serum levels alone. Salicylate intoxication is usually associated with levels of > 350 mg/L. Severe toxicity is associated with salicylate levels of > 700 mg/L. Conjugated bilirubin levels above 140 umol/L may cause significant

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
						negative interference in the salicylate assay. Samples must be analysed within 24 hours of collection.
Schistosoma Abs	Blood	Serum/ 5-10ml	18 days	N/A	Microbiology Dispatch	Referred to Hospital for Tropical Diseases London.
SDHB – Succinate Dehydrogenase immunohistochemistry	Tissue		7 days	See Report	Histology	For all SDHB Immunohistochemistry test requests , please contact Dr. Niall Swan: n.swan@svhg.ie
Selenium	Blood	Serum (red cap non-gel) or heparin plasma or EDTA 5ml WHOLE Blood	7 days	See Report	Clinical Chemistry Dispatch	Specimens referred to Eurofins Biomnis.
Sex Hormone Binding Globulin (SHBG)	Blood	Serum Gold Cap 5mL	Daily Mon-Fri	Reference intervals are not provided in those <20 years old. Male 20-49y: 16.5-55.9 nmol/L ≥50 y: 19.3-76.4 nmol/L Female 20-49y: 24.6-122 nmol/L ≥50 y: 17.3-125 nmol/L	Clinical Chemistry	State if patient is on oestrogen or pregnant. In specimens from female samples, the free testosterone index is added automatically by IT rule to testosterone and SHBG requests. The ≥50 years reference interval has not been verified for use in those >70 years Biotin may cause some concentration dependent negative interference in this assay if high dose supplements are taken. If this is suspected, a repeat request 8 plus hours off Biotin is recommended in the first instance. Please contact the Duty Scientist on Ext 3127 for further details.
Sickle Cell Screening Test	Blood	EDTA Lavender Cap 3ml	Urgent: 2 hours Routine: Same Day	See final report	Haematology	Sample stability = 3 weeks at 2-10 C.
Sinus aspirate for C/S		Sterile Universal Container	2-7 days	N/A	Microbiology	Mycology culture also routinely performed on all sinus aspirate specimens.
Sirolimus (Rapamune)	Blood	EDTA Lavender Cap 3mls	20 days	Each patient should be individually monitored	Immunology	Specimens Referred to Harefield Hospital (UK).

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Skin for DIF (Direct Immunofluorescence)	Fresh skin to Histology lab immediately	Universal container	15 days		Histology	Contact laboratory prior to taking biopsy Ext. 4797/4350. GP DIF samples use saline-moistened gauze. Deliver directly to laboratory staff and notify person receiving it is for DIF Requirements: Two biopsies in separate specimen pots: (1) Lesional in 10% formalin (2) Perilesional (fresh or wrapped in saline moistened gauze)
Skin Sentinel Node melanoma detection	Adjacent lymph nodes	10% Formalin labelled Radioactive	10 days		Histology	Histology tissues (routine) must be fixed (in 10% formalin) immediately in containers of adequate size. The volume of fixative must be as least ten times the volume of the tissue. Ensure samples and form are labelled radioactive.
Skin / superficial wound swab for C/S	Skin swab	Bacterial Transport swab	48-96h	N/A	Microbiology	
Sodium	Blood	Serum Gold Cap 5mL	4 hours	133 - 146 mmol/L	Clinical Chemistry	NB: Do not take blood from a limb with an IV Infusion.
Sodium (Direct)	Blood	Serum Gold Cap 5mL	4 hours	133 – 146 mmol/L	Clinical Chemistry	NB: Do not take blood from a limb with an IV Infusion.
Urine Sodium Excretion	Urine - 24h collection	24h urine bottle (plastic) - no preservatives required	Daily (Mon – Fri)	40 - 220 mmol/24h	Clinical Chemistry	Urine creatinine is added to all urine sodium requests automatically by IT rule. Urinary volumes are reported in Litres.
Urine Sodium	Urine - Fresh spot	Sterile Universal Container - 5mL minimum	4 hours	Refer to clinical protocol	Clinical Chemistry	Urine creatinine is added to all urine sodium requests automatically by IT rule. Urine sodium requests will also have chloride and potassium measured automatically by IT rule.
Special stains: AFB/ZN Alcian Blue Alcian Blue/PAS Congo Red GRAM Masson Trichrome Grocott's Methenamine Silver Jones Methenamine Silver Maritus Scarlet Blue	Tissue / cytology		3 days		Histology	Phone requests to histology lab Ext 4613

