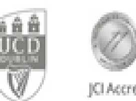

St Vincent’s Healthcare Group
Department of Pathology and Laboratory Medicine

# PATHOLOGY USER HANDBOOK

## Edition 9
## August 2024

**Note this edition contains updates to Edition 8.2 as detailed on page 4**

**(Document valid until September 2025)**

# TABLE OF CONTENTS

TABLE OF CONTENTS ..... 2
SUMMARY OF CHANGES ..... 4
PART 1 – GENERAL USER INFORMATION ..... 5
1.0 INTRODUCTION ..... 5
2.0 QUALITY ASSURANCE ..... 5
3.0 USER SATISFACTION, PATIENT FEEDBACK, COMMENTS AND COMPLAINTS ..... 6
4.0 LOCATION AND OPENING HOURS ..... 7
4.1 Pathology Reception SVUH ..... 7
4.2 Laboratory ..... 7
4.3 Phlebotomy ..... 10
4.4 MORTUARY ..... 11
5.0 CONTACT DETAILS FOR KEY LABORATORY PERSONNEL ..... 12
5.1 General Laboratory Contact details during routine and out of hours periods ..... 12
5.2 Key Laboratory Personnel ..... 12
6.0 LABORATORY REQUESTS ..... 15
6.1 Electronic Requests (Maxim OCS) ..... 15
6.2 Laboratory Request Forms ..... 15
6.3 Request forms – Blood Transfusion Specific Requirements ..... 16
6.4 GP Request Forms ..... 17
7.0 SPECIMEN CONTAINERS ..... 17
7.1 Blood Specimen Containers ..... 18
7.2 Histology Specimen Containers ..... 19
7.3 Urine Specimen Containers ..... 19
7.4 Other Specimen Containers ..... 19
7.5 GP Stock Orders ..... 20
8.0 PHLEBOTOMY ..... 20
8.1 Patient Identification ..... 20
8.2 Obtaining Consent ..... 21
8.3 Phlebotomy Procedure ..... 21
8.4 Haemolysed Samples ..... 23
8.5 Draw Order for Blood Specimens ..... 24
8.6 Advice for Patients Attending Phlebotomy for Blood Tests ..... 24
9.0 SPECIMEN COLLECTION AND COLLECTION INFORMATION FOR PATIENTS ..... 25
9.1 Phlebotomy ..... 25
9.2 Collection of Blood Culture Bottles ..... 25
9.3 Patient Information for Oral Glucose Tolerance Test ..... 25
9.4 Protocol for Oral Glucose Tolerance Test (OGTT) in OPD/ CF Centre ..... 25
9.5 Patient Instructions for making a 24-hour Urine collection ..... 26
9.6 Patient Instructions for collection of specimens for Microbiology ..... 26
10.0 SPECIMEN LABELLING ..... 28
10.1 General Requirements ..... 28
10.2 Labelling Blood Transfusion Samples ..... 28
11.0 SAMPLE ACCEPTANCE CRITERIA ..... 29
12.0 SPECIMEN TRANSPORT ..... 29
12.1 General Considerations ..... 29
12.2 Specimens from Within the Hospital ..... 30
12.3 Pneumatic Tube System SVUH/SVPH (POD) ..... 30
12.4 Packaging of diagnostic specimens from GP surgeries, External Hospitals and Clinics ..... 31
12.5 Transport and Storage of Histological Samples ..... 31
12.6 Transport of Sentinel nodes protocol ..... 32
12.7 Quality of Blood Transfusion Samples ..... 32
12.8 Labelling and Transport of CSF Samples ..... 32
13.0 TEST TURNAROUND TIME ..... 32
13.1 Sample Stability/ Receipt of samples ..... 33
13.2 Storage of Examined Samples ..... 33
13.3 Requesting Additional Examinations ..... 33
13.4 Time Limit for Requesting Additional Examinations ..... 33

13.5 Repeat Examinations ... 33
**14.0 EMERGENCY OUT OF HOURS SERVICE ... 33**
14.1 Clinical Chemistry ... 34
14.2 Haematology ... 34
14.3 Blood Transfusion ... 34
14.4 Microbiology ... 34
14.5 Histology ... 34
14.6 Immunology ... 34
**15.0 CONTACT DETAILS OF ON-CALL PERSONNEL ... 35**
**16.0 REPORTING OF RESULTS, CLINICAL ADVICE AND INTERPRETATION ... 35**
16.1 General Information ... 35
16.2 Blood Bank ... 36
16.3 Clinical Chemistry ... 36
16.4 Haematology ... 37
16.5 SVPH Satellite Laboratory ... 38
**17.0 INSTRUCTIONS FOR WARD ENQUIRY FOR VIEWING LABORATORY RESULTS ... 39**
17.1 Ward Enquiry (LIS) ... 39
17.2 Maxim OCS Results Review ... 39
**18.0 CRITERIA FOR PHONING RESULTS ... 39**
18.1 Criteria for phoning Haematology results SVUH, SVPH, SMH ... 40
18.2 Criteria for phoning Clinical Chemistry Results ... 42
18.3 Criteria for phoning Immunology Results ... 43
18.4 Criteria for Phoning Microbiology Results ... 44
18.5 Criteria for Phoning Histopathology Results ... 45
18.6 Criteria for Phoning Blood Transfusion Results ... 45
**19.0 INFECTION CONTROL ... 46**
**20.0 COAGULATION SERVICE ... 46**
20.1 Anticoagulation Monitoring Service ... 46
20.2 Guidelines for Thrombophilia Screening ... 46
**21.0 IMMUNOLOGY SERVICE ... 47**
21.1 Immunology Test Profiles ... 48
21.2 Allergy testing ... 48
21.3 Collection and transport of samples for detection of cryoglobulin/ cryofibrinogen ... 48
**22.0 MORTUARY SERVICE - ARRANGEMENTS FOR THE PERFORMANCE OF AN AUTOPSY ... 49**
22.1 Coroner Post Mortem ... 49
22.2 Hospital (Non-Coroner) Post Mortem ... 49
**23.0 HOSPITAL BLOOD BANK SERVICE ... 49**
23.1 Information for Blood Transfusion Requests from SVUH and SVPH ... 49
23.2 Information for Blood Transfusion Requests from St. Michael's Hospital ... 50
23.3 Information for Blood Transfusion Requests from St. Columcille's Hospital ... 51
23.4 Blood Transfusion Turnaround Times in SVUH and SVPH ... 52
23.5 Emergency Issue of Blood for SVUH and SVPH ... 52
23.6 Blood Products ... 52
23.7 Maximum Surgical Blood Ordering Schedules (MSBOS) ... 54
23.8 Other Blood Transfusion Services ... 54
**24.0 HISTOPATHOLOGY SERVICES ... 54**
24.1 Frozen Sections ... 54
24.2 Conferences ... 54
**25.0 REFERRAL LABORATORIES – EXTERNAL SERVICES ... 55**

**PART 2 – TEST INFORMATION ... 56**

**TEST REQUIREMENTS ... 56**

## 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 8.2 | |
|---|---|
| Section | Significant changes from previous edition |
| | Updates required for transition from ISO15189:2012 to ISO15189:2022 |
| Section 2 | Additional Information in relation to scope of activates and scope of accreditation |
| Section 3 | Additional Information for patients |
| Section 5 | Updates to Key Staff |
| Section 18 | Review and update of Clinical Chemistry phoning criteria |
| Test Specific Changes – Test Information | Various changes made to test information including:<br>Updated turnaround times in Histology, and Microbiology Covid/ Flu testing. |

# 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, Microbiology, 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.
Clinical Chemistry testing and some Haematology testing in the Satellite Laboratory in St Vincent's Private Hospital is also in compliance with ISO15189 and accredited by INAB.

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 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 Donal Murphy, Laboratory Manager, St Vincent's University Hospital, Telephone 221 4510 / email d.murphy@svuh.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.

The Department of Pathology And Laboratory Medicine welcomes feedback and suggestions. 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.

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 - 6pm | |
| Clinical Chemistry<br>Blood Transfusion<br>Haematology | Routine Laboratory Hours<br>Monday – Friday 8am – 8pm<br>Saturday 9:30am – 12:45pm | Emergency Out of Hours Service<br>(On-Call Service)<br>Monday – Friday 8pm – 8am<br>Saturday 12:45pm – Monday 8am. |
| Microbiology | Routine Laboratory Hours<br>Monday – Friday 8am – 8pm<br>Saturday 9:30am – 12:45pm<br>Sun (BH) 9.30am-12.45pm (Blood cultures only) | Emergency Out of Hours Service<br>(On-Call Service)<br>Monday – Friday 8pm – 8am<br>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.

SMH Laboratory Opening Hours

| Department | Opening Times | |
|---|---|---|
| **SMH Laboratory** Haematology & Clinical Chemistry | Routine Laboratory Hours<br>Monday – Friday 9.00am – 5pm<br>Saturday 9.30am – 1pm<br>Sunday 10.00am - 1pm | Emergency Out of Hours Service Provided by the laboratory at SVUH |

List of the tests performed at SMH Laboratory:

| Test Performed in SMH Laboratory<br>Clinical Chemistry | Haematology/Coagulation |
|---|---|
| Urea and Electrolytes (Na, K, Cl, Urea, Creatinine) | FBC |
| Liver Function Tests (Alb, Bili, Alk Phos, GGT,ALT,AST, | ESR |
| Total Protein) | 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 |

SMH Turnaround times are 4 hours for routine Haematology and Biochemistry tests but 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 15.1.
Routine Courier to SVUH runs at 10.00, 12.00 and 3.30 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 National Radio Cabs Ph: 2840888.

### 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**<br>Haematology + Clinical Chemistry | Routine Laboratory Hours:<br>Monday – Friday 8am – 6pm<br>Saturday & Sunday (and BH):<br>8am – 3pm | Emergency Out of Hours Service:<br>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)<br>Liver Function Test (Alb, Bili, Alk Phos, GGT,ALT)<br>Ca, PO4, Mg, Urate<br>Total Protein<br>Amylase<br>LDH, CK<br>Lipids (T. Chol, Tg, HDL Chol, LDL Chol)<br>Iron Studies (Iron, Transferrin)<br>Glucose<br>AST<br>CRP | TSH, Free T4, Total T3, Free T3<br>Cortisol<br>Total PSA<br>CEA<br>AFP<br>βHCG<br>CA 19.9, CA 15-3, CA 125<br>High Sensitivity Troponin T<br>Ferritin, Folate, Vitamin B12<br>eGFR<br>HbA1c<br>Gentamycin<br>Vancomycin | FBC<br>ESR<br>Blood Films<br>PT<br>INR<br>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<br>Haematology + Clinical Chemistry | Routine Laboratory Hours:<br>Monday – Friday: 9.00am–5pm<br>Saturday: 9.00am–12noon | Emergency Out of Hours Service:<br>Provided by the laboratory at SVUH |

Routine Courier to SVUH runs at 10.15, 11.30, 13.30 and 15.30 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:<br><br><br>Liver Function Test:<br><br><br>Bone Profile:<br><br>Lipid Profile:<br><br><br>Other: | Urea, Creatinine, Sodium, Potassium, Chloride.<br><br>T.Bilirubin, T.Protein, Albumin, GGT, ALT, AST, ALP.<br><br>Calcium, Phosphate, Albumin, ALP.<br><br>Cholesterol, Triglycerides, HDL-Chol, LDL-Chol (fasting)<br><br>Amylase<br>CK<br>Glucose<br>Iron/TIBC<br>LDH<br>Magnesium<br>Uric Acid | FBC<br>ESR<br>Blood Film<br>PT/INR<br>APTT<br>D-dimer<br>Infectious Mono |

## 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<br>Fri 8am – 4pm<br>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<br>Fri 8am – 4pm<br>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<br>AMS is located in the Herbert Wing (Old Private Hospital) |
|---|---|

Access to the phlebotomy service is restricted to patients who are 14 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<br>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<br>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 14 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 no phlebotomy service on a Saturday or Sunday.

### 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<br><br>Sat 9:30am – 12.45pm | 4449<br><br>4449 | Ext 4449 or bleep 465 |
| Haematology | Mon – Fri 8:00am – 8:00pm<br><br>Sat 9:30am – 12.45pm | 4280/4395<br><br>4280 | Ext 4785 or Bleep 465 |
| Clinical Chemistry | Mon – Fri 8:00am – 8:00pm<br><br>Sat 9:30am – 12.45pm | 4550/ Duty Scientist for clinical queries 3127 (Mon to Fri 9 am to 5 pm)<br>4550 | Ext 3828 or bleep 159 |
| Microbiology | Mon – Fri 8:00am – 8:00pm<br>Sat 9:30am – 12.45pm<br><br>Sun (BH) 9.30am-12.45pm (Blood cultures and COVID/Flu only)<br>*Mon-Sun 8pm-12pm (COVID/Flu from ED only) | 4470/4450<br><br>4912 | Bleep 465 or Contact switch for Consultant Microbiologist on-call |
| Immunology | Mon – Fri 8:00am – 5:00pm | 4598 | Contact Switch |
| Histology | Mon – Fri 8:00am – 6:00pm<br><br>Sat 9:30am – 12.45pm | 4330/4137<br><br>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 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 | Dr. Suzy Fitzgerald | 4470 |
| Laboratory Manager | Mr. Donal Murphy | 4510 |
| Pathology Administration | Mr Cian O'Connor<br>Ms Michelle English/ Ms Laura Nolan | 5560<br>4167 |
| Pathology Quality Manager | Ms Anne Dickinson | 3695 |
| Pathology ICT Manager | Mr John Hill | 6145 |
| Clinical Chemistry SVUH | | |
| Consultant Chemical Pathologist<br>Clinical Advice/Interpretation | Dr. Patrick Twomey | 4430 |
| Chief Medical Scientist | Dr Anne Lardner (Interim) | 4490 |
| Principal Biochemists | Dr. Mark Kilbane<br>Dr Heloise Tarrant<br>Dr. Thomas Smith<br>Ms Esther Purcell | 4513<br>4607<br>4629<br>4789 |
| Duty Scientist<br>(Clinical Enquiries only)<br>Routine Hours 09:00 – 17:00<br>dutyscientistclinchem@svuh.ie | | 3127 |
| General Enquiries | | 4550 |
| Clinical Chemistry Scientist On-Call (and Saturday am)<br><br><br><br>Clinical Advice on-call | <br><br><br><br>Dr Patrick Twomey<br>Prof. Carel Le Roux | Bleep 159<br>4654, 3828, (Lab)<br>3124 (Senior Room)<br>4371 (Med Res Ext)<br>0877439023<br>0864117842 |

| Blood Transfusion | | |
|---|---|---|
| Consultant Haematologist<br>Clinical Advice/Interpretation/<br>Haemovigilance | Dr. Joan Fitzgerald<br>Dr. Kieran Morris | 3125 / 4449<br>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<br>Medical Scientist On-Call | See extension details | 4785 / 4449<br>Bleep 465 |
| Haematology (SVUH) | | |
| Consultant Haematologist/<br>Clinical Advice /Interpretation | Dr. Karen Murphy<br>Dr. Kamal Fadalla<br>Dr. Joan Fitzgerald<br>Dr. Liam Smyth<br>Dr. Claire Andrews<br>Dr. Mark Coyne<br>Dr. Gerard Connaghan (Lcm)<br>Dr. Maryse Power | 3125 / 4280<br>3125 / 4280<br>3125 / 4280<br>3125 / 4449<br>3125 / 4280<br>3125 / 4280<br>3125 / 4280<br>3125 / 4280 |
| Haematology Registrar | Haematology Team | Bleep 371/665 |
| Chief Medical Scientist | Mr. Ciaran Mooney | 4783 |
| Anticoagulant Nurse Specialist<br>Anticoagulant Monitoring Service Secretary | | Bleep 663<br>4153 |
| Laboratory Enquires | Admin team | 4280 |
| Blood Transfusion/Haematology / Microbiology<br>Medical Scientist On-Call | On Call Duty Scientists | 4785 / 4449<br>Bleep 465 |
| Haematology Fax | | 01 2213968 |

| Histopathology (SVUH) | | |
|---|---|---|
| Consultant Histopathologists<br>Clinical Advice/Interpretation | Dr. Tom Crotty<br>Prof. Kieran Sheahan | 4270<br>4733 |