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Millers Elastin Stain Oil Red O PAS PASD Perls Prussian Blue Retic Rubeanic Acid Shikata Orcein Haematoxylin Shikata Van Gieson Victoria Blue						
Specific Antibody Response to Pneumococcal Capsular Polysaccharide (Total IgG and IgG2)	Blood	Serum Gold Cap 5mls	28 days	Reference Ranges (Pneumococcal antibodies in non-vaccinated individuals): Age & gender related . See report	Immunology	Referred to Immunology, St. James's Hospital, Dublin 8 Investigating immunodeficiencies due to an inability to raise a specific antibody response.
Specific Response to Tetanus Toxoid (IgG)	Blood	Serum Gold Cap 5mls	28 days	For Tetanus Toxoid antibodies in vaccinated individuals: minimum protective level - 0.01 IU/ml optimum protective level - >0.1 IU/ml	Immunology	Referred to Immunology, St. James's Hospital, Dublin 8 Investigating immunodeficiencies due to thymic abnormalities.
Specific Antibody Response to Haemophilus Influenza Type b capsular polysaccharide (IgG)	Blood	Serum Gold Cap 5mls	28 days	For Haemophilus Influenza B Type b (HIB) antibody levels in vaccinated individuals the: Minimum protective level is 0.15 mg/L Optimum protective level is >1.0 mg/L	Immunology	Referred to Immunology, St. James's Hospital, Dublin 8 Investigating immunodeficiencies due to an inability to raise a specific antibody response.
Sputum Culture for respiratory pathogens	Sputum	Sterile Universal Container, minimum volume 1ml	*48-96 hrs	N/A	Microbiology	*Sputum from CF patients take up to 14 working days for culture results due to the nature of the organisms.

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Sputum for tumour	Fresh sample	Universal /approx. 5mls	5 days		Cytology	
Streptococcus Group B PCR	CSF	Sterile Universal container	Positive results phoned same day 16.00-17.00 if received before 11.00	N/A	Microbiology Dispatch	Referred to IMMRL, Temple Street
Streptococcus pneumoniae urinary antigen	Urine	Sterile Universal container 5-10ml	24hrs (Mon-Fri)	N/A	Microbiology	Part of screen for community-acquired pneumonia.
Streptomycin levels	Blood	Serum Gold Cap 5mls	Phoned same day if received before 3pm Mon-Fri	See Report	Microbiology Dispatch	Referred to PHE Antimicrobial Reference Laboratory, Bristol
Strongyloides Abs	Blood	Serum/ 5-10ml	18 days	N/A	Microbiology Dispatch	Referred to Hospital for Tropical Diseases London.
Syphilis Serology	Blood	Serum/ 5-10ml	7 days	N/A	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin.
Tacrolimus (also known as FK 506 or Prograf)	Blood	EDTA / 3mls	4 days	Each patient should be individually monitored	Immunology	Trough samples required (i.e. pre-dose). Sensitivity of assay 1.5ug/L. Specimens must be received in the laboratory by 10.30am in order to be analysed on the day of receipt. Samples should be stored at 4°C (fridge) overnight.
TB Specimens AFB Stain & TB Culture	Various Respiratory	Depending on the sample usually Sterile Universal Container	AFB Stain: 24-48hrs TB negative culture: 6 – 12 wks Positive culture – up to 50 days Next working day	N/A	Microbiology	All positive results are phoned to the team/ clinician when confirmed. * Molecular Detection – testing performed on approval by Consultant Microbiology only.