| | | |
|---|---|---|
| | Prof. Cecily Quinn<br>Prof. David Gibbons<br>Prof. Susan Kennedy<br>Dr. Eoghan Mooney<br>Prof. Niall Swan<br>Prof. Aurélie Fabre<br>Dr. Niamh Nolan<br>Dr. Clare D'Arcy<br>Dr Maura Cotter<br>Dr. Aoife Maguire<br>Dr. Lindsey Clarke<br>Dr. Niamh Banvile (Locum)<br>Dr. Brian Pierce (Locum)<br>Prof Leona Doyle | 4658<br>3851<br>4725<br>3851<br>4798<br>3276<br>4788 (Pager 2085379)<br>5101<br>3852<br>6150<br>4725<br>5940<br>3852<br>3337 |
| Molecular Pathology Consultant Lead<br>Consultant Neuropathologist | Prof Adrian Marino-Enrique<br>Prof. Michael Farrell | 3337<br>01 8092631 |
| NCHD's | | 4293/4799 |
| Chief Medical Scientist | Mr John Harford | 3855/4613 |
| Laboratory Enquires | | 4330 |
| Immunology (SVUH) | | |
| Consultant Immunologist<br>Clinical advice/ Interpretation | Prof. Conleth Feighery | 4953 |
| Chief Medical Scientist | Dr. Eleanor Wallace | 4953 |
| Laboratory Enquires | | 4598 |
| Microbiology (SVUH) | | |
| Consultant Microbiologists<br>Clinical Advice /Interpretation | Dr Sinead McDermott<br>Dr. Suzy FitzGerald<br>Dr. Sinead McNicholas<br>Dr Kirsten Schaffer<br>Dr Lillian Rajan<br>Dr Laura Ryan<br>Dr Karina O'Connell | 4972<br>4470<br>4852<br>4853<br>4470<br>4470<br>4470 |
| Microbiology Registrars | | 4949/4088/3196/3197 |
| Chief Medical Scientist | Ms Abigail Salmon | 4794 |
| Infection Control Nurses | | 4948/4088/3196/3197 |
| Laboratory Enquiries | | 4450/4470 |
| Phlebotomy (SVUH) | | |
| Senior Phlebotomist | Ms Miriam Hogan<br>Mr Eddie Permalino<br>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 | Mr Donal Murphy | 4510 |
| Chief Medical Scientist | Ms Rebecca Nolan | 8397 |

| SMH Laboratory (SMH) | | |
|---|---|---|
| Laboratory Director | Dr Liam Smyth | SVUH Switch |
| Consultant Haematologists<br>Clinical advice/ Interpretation | Dr Liam Smyth/ Dr Mark Coyne | SVUH Switch |
| Consultant Chemical Pathologist<br>Clinical advice/ Interpretation | Prof. Carel Le Roux | SVUH Switch |
| Consultant Microbiologist | Dr Sinead McDermott | SVUH Switch |
| Chief Medical Scientist | Fiona Donohue | 6639868 |
| Quality Officer | Geraldine Lunney | SMH Ext 7388 |
| Haemovigilance Officer/ Anticoagulant Nurse | Kate Strathern | SMH Ext 7406 or Bleep |

| Specialist | | 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 - | SVPH Oncology Services only (Day Care |

| | | |
|---|---|---|
| | Oncology | Oncology, Infusion Suite, Cedar and Cara Wards)<br>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 request form.

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

Refer to Section 7.5 GP Stock Orders for ordering GP forms

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.

## 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

## Tube Guide & Recommended Order of Draw*

*Clinical and Laboratory Standards Institute (CLSI) Guidelines GP41-Ed7 (formerly H3-A6, 6th Edition)

### St. Vincents Healthcare Group, Dublin

Blood samples should be taken in the following order:

| Cap Colour | Cat. No. | Tube Type | Determinations | Special Instructions |
|---|---|---|---|---|
| | | Blood Cultures | If insufficient blood for both culture bottles, use aerobic bottle only. Using a safety butterfly needle, collect aerobic (green) bottle first and then the anaerobic (purple) bottle. If using a syringe, the anaerobic bottle is taken first and then the aerobic bottle.<br>Blood Culture bottles should be available on all wards. A supply is available from Microbiology Reception (Mon – Fri). | |
| | Cat. No.<br>363095/363093<br>Draw Volume<br>2.7ml / 1.8ml | Sodium Citrate | Coagulation Testing, PT, INR, APTT, Fibrinogen, D-Dimer, Thrombophilia Screens, Lupus Screens, Factor Assays. | Light blue capped Vacutainer tube with Sodium Citrate anticoagulant.<br>Mix 3-4 Times |
| | Cat. No.<br>367837<br>Draw Volume<br>6ml | Serum | Various specialised tests for Dispatch only. Please contact Laboratory. | Serum NON GEL - Red capped Vacutainer tube with clot activator.<br>Mix 5-6 Times |
| | Cat. No.<br>367954<br>Draw Volume<br>5ml | Serum Gel | UE, LFT, Cardiac Enzymes, 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, Growth Hormone, Vitamin D, Parathyroid Hormone, LH, FSH, Oestradiol, Progesterone, Prolactin, DHEAS, Testosterone, SHBG, Insulin Ionised Calcium, ADNA, Electrophoresis, Immunoglobulins (IgG, IgM,IgA,IgE), B2 Microglobulin, Ceruloplasmin,Thyroglobulin,Thyroid Ab, Infectious Mono, Liver Ab, Rheumatology, Coeliac Ab, Insulin Like growth Factor 1, C3/C4, Bone Markers, Osmolality LDH, NT-pro BNP, Drugs: Phenytoin; Theophylline; Methotrexate; Valproate; Carbamazepine; Paracetamol; Salicylate; Digoxin; Lithium; Tobramycin; Gentamicin; Vancomycin; Amikacin and Aldosterone. | Please send 2 samples if both Clinical Chemistry and Immunology tests are required.<br>Mix 6 Times |
| | Cat. No.<br>Draw Volume | Lithium Heparin | Various specialised tests for Dispatch only. Please contact Laboratory | Mix 8-10 Times |
| | Cat. No.<br>368774<br>Draw Volume<br>5ml | Rapid Serum Tube | The Vacutainer Rapid Serum Tube is to be used for very urgent samples only. | Mix 5-6 Times |
| | Cat. No.<br>368857<br>Draw Volume<br>3ml | EDTA | Full Blood Count (FBC), ESR, Blood films, Malaria screen, Chromogranin A, PRA, Plasma Renin Activity, Haemoglobin A1c, Homocysteine, ACTH, Sirolimus, Tacrolimus, Cyclosporin, PCR for CMV, HIV, EBV, Fluids for Cell Counts. | Homocysteine, ACTH Chromogranin A and PRA should be taken onto ice.<br>Mix 8-10 Times |
| | Cat. No.<br>Draw Volume | Crossmatch | Determinations: Group: Crossmatch. | Pink capped tube with potassium EDTA as anticoagulant.<br>Mix 8-10 Times |
| | Cat. No.<br>368920<br>Draw Volume<br>2ml | Fluoride Oxalate | Grey capped Vacutainer tube with Fluoride Oxalate anticoagulant.<br>Determinations: Glucose and Ethanol. | Mix 8-10 Times |
| | Cat. No.<br>368380/ 368381<br>Draw Volume<br>6ml | Trace Element | Serum (red stripe on side of label): Zinc, Copper and Selenium.<br>EDTA (blue band on side of label): Chromium and Cobalt. | Navy Cap with a red stripe on the side of the label for serum and blue band on the label for EDTA.<br>Mix 8-10 Times |

**Determinations and Special Instructions contained within this guide have been provided by the above 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.**

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 each tube 180° and back by the recommended number of times shown on the right hand side of the table.

BD Life Sciences - Preanalytical Systems
t: 0118 921 6000

BD, the BD Logo and all other trademarks are property of Becton, Dickinson and Company ©2017 BD.
PASUKTG.11.15.18v6

| 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<br>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<br>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)<br>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;<br>Do not add formaldehyde |
| Sterile plastic Universal Containers<br>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 | Available from Haematology for Bone Marrow Samples for |

| containers 30 mls | 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. 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.

### 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.

## 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.

# 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 Mr. Donal Murphy, Laboratory Manager.

## 12.5 Transport and Storage of Histological Samples

Samples may be taken in Theatre, endoscopy etc. and placed in appropriate sized containers or buckets containing fixative (usually formaldehyde). Please label the body of the container and request form with full patient and specimen details, use addressograph labels if possible. These 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.

Results of routine Haematology and Clinical Chemistry tests on GP samples will be available within 2 *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 U/E 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
CK, Troponin T (hs)
Beta HCG
Iron Studies
Lipid Profile (Cholesterol, Triglyceride, HDL)
Lithium, Phenytoin, Theophylline, Carbamazepine, Valproic Acid, Digoxin
Ethanol, Paracetamol, Salicylates
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<br>Ext. 4654 / 3828 (Laboratory),<br>Ext 3124 (Senior Room)<br>Ext. 4371(Med Res). |
| Haematology /Blood Transfusion/ Microbiologist Scientist On-Call | Bleep 465<br>Ext. 4785 / 4449 (Laboratory)<br>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 John Hill Ext. 6145.

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 there is continuity in the medical record and paediatric appropriate escalation. 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.