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Molecular Detection*	specimens					
TCR Gene Rearrangements	Bone Marrow or Blood	Marrow in RPMI (<24hrs old)or EDTA Lavender Cap 3ml x 2	2 - 3 weeks	See Report	Haematology Referred	Useful in T Cell Malignancies. Referred to Molecular Diagnostic Lab, St. James's Hospital. Samples must be received into laboratory before 11.30 for same day dispatch.
Teicoplanin	Blood	Serum Gold Cap 5mls	8 days	See Comments for Therapeutic Range	Microbiology Dispatch	Referred to Eurofins Biomnis. Pre dose sample should be taken immediately before the next dose is given. Pre-Dose Level: 10-40 mgs/L.
Testosterone	Blood	Serum Gold Cap 5mL	Daily (Mon-Fri)	Reference intervals are not provided in those <16 years old. Male 16-19 y: 6.2-30.6 nmol/L 20-49 y: 8.6-29.0 nmol/L ≥50 y: 6.7-25.7 nmol/L Female 16-19 y: 0.1-1.3 nmol/L 20-49 y: 0.3-1.7 nmol/L ≥50 y: 0.1-1.4 nmol/L	Clinical Chemistry	Indicate gender and age. In specimens from female samples, the free testosterone index is added automatically by IT rule to testosterone and SHBG requests. The ≥50 years reference interval has not been verified for use in those >70 years Biotin may cause some concentration dependent positive interference in this assay if high dose supplements are taken. If this is suspected, a repeat request 8 plus hours off Biotin is recommended in the first instance. Please contact the Duty Scientist on 221 3127 for further details. Before the use of testosterone preparations in females, serum testosterone levels should be assessed to exclude high baseline levels and to prevent subsequent supra-physiological replacement. Levels are ideally re-assessed within 3-4 months of starting treatment to ensure levels are kept within the female physiological threshold.
Tetanus Abs See Specific Response to Tetanus Toxoid (IgG)						.
Thalassaemia Screen	See Haemoglobinopathy Screen	See Haemoglobinopathy Screen	See Haemoglobinopathy Screen	See Haemoglobinopathy Screen	Haematology Referred	See Haemoglobinopathy Screen
Theophylline	Blood	Serum Gold Cap 5mL	Daily	Therapeutic Range: 10 - 20 mg/L	Clinical Chemistry	Blood should not be taken from a limb with an IV Aminophylline Infusion. Therapeutic effects may be achieved at levels above 5 mg/L and

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
				See comments.		undesirable side effects may occur at >15 mg/mL. Therefore, a lower therapeutic range has also been recommended to reduce toxicity (5 - 15 mg/L). Samples must be analysed within 24 hours of collection.
Thioguanine Nucleotide	Blood	EDTA Lavender Cap 3mL x 2	10 days	See Report	Clinical Chemistry Dispatch	Referred to Dr. Lynette Fairbanks, 3rd Floor Block 7, South Wing, St. Thomas Hospital, London SE1 7EH.
Throat Swab	Throat Swab	Bacterial Transport Swab	48-96hrs	N/A	Microbiology	For bacterial cause of sore throat.
Thrombin Time (Thrombin Time Ratio)	Blood	Sodium Citrate Light Blue Cap 3ml	Urgent = 4hrs	0.92 – 1.12	Haematology	Samples may be frozen if results not required urgently Sample stability = 4hrs post collection
Thrombophilia Screen [includes Protein C, Protein S, Anti-thrombin, Activated Protein C Resistance, Fibrinogen, Lupus Screen and ACA's]	Blood	Sodium Citrate Light Blue Cap 3ml x 5 , EDTA x 1 Serum gold cap x 1 to Immunology Lab for ACA testing.	6-8 weeks	Reports Issued with interpretative comments	Haematology	Testing is inappropriate during acute post thrombotic phase. Samples must be received in laboratory before 16:00 as samples require preparation prior to storage. A patient consent form **must** be filled out for any genetic studies e.g. Prothrombin gene mutation or Factor V Leiden. See guidelines for Thrombophilia Testing. Sample stability = 4hrs post collection.
Thyroglobulin Anti-Thyroglobulin	Blood	Serum Gold Cap 5mL	Daily (Mon-Fri)	3.5 - 77 ng/mL <115 IU/mL	Clinical Chemistry	A reliable Tg ($t_{1/2}$) estimation could be obtained by a simplified formula requiring only 2 post-surgery Tg measurements (24 and 120 hours, respectively). Measurement of Anti-Thyroglobulin Antibodies should only be requested in patients with thyroid carcinoma to aid the interpretation of Thyroglobulin concentrations. Please also see Anti-TPO and Thyroid Receptor Antibodies.
Thyroid FNA	At least 6 air-dried smears + needle rinse in Cytolyt*	In slide tray	12 days		Cytology	*Cytolyt available from Cytology Slides must be labelled in pencil with patient's full name and MRN (or DOB).
Thyroxine (free)						See Free T4
Tissue for C&S	Various	Sterile container – see note	48-96h		Microbiology	Special 70mls container (yellow-capped) available in theatre. No formaldehyde should be added.
Tobramycin	Blood	Serum Gold Cap 5mL	Daily	See Comments for Therapeutic Range	Clinical Chemistry	Single Daily Dose Regimen Patients on once daily regimens should have specimens taken 12-24 after the dose is given. Therapeutic Concentration

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
						0.33 – 0.9 mg/L. Samples must be analysed within 24 hours of collection. Target level is <1 mg/L for ALL patients. Ensure dose was calculated correctly and verify that level was taken >16 hours post-dose. If advice on dosing is required, the Clinical Microbiologist can be contacted at 4949/3459 or out of hours via the switchboard. Trough level <1 mg/L Maintain dosing regimen. Trough level ≥1 but ≤1.4 Reduce once daily dose by 1-2 mg/kg and repeat level 16-24 hours post-dose. Trough level >1.4 mg/L Hold dose and repeat level next day. Do not re-dose until level <1 mg/L.
Total T3						Total T3 has been replaced by a more specific test, Free T3. Please see details of Free T3 for specimen requirements.
Toxicology	Urine	Spot Urine	10 days	N/A	Clinical Chemistry Dispatch	National Drug Treatment Centre , Pearse Street NB: . Please do not request Toxicology Blood Screen, but specify drug tests required e.g Paracetamol, Salicylates, Ethanol Paracetamol, Salicylates, Ethanol are carried out in Clinical Chemistry. See individual tests for details of specimen types and TAT.
Toxocara Abs	Blood	Serum/ 5-10ml	18 days	N/A	Microbiology Dispatch	Referred to Hospital for Tropical Diseases London.
Toxoplasma Abs	Blood	Serum/ 5-10ml	7 days	N/A	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin.
Toxoplasma PCR	Blood CSF Tissue	Serum/ 5-10ml Sterile Universal container	Only by specific arrangement	N/A	Microbiology Dispatch	Referred to Toxoplasma Reference Unit, Public Health Wales, Swansea
Thiopurine Methyltransferase (TPMT)	Blood	5mL Heparin or EDTA whole blood, unspun	8 weeks - Batched analysis; dispatched weekly	Normal: 26 - 50 pmol/h/mg Hb Carrier: 10 - 25 pmol/h/mg Hb Deficiency: <10 pmol/h/mg Hb	Clinical Chemistry Dispatch	Referred to Outside Laboratory (Eurofins Biomnis).

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Transferrin	Blood	Serum Gold Cap 5mL	4 hours	2.00 - 3.60 g/L	Clinical Chemistry	Part of Iron Studies
Transferrin Saturation (% Transferrin Satn.)	NA	NA	4 hours		Clinical Chemistry	Part of Iron Studies Calculated test which requires measurement of serum iron and transferrin. Refer to Iron Studies for further detail.
Treponema pallidum Abs (syphilis, TPHA, VDRL, RPR)	Blood	Serum Gold Cap 5mls	7 days	See Report	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin.
Trichomonas vaginalis PCR	Swab Urine	Specific Aptima collection devices required.	7 days	N/A	Microbiology Dispatch	If Chlamydia trachomatis, *N. gonorrhoeae* or *Trichomonas vaginalis* is suspected please contact the NVRL (external patients) or Microbiology department (in-patients) for Aptima collection devices. These samples are referred to National Virus Reference Laboratory University College Dublin
Trichinella Abs	Blood	Serum/ 5-10ml	16 days	N/A	Microbiology Dispatch	Referred to Hospital for Tropical Diseases London.
Triglyceride (Please also see Lipid Profile)	Blood	Serum Gold Cap 5mL	4 hours	N/A	Clinical Chemistry	If triglycerides >10 mmol/L and no previous, or previous <10 mmol/L, then phosphate, GGT, creatinine and TSH are added automatically by IT rule. For lipid interpretation please see ESC/EAS guidelines for the management of dyslipidaemias. European Heart Journal (2019) doi.org/10.093/eurheartj/ehz455 "There are a number of well validated cardiovascular disease risk assessment systems available that are recommended as part of different guidelines. The 2019 European Guidelines on cardiovascular disease prevention in clinical practice provide a list of commonly used tools and the authorities recommending them. There is no consensus recommendation on which of these systems should be used, but it is agreed that these tools can enhance clinical decision making in the primary prevention of cardiovascular disease." Venepuncture should be performed prior to the administration of Metamizole as metabolites may cause interference with analysis.
Tropheryma whipplei PCR (Whipple's disease)	CSF (frozen <4h) Blood	Sterile Universal container Serum Gold Cap 5mls EDTA Lavender Cap 3mls	7 days	N/A	Microbiology Dispatch	Referred to Eurofins Biomnis