## 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 |

The laboratory will contact the requesting clinician team with the results and will indicate the urgency of the results. In the event of failure to contact a clinician, appropriate contingencies will be implemented to ensure that the result is communicated as far as possible. This may include contacting deputising service, mobile phone numbers 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 | | A | Phone to Haem team and GP if first presentation. |
| | | </= 9 | >/=19 | B | 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. |
| | | | >/=21 | B | Phone to Haem team and GP if first presentation. |
| WBC Count | X10 9/l | | >=30 | B | Unless previously high<br>Morphology follow up |
| Neutrophil count | X10 9/l | </=0.5<br></=1.0 | | A<br>B | Unless previously low |
| Lymphocytes | X10 9/l | | >/=50 | B | Unless previously high<br>Morphology follow up |
| Platelet count | X10 9/l | </=30 | | A | Phone to Haem Team and GP if first presentation |
| | | </=80 | | B | Unless previously low |
| | | | >=600 | B | Unless previously high |
| Blood Film | | | | A | ?Acute leukaemia*. ?TTP/HUS<br>Phone Haem Team<br>*also phoned by the Haem Team to the Clinician treating patient |
| INR | Secs | | >/=5.0<br>>=4.0 | A<br>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<br><br></= 7 | <br><br>>/=19<br><br>>/=21 | A<br><br>B<br><br>B | Phone to Haem team and Clinician if first presentation.<br><br>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.<br><br>Phone to Haem team and Clinician if first presentation |
| Neutrophil count | X10 9/l | </=0.5<br></=1.0 | | A<br>B | Unless previously low<br>except Oncology/Haem patient |
| Lymphocytes | X10 9/l | | >/=50 | B | Unless previously high<br>Morphology follow up |
| Platelet count | X10 9/l | </=30*<br><br></=80 | | A<br><br>B | Phone to Haem Team and Clinician if first presentation<br>Unless previously low |
| Blood film | | | | A | ?Acute leukaemia*<br>?TTP/HUS<br>Phone Haem Team<br>*also phoned by the HaemTeam to the clinician treating patient. |
| INR | Secs | | >/=5.0<br>>/=4.0<br>>/=8.0 | A<br>B<br>A | Unless previously high<br>Unless previously high<br>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 | If new for this episode |
| Potassium | Mmol/l | <=2.5 | >=6 | A | If new, notes on haemolysis |
| eGFR | Ml/min | <=15 | | A | New |
| Urea | Mmol/l | | >=30 | A | >=10 if <16yrs<br>If new, or increased significantly e.g. 100% (exc. Pre-post dialysis) |
| Creatinine | Umol/l | | >=354 | A | >=200 if <16yrs<br>If new, or increased significantly e.g. 100% (exc. Pre-post dialysis) |
| ALT | U/l | | 750 (>= ULN x15) | | If new |
| AST | U/l | | 600 (>=ULNx15) | B | If new. Add ALT if not requested |
| Adjusted Ca | Mmol/l | <=1.8 | >=3.0 | A | If new, unless consistent with a significantly low albumin |
| Phosphate (Inorganic $PO_4$) | Mmol/l | <=0.45 | | A | If new |
| Mg | Mmol/l | <=0.4 | | A | |
| TFTs | | | See comment | C | If new where:<br>SVUH:<br>TSH<0.1 and T3>4 and FT4 >30 Hyper)<br>OR TSH >50 and FT4 <5 (Hypo)<br>SVPH:<br>TSH<0.1 and FT3>7 and FT4 >30 Hyper)<br>OR TSH >50 and FT4 <5 (Hypo) |
| Amylase | U/l | | 500 (>=ULNx5) | A | If new |
| Carbamazepine | Mg/l | | >25 | B | If new, not urgent |
| Cortisol | Nmol/l | <=50 | | A | If new, if sample is early morning and if it is not part of a dexamethasone test, and if it is not form an Endocrine Consultant |
| CRP | Mg/l | | >=300 | A | If new |
| CK | U/L | | >=5000 | A | If new |
| Triglycerides | Mmol/l | | >=20 | B | If new |
| Digoxin | Ug/l | | >=2.5 | B | If new |
| Glucose | Mmol/l | <2.5 | >25.0 | A | |

| Lithium | Mmol/l | | >1.5 | B | If new, not urgent |
|---|---|---|---|---|---|
| Phenytoin | Mg/l | | >=25 | B | If new, not urgent |
| Vit B12 | Pg/l | <=150 | | B | If new |
| Troponin T (hs) | Ng/l | | 100 | A | If new, Notes on haemolysis |
| IgG | g/l | 3.0 | | C | If both IgA and IgM are low |
| Paraprotein | g/l | Any IgE/ IgD | IgG>15<br>IgA>10<br>IgM>10 | C | With low IgA and IgM |
| Ionised calcium | Mmol/l | 1.0 | 1.6 | A | If new |
| Theophylline | Mg/l | <2.0 | >25 | C | If new, not urgent |
| Paracetamol/ Salicylate/ | | | | A | Phone positive results only |
| Ethanol | Mg/dl | | >399 | A | |
| Iron | Umol/l | | >60 | A | If new, external patient |
| Valproate | Mg/l | | >100 | C | If new, not urgent, add LFT if elevated |
| Uric Acid | Umol/l | | >700 | A | If new, external patient |
| CSF Protein/ Glucose | | | | A | Phone all results except Neurology, 'normal results' |
| HCG | | | | A | If requested |
| PSA (Total) | Ug/l | | >10 | C | If new, and patient is not attending an oncologist or Urologist |
| CEA | Ug/l | | >20 | C | If new, and patient is not attending an oncologist or gastroenterologist or GI Surgeon |
| CA153 | KU/l | | >100 | C | If new, and patient is not attending an oncologist or breast screening unit |
| CA125 | KU/l | | >100 | C | If new, and patient is not attending an oncologist or gynaecologist |
| CA199 | KU/l | | >100 | C | If new, and patient is not attending an oncologist or gastroenterologist |
| Chromogranin A | Ng/ml | | 500 | C | If new, and patient is not attending an oncologist or gastroenterologist or NET Consultant |
| AFP | KU/l | | >20 | C | If new, and patient is not attending an oncologist, urologist or hepatologist |
| Blood Gases: | | | | | Phone All results |
| -Lactate | Mmol/l | | 3.0 | A | |
| -CoHB/ MetHb | | | | A | Phone all results |
| Oestradiol | | | >5000 | C | Unless patient is known to be pregnant |
| Procalcitonin | Ng/nl | | 10 | A | If new |

## 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)<br>P-ANCA (anti-MPO/PR3 positive)<br>A-ANCA (anti-MPO/PR3 positive) | B | New positive<br>(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<br>First time | g/L | IgG >15 g/L<br>IgA > 10g/L<br>IgM >10 g/L | C | Reported from Clinical Chemistry |

| | | IgD/IgE any level<br>Bence Jones protein* | | Immunology* |
|---|---|---|---|---|
| Paraneoplastic antibodies | | Positive | B | New positive |
| Anti-NMDA receptor antibodies | | Positive | B | New positive |
| Anti-MOG antibodies<br>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 | If positive on weekends, results will be phoned to GP on Monday |
| Device culture | Positive from a normally sterile site | C | If positive on weekends, results will be phoned to GP on Monday |
| Swab/ pus/ fluid aspirate | Unexpected result (unusual pathogen. MDRO) where patient likely to be on inappropriate empiric therapy | C | If positive on weekends, results will be phoned to GP on Monday |
| Joint fluid microscopy and culture care set | Positive gram stain or culture | B | JF will be phoned Mon-Fri to GPs. We do not receive JF at weekends from GPs |
| Legionella urinary ag | Positive | B | Leg Ur Ag will be phoned Mon-Fri. The test is not performed at weekends |
| Leptospirosis | IgM positive | C | If positive on weekends, results will be phoned to GP on Monday |
| Blood Culture | Clinically significant positive result | A/B as per HSE Irish guideline for the investigati | Clinical interpretation required.<br>Blood Cultures are not received by GPs. |

| | | on of blood culture samples | |
|---|---|---|---|

| Virology | | | |
|---|---|---|---|
| CMV | IgM positive. Low avidity IgG detected | C | Acute primary CMV<br>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<br>Oral fluid/ urine RNA positive | C | Phoned Mon-Fri - results do not send over weekend from NVRL |
| Rubella | IgM positive<br>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 09.00 am – 5.00pm Mon to Fri, 09.30am to 13.00pm Saturday and Sunday.
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 Transfuison 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 and Fibrinogen is stored in SMH Blood fridge. Advice can be sought from the Consultant Haematologist/On-call Haematologist.