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Trypanosoma Abs	Blood	Serum Gold Cap 5mls	9 days	See Report	Microbiology Dispatch	Referred to Hospital for Tropical Diseases London.
Troponin T (hs) (Troponin T High Sensitivity)	Blood	Serum Gold Cap 5mL	90 min	<14 ng/L (99th centile of values in a healthy population)	Clinical Chemistry	Please note: TNThs is no longer available for GPs. High sensitivity Troponin T is an acute secondary care test. Please use the latest Universal Definition of Myocardial Infarction to diagnose a patient with acute myocardial infarction (AMI). An AMI may be diagnosed in the clinical setting of evidence of acute myocardial ischemia and myocardial injury with detection of a rise and/or fall of troponin with at least one value greater than the 99th percentile upper reference limit and at least one of: symptoms of myocardial ischemia; new ischemic ECG changes; development of pathological Q waves; imaging evidence consistent with new myocardial ischemia or identification of a coronary thrombus by angiography or at autopsy. The finding of an elevated troponin concentration alone or even a pattern of rising or falling is not enough to diagnose an AMI as myocardial injury due to non-ischaemic causes is common. Thus, additional clinical information is essential to define the cause of the injury and to diagnose AMI. The Roche Troponin T (hs) assay is considered to be a Guideline Acceptable, Level 2, high sensitivity assay. The limit of detection of the assay is 5ng/L, the limit of quantification is 13ng/L and the 99th percentile is 14ng/L. Haemolysed serum samples can produce falsely low cardiac Troponin T results. Haemolysed troponin T results >=14 ng/L will be reported with a greater than symbol before the result to provide an approximate result to the requestor. Results should be confirmed in a non-haemolysed serum sample as soon as possible. Biotin may cause some concentration dependent negative interference in this assay if high dose supplements are taken. If this is suspected, a repeat request 8 plus hours off Biotin is recommended in the first instance. Please contact the Duty Scientist on Ext 3127 for further details.
Tryptase - for Anaphylatic Reaction	Blood	Serum Gold Cap 6 ml*	14 days	2-14 ug/L	Immunology	For investigation of anaphylaxis, samples should be taken 30 mins to two hours after the start of the reaction, and baseline tryptase at least 24

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
						hours after complete resolution of symptoms, to support diagnosing anaphylaxis retrospectively. Serum tryptase levels 30 mins to two hours after the start of the reaction (1.2 x baseline tryptase) + 2ug/L supports a diagnosis of anaphylaxis. EAACI guidelines: Anaphylaxis (2021 update). (2022) Allergy77:357-377
TSH	Blood	Serum Gold Cap 5mL	Daily (Mon-Fri)	0.27 - 4.20 mIU/L	Clinical Chemistry	TSH is performed as a front line thyroid function test. Current TFT reflex rules are as follows: - If TSH >4.2 add fT4 - If TSH <0.27 add fT4 and fT3 Biotin may cause some concentration dependent negative interference in this assay if high dose supplements are taken. If this is suspected, a repeat request 8 plus hours off Biotin is recommended in the first instance. Please contact the Duty Scientist on Ext 3127 for further details
Ulcer swab for C/S	Ulcer swab	Bacterial Transport swab	48-96h	N/A	Microbiology	
Urate (Uric Acid)	Blood	Serum Gold Cap 5mL (Pre-chilled plasma Lithium Heparin Green Cap tube for patients on Rasburicase, transported to lab on ice)	4 hours	Male: 200-420 umol/L Female: 140-360 umol/L	Clinical Chemistry	If the uric acid result is <100 umol/L query if the patient is on Rasburicase. Ideally, patients on Rasburicase would not have uric acid measured until >5 days post-treatment (Depreter et al 2016, Clin Biochem 49(18)). However, if clinically required the sample should be taken into a pre-chilled lithium heparin (green) tube. Pre-chilled lithium heparin tubes are available from Phlebotomy. The sample should be placed in ice for immediate transport to Biochemistry. The sampling time and the urgency should be clearly marked on the tube. **Please note:** While cooling will reduce the Rasburicase activity it does not stop it completely, uricolysis will continue *ex vivo* irrespective of the temperature. Venepuncture should be performed prior to the administration of Metamizole as metabolites may cause interference with analysis.
Urine Uric Acid Excretion (Urine Urate Excretion)	Urine - 24hr collection	Spot Urine or 24h urine bottle (plastic) - no preservatives required	Mon- Fri Same day if received before 11am.	Early morning Urine Sample 2200-5475 umol/l or 1200 - 5900 umol/24h	Clinical Chemistry	Urine collection bottle and request form must be clearly labelled with patient name and hospital number. The date and time of the start and finish of the 24 hour collection must be clearly indicated. Urinary volumes are reported in Litres. Urine creatinine is added to all urine uric acid requests automatically by IT