#### 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 |
| | 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.

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

PATHOLOGY USER HANDBOOK
Edition 8 September 2023
(Document valid for 1 year from this date)

# 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 µmol/24hrs | 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 mls | 4 hrs | 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 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 |

| 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 |
| --- | --- | --- | --- | --- | --- | --- |
| | | | | | | Creatinine results. |
| ACTH | Blood | EDTA Lavender Cap 3 ml | 7 days Weekly | Early AM Range 7.2-63.3 ng/l<br><br>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.<br>ACTH levels greater than 2,000ng/L are reported as >2,000ng/L<br><br>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.<br>APCR | Blood | Sodium Citrate Light Blue cap 3 mls. | 4 – 6 weeks | 2.1 – 8.0 Ratio | Haematology | Tests done in batches unless requested urgently. See Thrombophilia Screen<br>Sample Stability: 4hrs post collection. |
| ADAMTS 13 Activity & Antibody<br>See Von Willebrand Cleaving Protease | Blood | Sodium Citrate Light Blue cap 3 mls x 2.<br>Serum for Ab Level. | 14 days | See Report | Haematology Referred | Samples must be sent immediately to the Coagulation lab for separation and freezing.<br>Specimens Referred to HSL Haemostasis Laboratory, London.<br>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 -70 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 |
| 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. |

| 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 - 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. |
| 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 5mls | 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.<br>It is therefore advised to have this test measured in the same laboratory for the duration of treatment and follow-up.<br>Method used – Roche Immunoassay<br>Most useful in germ cell tumours and hepatocellular cancer.<br>1 kU/L is equal to 1.21 ng/ml (Reference - UK NEQAS for AFP Literature Survey: Distribution 341)<br>Tumor marker results can used as an aid to cancer management but not as a case finding approach or general screen for cancer.<br>Biotin may cause some concentration dependent negative interference in this assay if high dose supplements are taken. If this is suspected, a repeat<br>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 5mls | 4 hrs | 9 - 59 U/L (male)<br>8 - 41 U/L (female) | Clinical Chemistry | Part of LFT profile.<br>If ordered alone and >123 U/L remaining LFTs added automatically by IT rule.<br>If ALT is >300 U/L, AST 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 |
|---|---|---|---|---|---|---|
| | | | | | | 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 5mls | 4 hrs | 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 20-200 ug/min, Macroalbuminuria > 200 ug/min | 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 Volume (L)) / Time (min)] x 1000 |
| Urine Albumin/Creatinine Ratio (ACR) | Urine | Universal Container Minimum urine collection volume is 5 mls. | 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 hrs | 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 5mls | 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. |
| ALK (NSCLC) Immunohistochemistry | Tissue/ Cytology | | 10 days | See Report | Histology | To request test phone 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 |
|---|---|---|---|---|---|---|
| ALP (Alkaline Phosphatase) | Blood | Serum Gold Cap 5mls | 4 hrs | 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.<br><br>Minimum retesting interval:<br>Not routinely required. |
| Allergen: Aspergillus Fumigatus | Blood | Serum Gold Cap 5mls | 10 days | 0.0 - 0.35 kU/L | Immunology | |
| Allergen: Cat dander | Blood | Serum Gold Cap 5mls | 10days | 0.0 - 0.35 kU/L | Immunology | |
| Allergen: Food Mix | Blood | Serum Gold Cap 5mls | 10days | Negative | Immunology | Food Mix Contains: egg white, milk, fish (cod), wheat, peanut, soyabean |
| Allergen: Dog dander | Blood | Serum Gold Cap 5mls | 10 days | 0.0 - 0.35 kU/L | Immunology | |
| Allergen: Egg white | Blood | Serum Gold Cap 5mls | 10days | 0.0 - 0.35kU/L | Immunology | |
| Allergen: Fish Mix | Blood | Serum Gold Cap 5mls | 14 days | Negative | Immunology | Fish Mix Contains: Cod, Shrimp, Blue Mussel, Tuna, and Salmon. |
| Allergen: Grass Mix | Blood | Serum Gold Cap 5mls | 14 days | Negative | 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 | 0.0 - 0.35 kU/L | Immunology | |
| Allergen: Latex | Blood | Serum Gold Cap | 10 days | 0.0 - 0.35 kU/L | Immunology | Specific IgE <0.35 does not exclude latex allergy. |

| 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 |
|---|---|---|---|---|---|---|
| | | 5mls | | | | |
| Allergen: Milk | Blood | Serum Gold Cap 5mls | 10 days | 0.0 - 0.35 kU/L | Immunology | |
| Allergen: Mould Mix | Blood | Serum Gold Cap 5mls | 14 days | Negative | Immunology | Mould mix contains: Penicillum C, Cladosporium H, Apergillus F, Candida A, Alternaaria A, Setomelanomma R |
| Allergen: Nut Mix | Blood | Serum Gold Cap 5mls | 10 days | Negative | Immunology | Nut Mix Contains: Peanut, Hazelnut, Brazil nut, Almond, and Coconut.<br>Specific IgE < 0.35 does not exclude nut allergy. |
| Allergen: Peanut | Blood | Serum Gold Cap 5mls | 10days | 0.0 - 0.35 kU/L | Immunology | |
| Allergen: Soya bean | Blood | Serum Gold Cap 5mls | 10 days | 0.0 - 0.35 kU/L | Immunology | |
| Allergen: Tree Mix | Blood | Serum Gold Cap 5mls | 14 days | Negative | Immunology | Tree Mix Contains: Box Elder, Silver Birch, Hazel, Oak, and Sycamore. |
| Allergen: Weed Pollen Mix | Blood | Serum Gold Cap 5mls | 14 days | Negative | 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 | 0.0 - 0.35 kU/L | Immunology | |
| Allergen: penicillin | Blood | Serum Gold Cap 5mls | 10 days | 0.0 - 0.35 kU/L | Immunology | |
| Other Allergens | Blood | Serum Gold cap 5mls | 14 days | 0.0 – 0.10 kU/L | Immunology | Specimens Referred to Eurofins Biomnis. |
| Alpha-1-Antitrypsin (A1AT) | Blood | Serum Gold Cap 5mls | 14 days | Age and gender related reference ranges.<br>See report | Immunology | Specimens Referred to Eurofins Biomnis.<br>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. |
| Alpha-1-Antitrypsin Phenotype ( A1AT) | Blood | Serum Gold Cap 5mls | 28 days | See report. | Immunology | Specimens Referred to Eurofins Biomnis. |

| Analyte / Investigation | Specimen Type | Container Type / Volume | Turn Around Time | Reference Interval (or clinical decision value) | Laboratory | Comments<br>Further Information is available from the laboratory or online at http://labtestsonline.org |
|---|---|---|---|---|---|---|
| α Galactosidase A | See Fabry | | | | | |
| Ammonia | Blood | LiHep Plasma Light Green Cap - 5ml - sent on ice, see comments. | 1 day | See Report | Clinical Chemistry Dispatch | The Patient sample must be taken into Lithium Heparin (light green cap) container *on ice*- for Temple Street.<br>Out of hours/weekend- the requesting ward/team refers the sample directly to Temple Street on ice. (Ice available 24/7 from theatre). |
| Amikacin | Blood | Serum Gold Cap 5mls | Daily | See Report | Clinical Chemistry | Samples must be analysed within 24 hours of collection.<br>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.<br>Trough level <5 mg/L Maintain dosing regimen.<br>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 5mls | 4 hrs | 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 5mls | weekly | Female: 1.7-4.6 nmol/L<br>Male : 1.0-5.3 nmol/L | Clinical Chemistry | Exemestan interferes and will significantly increase results. |
| Angiotensin Converting Enzyme (ACE) | Blood | Serum Gold Cap 5mls | 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. |
| Anti-Acetycholine Receptor (AChR) Antibody. | | | | | | |

| 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 see Myasthenic screen (Cluster antibodies). | | | | | | |
| Anti-Adrenal Antibody | Blood | Serum Gold Cap 5mls | 20 days | < 5 (titre) | Immunology | Specimens Referred to Eurofins Biomnis.<br>Anti-adrenal antibodies are found in patients with Addison's disease and also in patients with autoimmune polyglandular syndrome |
| Anti-AMPA 1 antibodies<br>Anti-AMPA 2 antibodies<br>Anti-GABAbR antibodies<br><br>All three tested together | Blood | Serum Gold Cap 5mls | 4-6 weeks | Negative | Immunology | Specimens Referred to Oxford University Hospital (UK).<br><br>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).<br>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)<br>ACA IgM (MPL-U/mL)<br><br>< 10 U/mL Negative<br>10-40 U/mL Equivocal<br>>40 U/mL Positive | Immunology | Assay includes IgG and IgM antibodies. |

| 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-Centromere Antibodies (ACM) | Blood | Serum Gold Cap 5 mls | 7 days | Negative | 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. |
| Anti-Cyclic Citrinullated Protein (CCP) antibody | Blood | Serum Gold Cap 5mls | 7 days | < 7 U/mL Negative<br>7-10 U/mL Equivocal<br>>10 U/mL Positive | Immunology | This antibody appears to be more specific (approximately 90%) for rheumatoid arthritis than rheumatoid factor.<br><br>Minimum retesting interval:<br>12 weeks |
| Anti dsDNA (EliA ) | Blood | Serum Gold Cap 5 ml | 7 days | <10 IU/mL Negative<br>10-15 IU/mL Equivocal<br>>15 IU/mL Positive | Immunology | Performed when ANA is positive with a titre of 1:400 or greater.<br><br>Minimum retesting interval:<br>Every 3–6 months while on treatment |
| Anti-double stranded DNA (dsDNA) antibodies (C. luciliae) | Blood | Serum Gold Cap 5mls | 10 days | Negative | Immunology | Performed as follow-up test in samples that are anti-dsDNA screen positive by immunoassay on Phadia250.<br>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 | 0 - 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<br><0.7 Ratio Negative<br>0.7-1.0 Ratio Equivocal<br>>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 |

| 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 |
|---|---|---|---|---|---|---|
| | | | | | | 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.<br><br>Minimum retesting interval:<br>Repeat testing of limited value – frequency to be determined by clinical context |
| Anti-Gastric Parietal Cell Antibodies (PCA) | Blood | Serum Gold Cap 5mls | 10 days | Negative | 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).<br>These antibodies are found in approximately 80% of newly diagnosed type 1 diabetes and in stiff man syndrome |
| Anti-Glomerular Basement Membrane (GBM) antibodies | Blood | Serum Gold Cap 5mls | 5 days | < 7 U/mL Negative<br>7 -10U/mL Equivocal<br>>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-GM1 antibodies (Ganglioside antibodies) | Blood | Serum Gold Cap 5mls | 4-6 weeks | Negative | Immunology | Specimens Referred to Oxford University Hospitals (UK).<br>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).<br>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.<br>Anti-insulin antibodies are found in approximately 30% of patients with type 1 diabetes.<br>Samples must be sent immediately to laboratory for separation |

| 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 |
|---|---|---|---|---|---|---|
| | | | | | | 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-Islet Cell Antibodies | Blood | Serum Gold Cap 5mls | 20 days | Negative | Immunology | Specimens Referred to Eurofins Biomnis. These antibodies are found in approximately 70% of patients presenting with Type 1 Diabetes. |
| Anti-LKM (Liver Kidney Microsomal) antibodies | Blood | Serum Gold Cap 5mls | 7 days | Negative | Immunology | Anti-LKM antibodies are associated with type II autoimmune hepatitis but may also be seen in hepatitis C. |
| 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 | 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 | 0 – 3.5 IU/ml<br>>5 IU/ml Positive<br>3.5-5IU/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.<br>P-ANCA with anti-MPO specificity occurs in 50-80% of patients with microscopic polyangitis (MPA), and in up to 20% of patients |

| Analyte / Investigation | Specimen Type | Container Type / Volume | Turn Around Time | Reference Interval (or clinical decision value) | Laboratory | Comments<br>Further Information is available from the laboratory or online at http://labtestsonline.org |
|---|---|---|---|---|---|---|
| | | | | | | with GPA<br><br>Minimum retesting interval:<br>On treatment: 6 months<br>Off treatment: annually |
| Anti Mullerian Hormone (AMH) | Blood | Serum Gold Cap 5mls | 10 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. |
| Anti-MuSK (Muscle specific kinase) antibodies.<br><br>Please refer to Myasthenic screen (Cluster antibodies). | | | | | | |
| 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.<br>**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<br>CSF not required although can be tested. | 5 days | Negative | 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- |

| 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 |
|---|---|---|---|---|---|---|
| | | | | | | 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.<br><br>Minimum retesting interval:<br>On treatment: 6 months<br>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<br>CSF 0.5 mL | 4-6 weeks | Negative | Immunology | Referred to Oxford University Hospital.<br>Paired serum and CSF are required |
| Anti-Nuclear Antibody (ANA) | Blood | Serum Gold Cap 5 mls | 7 days | Negative | Immunology | Samples are screened at 1/80 dilution. Staining pattern and titre are 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.<br><br>Minimum retesting interval:<br>Minimum retesting interval: every 6 months while on treatment . |
| Anti-phospholipase A2 receptor antibody | Blood | Serum<br>Gold-cap<br>5 mL | 10 days | 0 -14 RU/mL<br>Negative | Immunology | Referred to Protein Reference Unit, PO Box 894<br>SHEFFIELDS5 7YT<br>DX Number: DX6261402<br><br>Anti-phospholipase A2 receptor antibody are associated with adult idiopathic membranous nephropathy (MN), |

| 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-Phospholipid Antibodies - see Lupus Screen | | | | | | |
| Anti-PR3 | Blood | Serum Gold Cap 5mls | 5 days | 0 – 1.9 IU/ml<br><br>>3 IU/ml Positive<br><br>1.9 – 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)<br><br>Minimum retesting interval:<br>On treatment: 6 months<br>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<br>.<br>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 variants |
| Anti-Smooth Muscle Antibodies (SMA) | Blood | Serum Gold Cap 5mls | 7 days | Negative | 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. |

| 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-Striated muscle antibody | Blood | Serum Gold Cap 5mls | 2 weeks | Negative | Immunology | Specimens Referred to Eurofins Biomnis.<br>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 7-10U/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.<br><br>Minimum retesting interval:<br>3 months |
| Anti-Thyroglobulin antibodies | | | | | | See below under Thyroglobulin please |
| Anti-Thyroid Peroxidase (Anti-TPO) | Blood | Serum Gold Cap 5mls | 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.<br>High levels of Anti-TPO antibodies indicate current or future risk of autoimmune thyroid disease. Thyroid function tests should be checked.<br><br>Minimum retesting interval:<br>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.<br>See Thrombophilia Screen.<br>Sample stability = 4 hrs post collection. |
| Anti-TSH (Thyroid stimulating hormone) Receptor Antibodies | Blood | Serum Gold Cap 5mls | 14 days | < 1.75 IU/mL | Immunology | Specimens Referred to Eurofins Biomnis.<br>Associated with Grave's disease.<br><br>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. |

| Analyte / Investigation | Specimen Type | Container Type / Volume | Turn Around Time | Reference Interval (or clinical decision value) | Laboratory | Comments<br>Further Information is available from the laboratory or online at http://labtestsonline.org |
|---|---|---|---|---|---|---|
| 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).<br>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<br>70-130 pmol/L Equiv<br>>130pmol/L Positive | Immunology | Specimens Referred to Oxford University Hospitals (UK).<br><br>All VGKC antibody requests will be teste using a first line IIF (fluorescence) test for anti-LGI1 and CASPR2 antibodies.<br><br>CASPR2 and LGI1 are one of the VGKC-complex protiens.Anti-CASPR2 antibodies are found mostly in patients who have Morvan syndrome.<br>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.<br>Used to monitor certain patients on low molecular weight heparin.<br>Contact Coagulation laboratory (ext.4395) to pre-arrange assay.<br>Samples should be taken 4 hrs after last injection of Heparin.<br>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<br>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.<br>** 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<br>3 mls | Urgent 1.5hrs<br>Routine 4hrs<br>GP 2 working days | See report | Haematology* | One sample sufficient for PT, INR, APTT, APTT Ratio, D-Dimers and Fibrinogen.<br>Sample Stability: 4 hrs post collection. |
| APTT Ratio | Blood | Sodium Citrate Light Blue Cap | Urgent 1hr<br>Routine 4hrs | 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 |
|---|---|---|---|---|---|---|
| | | 3 mls | GP 2 working days | | | |
| 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 mins | pH = 7.35 - 7.45, $pCO_2$ (male) 4.6 - 6.4 kPa, $pCO_2$ (female) 4.3 - 6.0 kPa, $pO_2$ <60 yrs 11.0-14.4 kPa, $pO_2$ >60 yrs11.0-14.4 kPa Actual Bicarbonate 21-28 mmol/L Base Excess - 2 to + 3 , %O2 Saturation 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 5mls | 4 hrs | 11 – 34 U/L | Clinical Chemistry | 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 |
| 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 | 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 |
|---|---|---|---|---|---|---|
| | | | to Microbiology registrars | | | |
| Atypical Pneumonia Screen – see individual entries for Chlamydia and Mycoplasma. | | | | | | |
| Autopsies /Post Mortems | | | | Histology | See section 22 above | |
| 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 5mls | 7 days | 0.8 - 2.2 mg/L | Clinical Chemistry | |
| Bicarbonate - see | | | | | | |