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
						rule.
Urea	Blood	Serum Gold Cap 5mL	4 hours	2.5- 7.8 mmol/L	Clinical Chemistry	Part of Urea and Electrolytes Profile.
Urine Urea Excretion	Urine - 24h collection or spot urine	24h urine bottle (plastic) - no preservatives required or Sterile Universal container (spot)	Mon- Fri Same day if received before 11am.	Urinary Urea Excretion 286-595 mmol/l 428-714 mmol/24h (Based on average output of 1.2-1.5/24h)	Clinical Chemistry	Urine collection bottle and request form must be clearly labelled with patient name and hospital number. The date and time of the start and finish of the 24 hour collection must be clearly indicated. Urinary volumes are reported in Litres. Urine creatinine is added to all urine urea requests automatically by IT rule.
Urea / Electrolytes See Renal Profile					Clinical Chemistry	
Urinary Haemosiderin	Urine	Universal Container 20 ml	5-10 days Provisional report available from Haematology Team	See final report	Haematology	Samples should be fresh. Sample stability = 12hrs post collection
Urinary Myoglobin [See CK]		See Comment				Test not available. Total CK is more useful indication of Rhabdomyolysis
Urine Examination Cell Count/ Culture	MSU / CSU	Sterile Universal Container	24-72h	WCC: 1 - 10/cmm RCC: <1 /cmm	Microbiology	Colony Count: >100,000CFU/ml indicative of UTI.
Urine for tumour	Fresh sample	Sterile Universal	5 days		Cytology	
Valproate	Blood	Serum Gold Cap 5mL	Daily	50 - 100 mg/L	Clinical Chemistry	Serum concentrations are no better a guide to clinical response than is the dose. Therefore routine monitoring of Valproate concentrations is not recommended. Measurement in psychiatric patients may be useful when compliance is an issue. Samples must be analysed within 24 hours of collection. If Valproate >100 mg/L, LFTs added on automatically by IT rule.
Vancomycin	Blood	Serum Gold Cap 5mL	Daily	See Comment for Therapeutic Range	Clinical Chemistry	Therapeutic Drug Monitoring (TDM) is required for all patients on IV vancomycin. Recommended dosing and required monitoring is available in the Medicines Guide App. Samples must be analysed within 24 hours of collection. All requests for vancomycin will have a creatinine measured automatically by IT rule. Ensure trough level was measured PRE-DOSE (i.e. within 1 hour of dose being administered). Target level is 15-20 mg/L