| 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 |
|---|---|---|---|---|---|---|
| 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 µmol/L | Clinical Chemistry | Dispatched to Eurofins , Ideally Patient should be fasting for 8 hrs prior to sample collection. |
| Conjugated Bilirubin (Direct) | Blood | Serum Gold Cap 5mls | Daily (Mon-Fri) | 0-5 µmol/L | Clinical Chemistry | Direct (Conjugated) Bilirubin measurement is occasionally required but is not warranted if Total Bilirubin is < 35 µmol/L. Protect specimens from light. |
| Total Bilirubin | Blood | Serum Gold Cap 5mls | 4 hrs | 0- 21 µmol/L | Clinical Chemistry | For analyte stability, care should be taken to prevent exposure to light.<br>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<br>• Urgent (also see Liver Biopsy)<br>• Breast (Symptomatic & Breast Check)<br>- Prostate<br>- Lung<br>- Routine | Various tissue types | 10% Formalin | <br>5 days<br>5 days<br><br>7 days<br>5 days<br>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). |

| 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 |
|---|---|---|---|---|---|---|
| BK Polyomavirus PCR | Blood, urine | Serum Gold Cap 5mls<br>EDTA Lavender Cap. 3 mls<br>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.<br>Sample stability = 12hrs post collection. |
| BNP (proBNP) see NT-proBNP | Blood | Serum Gold Cap 5mls | Daily (Mon-Fri) | See Report | Clinical Chemistry | see NT-proBNP |
| 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 5mls | 4-6 Weeks | Female: 2.9 -14.5 □g/L, Male: 3.7 - 20.9 □□g/L | Clinical Chemistry | Bone Specific Alkaline Phosphatase assay exhibits up to 15% cross reactivity with Liver Alkaline Phosphatase |
| Bone Biomarker Profile: - Ionised Calcium<br>- PTH<br>- 25(OH)D<br>- P1NP (Procollagen Type 1 N-Propeptide) | Blood | Serum Gold Cap 5mls | 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.<br><br>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 |

| 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 |
|---|---|---|---|---|---|---|
| - Osteocalcin (OCI)<br>- Bone Alkaline Phosphatase (BAP)<br>- CTX-1 (C-Terminal cross-linking Telopeptide of type 1 Collagen) | | | | | | 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 |
| 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<br>CSF | Serum Gold Cap 5mls<br>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. |

| 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 |
|---|---|---|---|---|---|---|
| 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 5mls | Daily (Mon-Fri) | There is no reference interval for male patients.<br><br>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.<br>It is therefore advised to have this test measured in the same laboratory for the duration of treatment and follow-up.<br>Method used – Roche Immunoassay<br>Tumor marker results can used as an aid to cancer management but not as a case finding approach or general screen for cancer.<br>Biotin may cause some concentration dependent negative interference in this assay if high dose supplements are taken. If this is suspected, a repeat<br>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 5mls | Daily (Mon-Fri) | 0 - 40 kU/L | Clinical Chemistry | Most useful in breast cancer.<br>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.<br>It is therefore advised to have this test measured in the same laboratory for the duration of treatment and follow-up.<br>Method used – Roche Immunoassay<br>Tumor marker results can used as an aid to cancer management but not as a case finding approach or general screen for cancer.<br>Biotin may cause some concentration dependent negative interference in this assay if high dose supplements are taken. If this is suspected, a repeat<br>request 8 plus hours off Biotin is recommended in the first |

| Analyte / Investigation | Specimen Type | Container Type / Volume | Turn Around Time | Reference Interval (or clinical decision value) | Laboratory | Comments<br>Further Information is available from the laboratory or online at http://labtestsonline.org |
|---|---|---|---|---|---|---|
| | | | | | | instance. Please contact the Duty Scientist on Ext 3127 for further details. |
| CA 19-9 | Blood | Serum Gold Cap 5mls | Daily (Mon-Fri) | 0 - 37 kU/L | Clinical Chemistry | Most useful in pancreatic cancer.<br>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.<br>It is therefore advised to have this test measured in the same laboratory for the duration of treatment and follow-up.<br>Method used – Roche Immunoassay.<br>Tumor marker results can used as an aid to cancer management but not as a case finding approach or general screen for cancer.<br>Biotin may cause some concentration dependent negative interference in this assay if high dose supplements are taken. If this is suspected, a repeat<br>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 - 6 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 5mls | 3 days | 0.15-0.30 g/L (M)<br>0.16-0.45g/L (F) | Clinical Chemistry | |
| Urine Calcium (Urine Calcium Excretion) | Urine | 24 hrs urine bottle (plastic) - no preservatives required | Same day if received before 11am. | 2.5 - 7.5 mmol/24hr | 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. |

| 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 |
|---|---|---|---|---|---|---|
| | | OR spot urine<br>OR 2hr timed urine | | | | 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<br><br>Venous Ionised Calcium | Blood<br><br>Venous Blood gas sample | Serum Gold Cap 5mls/ Arterial blood gas sample<br><br>VBG | Daily | 1.15 - 1.33 mmol/L<br><br>1.16-1.32 mmol/l | Clinical Chemistry | Samples must be received on day of collection.<br><br>SVPH Endocrinologist by Special arrangement if clinically required: Please always send a separate sample for Calcium-Ionised. |
| Calcium | Blood | Serum Gold Cap 5mls | 4 hrs | 2.20 - 2.60 mmol/L | Clinical Chemistry | Avoid venostasis as it may cause inaccurate total calcium measurement. |
| Adjusted Calcium | Blood | Serum Gold Cap 5mls | 4 hrs | 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.<br><br>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.<br><br>Avoid venostasis as it may cause inaccurate total calcium measurement. |
| Calcium/Creatinine Ratio<br><br>(UCa/Creatinine Ratio) | Urine | 24hr urine, spot urine, 2 hour timed urine or 2nd morning void.* | 4 weeks | 0.07 - 0.41 | Clinical Chemistry | Part of Bone Biomarker Protocol available from the laboratory.<br>*Specimen container available from the 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 |
|---|---|---|---|---|---|---|
| Calcitonin | Blood | Serum – separate and freeze within 4 hours. | 2 weeks | <10 ng/l females<br><15 ng/l males | Clinical Chemistry Dispatch | Serum must be frozen within 4 hours of collection<br>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.<br>Referred to Eurofins Biomnis <18 years.<br>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<br>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).<br><br>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 | Serum Gold Cap 5mls | 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 5mls | Daily | 4 - 12 mg/L (Monotherapy),<br>4 - 8 mg/L (if polypharmacy is present). In combination therapy, the suggested therapeutic range for carbamazepine is lower: 4 - 8 mg/L. | Clinical Chemistry | Metabolism of Carbamazapine may be increased by Phenytoin and Phenobarbitone and is decreased in liver dysfunction.<br>The therapeutic range for carbamazepine is derived from the relationships between plasma level, seizure control and emergence of 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.<br>Samples must be analysed within 24 hours of collection. |
| Total CO2 (Carbon Dioxide) | Blood | Serum Gold Cap 5mls | 4 hrs | 22-29 mmol/L | Clinical Chemistry | Avoid small samples. |

| Analyte / Investigation | Specimen Type | Container Type / Volume | Turn Around Time | Reference Interval (or clinical decision value) | Laboratory | Comments<br>Further Information is available from the laboratory or online at http://labtestsonline.org |
|---|---|---|---|---|---|---|
| Carboxyhaemogloblin<br><br>(See also Methemoglobin) | Blood | Pre-heparinised blood gas syringe - 2ml<br><br>Venous Blood | 15 mins | 0.0-3.0 % Non-Smokers;<br><br>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.<br>Carboxyhaemogloblin can be measured on LiHep samples at the request of a GP – please contact laboratory |
| Catecholamines<br><br>Not available<br>See note opposite | Urine - 24hr collection | 24hr 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<br>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<br><br>Post Thaw viability | Blood<br><br>Stem Cells | EDTA<br>Lavender Cap 3 ml<br><br>Cryovial 2ml | 3 hours<br><br>3 hours | See Report | Haematology | Assayed pre peripheral blood stem cell processing.<br>Sample stability = 12hrs post collection<br><br>Assayed pre-reinfusion of stem cell harvest. Prior arrangement between Tissue establishment and Immunophenotyping required.<br>Sample stability = 3 hrs post collection |
| CD4 /CD8 T cells<br>See Lymphocyte subsets | | | | | | |
| CEA | Blood | Serum Gold Cap 5mls | Daily (Mon-Fri) | 0 - 3.5 µg/L | Clinical Chemistry | Most useful in colorectal cancer.<br>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.<br>It is therefore advised to have this test measured in the same laboratory for the duration of treatment and follow-up.<br>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 5mls | 4 hrs | 95 - 108 mmol/L | Clinical Chemistry | Part of Urea and Electrolytes Profile. |
| Urine Chloride Excretion | Urine - 24hr collection | 24hr urine bottle (plastic) - no preservatives required | Mon - Fri Same day if received before 11am | 20 - 125 mmol/24hrs | 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 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<br><br>(Please also see Lipid Profile) | Blood | Serum Gold Cap 5mls | 4 hrs | 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.<br>For lipid interpretation please see ESC/EAS guidelines for the management of dyslipidaemias. European Heart Journal (2019) doi.org/10.093/eurheartj/ehz455<br>"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. |