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
						for ALL patients. Doses should NOT be held while awaiting levels.
Varicella zoster virus (VZV) Abs	Blood	Serum/ 5-10ml	7 days	N/A	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin.
Varicella zoster virus (VZV) PCR	CSF Vesicular fluid Eye swab Throat swab Blood	Sterile Universal container Viral swab (liquid viral UTM – red top container) Serum/ 5-10ml	6 days CSF 9 days other	See Report	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin Viral swabs referred to NVRL MUST be collected into liquid UTM (red top tubes). Do NOT use blue top eNAT swabs (used for Covid-19 testing). These will be rejected in NVRL
Venous Blood Gases	Venous Blood	Pre-heparinised blood gas syringe - 2mL	15 min	pH = 7.32 - 7.43, Direct ISE: Na: 133-146 mmol/L K: 3.5-5.3 mmol/L Cl: 95-108 mmol/L HCO_3: 22.0-29.0 mmol/L	Clinical Chemistry	After taking sample, ensure no air bubbles are present. Bring to the lab immediately. ABG specimen should not be sent via the POD system. The pO_2 reference range refers to patients on room air. For patients on oxygen therapy, a pO_2 of 8 kPa is generally taken as a minimum target.
VIP	Blood	EDTA Aprotinine Tubes plasma freeze within 1 hour	10 days		Clinical Chemistry Dispatch	Eurofins Biomnis
Viral culture / viral studies	Various specimen types	Sterile Universal container Viral swab (liquid viral UTM – red top container) Always state clinical details and specimen site	11-25 days	N/A	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin Viral swabs referred to NVRL MUST be collected into liquid UTM (red top tubes). Do NOT use blue top eNAT swabs (used for Covid-19 testing). These will be rejected in NVRL
Vitamin A	Blood	6 mL Serum Non Gel (red cap). Protect from light. Freeze within 1 hour.	1-2 weeks	See Report	Clinical Chemistry Dispatch	Referred to Outside Laboratory (Eurofins Biomnis). To be frozen. Batched weekly for dispatch. Please note: recommendation to measure retinol binding protein and CRP alongside vitamin A as the binding protein concentration and acute phase reaction will affect the vitamin A concentration.
Vitamin B1 (Thiamine)	Blood	2mL EDTA whole blood. Protect from light. Freeze within 4 hours.	7 days		Clinical Chemistry Dispatch	Referred to Eurofins Biomnis

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Vitamin B12	Blood	Serum Gold Cap 5mL	Daily	197 - 771 ng/L	Clinical Chemistry	Please state if patient is receiving exogenous Vitamin B12. Folate is added to all requests for vitamin B12. Biotin may cause some concentration dependent positive interference in this assay if high dose supplements are taken. If this is suspected, a repeat request 8 plus hours off Biotin is recommended in the first instance. Please contact the Duty Scientist on Ext 3127 for further details. Routine screening for Vitamin B12 deficiency is not indicated https://www.hse.ie/eng/about/who/cspd/ncps/pathology/resources/guideline-6-laboratory-testing-for-vitamin-b12-deficiency.pdf Add on requests are not accepted due to stability issues.
Vitamin B6 (Pyridoxine)	Blood	EDTA whole blood. Protect from light. Freeze within 4 hours.	7 days	42 - 115 mmol/L	Clinical Chemistry Dispatch	Specimens should be stored away from light. Referred to Outside Laboratory (Eurofins Biomnis). Specimens must be received into laboratory before 12.00 for same day dispatch.
Vitamin C (Ascorbic Acid)	Blood: Test not routinely available. Request to be reviewed by Duty Scientist.	**Plasma Green Cap - 5mL. Protect from light.	7 days	See Report	Clinical Chemistry Dispatch	**Bring specimen to laboratory immediately as specimen must be frozen within one hour. 3mL of frozen plasma is required for test. Specimen must be stored away from the light. Specimen referred to Eurofins Biomnis. "This test is useful in the diagnosis of deficiency which causes scurvy which is a disease which involves bones, joints and mucous membranes. Scurvy is rare, usually affecting children of between 6 and 12 months nourished exclusively on formula without any vegetables or fresh fruit. It can also occur in alcoholics, the elderly and patients suffering from chronic malabsorption or on non-supplemented parenteral alimentation."
Vitamin D ($(1,25(OH)_2D)$ Calcitriol	Blood	Serum Gold Cap 5mL	40 days (Batched)	43 – 168 pmol/L	Clinical Chemistry Dispatch	Referred to Norwich Hospital. Specimens should be delivered to the laboratory as soon as possible post venepuncture. If same day delivery is not possible serum must be separated and frozen (ideally within 4 hours).
25(OH)Vitamin D	Blood	Serum Gold Cap 5mL	Daily	30-125 nmol/L	Clinical Chemistry	
Vitamin E	Blood	Non-gel serum (red cap). Protect from light. Freeze within 1 hour.	1-2 Weeks batched analysis, dispatched weekly.	See Report	Clinical Chemistry Dispatch	Referred to Outside Laboratory (Eurofins Biomnis). Specimens must be received into laboratory before 12.00 for same day dispatch. Batched weekly for dispatch. Please note: recommendation to measure cholesterol and triglycerides alongside Vitamin E. As the acute phase response affects both plasma α-tocopherol and lipids, a ratio of VitE/cholesterol + trigs will be unaffected and may prove useful for interpretation in the setting of an acute phase response.

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Vitamin K	Serum	**Serum Red/Gold Cap - 2mL. Protect from light.	2 weeks	See report form	Clinical Chemistry Dispatch	**Protect specimen from light. Serum must be separated and frozen within 1 hour. Referred to Eurofins Biomnis Laboratory. Batched weekly for dispatch. Please note: Prothrombin time may prove useful if investigating Vitamin K deficiency. However, prothrombin time should not replace Vitamin K testing as Vitamin K is considered a better marker of nutritional status.
Vitamin K for Warfarin Resistance	Serum	Serum Gold Cap 6mls Protect from light	20 days	See Report	Haematology Referred	Warfarin levels must also be measured. Referred to St. Thomas Hospital, London.
Vitreous FNA	Fresh fluid	Syringe	5 days		Cytology	Sent to Histology laboratory from Royal Victoria Eye and Ear Hospital, Dublin.
Vitreous Wash	Fluid	Sealed container (with varying volume of saline)	5 days		Cytology	Sent to Histology laboratory from Royal Victoria Eye and Ear Hospital, Dublin
VKORC1 Sequencing	Blood	EDTA Lavender Cap 3 ml	20 days	See report form	Haematology Referred	Referred to St. Thomas Hospital, London. Genetic test to detect Warfarin resistance. Warfarin levels should also be measured.
VMA NA-please see note opposite	Urine - 24h collection	24h urine collection in an acidified 24h urine container	1 week	0.8-2.0 ummol/mmol Also reported in (umol/24h)	Clinical Chemistry Dispatch	VMA shall now be measured on Patients < 16 yrs only All other Requests for Urinary VMA will have Urinary Metanephrines measured instead as they are more specific and sensitive. Please see details for Metanephrines.
Von Willebrand's Disease screen	Blood	Sodium Citrate Light Blue Cap 3ml x 4	4-6 weeks	See Report	Haematology Referred	Referred to NCHCD, St James's Hospital. Samples must be received into laboratory before 11.30 for same day dispatch. Samples received after this time should be sent to coagulation lab for separation and freezing. The TAT is 6 weeks if VWF:CB is included in the screen
Voriconazole levels	Blood	Serum Gold Cap 5mls	12 day	See Report	Microbiology Dispatch	Referred to PHE Bristol, Mycology Reference Laboratory
VRE Screen	Rectal Swab	Bacterial Transport Swab	96h	N/A	Microbiology	VRE screening applies to certain wards only. If VRE is required, please ensure to request it specifically on the request form. Otherwise rectal swab will be processed for CPE only.
vWF Cleaving Protease See ADAMTS 13						

Analyte / Investigation	Specimen Type	Container Type / Volume	Turn Around Time	Reference Interval (or clinical decision value)	Laboratory	Comments Further Information is available from the laboratory or online at http://labtestsonline.org
Warfarin Levels	Blood	Serum Red/Gold Cap 6mls	10 days	See Report	Haematology Referred	Serum must be separated. Vitamin K levels must also be measured. Specimens referred to St. Thomas Hospital, London.
Water Analysis - endoscopy	Water	Must be sent chilled. Send on day of sampling.	12 days	See Report	Microbiology Dispatch	Referred to Public Health Laboratory, Cherry Orchard Hospital
West Nile virus	Blood	Serum Gold Cap 5mls	Only tested by specific arrangement	N/A	Microbiology Dispatch	Referred to National Virus Reference Laboratory University College Dublin.
White Cell Differential	Blood	EDTA Lavender Cap 3 ml	Urgent 2 Hours Routine – 8 hours / Same Day GP/OPD- 48 hours	See Report	Haematology	Differential (Neutrophils/Lymphocytes/Monocytes/Basophils/Eosinophils) included in Full Blood Count during routine hours. Must be requested separately out of hours. Sample stability = 24hrs post collection
Wound Swabs	Various	Bacterial Swab from site or exudate	48 - 96 hrs	N/A	Microbiology	Please state site of swab on form in order to get the appropriate result.
Yersinia Abs	Blood	Serum/ 5-10ml	11 days	N/A	Microbiology Dispatch	Referred to Eurofins Biomnis if deemed appropriate by Clinical Microbiology team
Zinc	Blood	Serum Trace Element Tube - navy cap with red stripe on tube, separated and refrigerated.	1 week	See Report	Clinical Chemistry Dispatch	Specimen referred to Eurofins Biomnis.