| 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 |
|---|---|---|---|---|---|---|
| | | | | | | 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 mLs | 6 days Only tested by prior arrangement | Male<br>5,320 – 12,920 U/L<br><br>Female<br><br>Age 16-39 (Not pregnant and not using hormonal contraceptives)<br><br>4,260-11,250 U/L<br><br>Age 18-41 (Pregnant or taking oral contraceptives)<br><br>3,650 – 9,120 U/L<br><br>Age > 40<br><br>5,320 – 12,920 U/L | Clinical Chemistry Despatch | Referred to Clinical Chemistry Laboratory, St James Hospital, Dublin. |
| Chromogranin A | Blood | EDTA Plasma | 6 days | <108 ng/ml | Clinical Chemistry | Plasma must be placed ON ICE and brought to the lab immediately. Samples currently dispatched to **Eurofins.** Patient should be Fasting. |
| Chromium | Blood | EDTA trace element tube (Navy top with blue band on tube) | 2 weeks | See Report | Clinical Chemistry Dispatch | Specimen 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 |
|---|---|---|---|---|---|---|
| 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<br>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 |
| 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/24hr | 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<br><br>CSF<br><br>BAL | EDTA 3mls<br><br>Sterile Universal container | 6 days blood/CSF<br><br>9 days BAL | See Report | Microbiology Dispatch | Referred to National Virus Reference Laboratory University College Dublin.<br><br>If sending other tests, send a separate EDTA sample for CMV PCR. |

| 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 |
|---|---|---|---|---|---|---|
| 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) | 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 5mls | 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. |
| 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 cap with red stripe on tube, or 2ml serum , Spun immediately and | 1 week | See Report | Clinical Chemistry Dispatch | Specimens 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 |
|---|---|---|---|---|---|---|
| | | refrigerated. | | | | |
| Copper (Urine) | Urine - 24hr collection | 24 hr 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 5mls | Daily (Mon-Fri) | See Report | Clinical Chemistry | State time of sample collection on request form.<br>Stress may elevate levels.<br>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 - 24hr 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<br>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.<br>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 <4 | 4-6 weeks | 0.2 - 3.2 µg/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 |
|---|---|---|---|---|---|---|
| | | hrs | | | | |
| CPE Screen | Rectal swab | Bacterial Transport swab | 96h | N/A | Microbiology | |
| CK (Creatine Kinase) | Blood | Serum Gold Cap 5mls | 4 hours | Male: 40-320 U/L<br>Female: 25-200U/L | Clinical Chemistry | Total CK may be elevated following IM injection. |
| Creatinine (Enzymatic) | Blood | Serum Gold Cap 5mls | 4 hours | Male: 59 – 104 µmol/L<br>Female: 45 - 84 µmol/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<br><br>24hr Urine bottle (plastic) - no preservatives required | Daily (Mon-Fri) | Early morning Urine<br>Male 3.5-24.6 mmol/L<br>Female 2.6-20.0 mmol/L<br><br>UCRE 24 hr:<br>Female 6-13 mmol/24hr<br>Male 9-19 mmol/24hr | Clinical Chemistry | Urinary volumes are reported in Litres. |
| Urine Creatinine Excretion | Urine - 24hr collection / Blood | 24hr Urine bottle - no preservatives required<br>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. |

| 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 |
|---|---|---|---|---|---|---|
| Crossmatch* | Blood | EDTA Pink Cap 6mls | 3 hrs* | | Blood Bank | *excluding patients with RBC antibodies. |
| C Reactive Protein (CRP) | Blood | Serum Gold Cap 5mls | 4 hrs | 0- 5.0 mg/l | Clinical Chemistry | CRP rises rapidly after onset of an acute phase response, beginning within 6 - 12 hrs and peaking within 24 - 48 hrs. 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. |
| Cryoglobulins<br><br>Cryoproteins include cryoglobulin or cryofibrinogen | Blood | 3 x Serum Gold Cap<br>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.<br><br>It is extremely important that the blood is collected and transported to the laboratory at 37º C.<br>A portable incubator is available in the Phlebotomy Dept on the ground floor for this purpose. |
| 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<br>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<br>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<br>Protein 14-3-3 | CSF | 2-5mls | 28 days | See Report | Microbiology<br>Dispatch | Referred to Beaumont Hospital<br>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 |

| 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 |
|---|---|---|---|---|---|---|
| | | | | | | must not be sent in the pod system. |
| CSF ACE (Angiotensin Converting Enzyme) | CSF | 0.5 ml of CSF in plain plastic container | | | 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 shall 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. |
| CSF Glucose | CSF | Fluoride Oxalate tube Grey Cap - 0.3ml (min) | 2 hrs | 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 shall be required |
| CSF Lactate | CSF | CSF specimen must be taken into a Sterilin container | 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 Eurofins Biomnis. CSF samples must not be sent in the pod system. CSF volumes required are stated per test , if more than one test is required more volume shall be required |
| CSF Protein | CSF | Sterile Universal Container - 0.3ml (min) | 2hrs | 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 |

| 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 |
|---|---|---|---|---|---|---|
| | | | | | | required more volume shall be required. |
| CSF Xanthachromia (Bilirubin)-Quantitative | CSF | Minimum 1 mL (Protected from light) taken at least 12 hrs post suspected SAH. Also Blood sample for Bilirubin and Total Protein. | | See Report | Clinical Chemistry Dispatch | Referred to Beaumont: 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 12 hrs post event.<br>Results can be followed up by contacting the Beaumont Hospital Pathology laboratory directly on 8092671/2678. Positive results will be phoned to the lab at SVUH who in turn will contact the requesting clinician.<br>CSF volumes required are stated per test , if more than one test is required more volume shall be required |
| CSF neurodegenerative markers:<br><br>CSF Total Tau<br>CSF A-β-42<br>CSF A-β-40<br>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<br><br>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.<br><br>Total Tau and phospho-tau will need to be requested separately, if required |
| CTX-1 (C-Terminal cross-linking Telopeptide of type 1 Collagen) | Serum | Serum Gold Cap 5mls | 20 days | Female:<br>0.150-0.635 ug/L<br><br>Male:<br>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.<br><br>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. |

| 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 |
|---|---|---|---|---|---|---|
| Cyclosoporin (Neoral, CYS) | Blood | EDTA / 3mls | 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 1Hr or early am Urine (10mls) frozen within 1Hr | 10 days | Adults:10 - 22 µmol/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 5mls | 21 days | See Report | Microbiology Dispatch | Referred to Hospital for Tropical Diseases, London |
| Cytochemistry | N/A | N/A | N/A | N/A | Haematology | No longer available. Replaced by Immunophenotyping. Please contact 4792 |
| 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.<br>Referred to Cytogenetics MLL (Munich), prev sen to Lab Crumlin.<br>Clinical details essential.<br>Monday to Friday samples for National / International dispatch MUST be down in the lab by 11:30 for same day referral.<br><br>**Exception** is INTERNATIONAL referrals, the last day/time for guaranteed delivery is THURSDAY 11.30AM.<br><br>Friday 11:30 AM for referral to Munich (MLL) ONLY.<br>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 | 0 - 0.5 FEU µg/ml | Haematology | Sample stability = 8 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 |
|---|---|---|---|---|---|---|
| | | | days | | | |
| 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 5mls | Daily | Reference intervals are not provided in those <16 years old.<br><br>Females:<br>16–19 yrs: 1.8 – 10.0 µmol/L<br>20–24 yrs: 4.0 – 11.0 µmol/L<br>25–34 yrs :2.7 – 9.2 µmol/L<br>35-44 yrs: 1.7 – 9.2 µmol/L<br>45-54 yrs: 1.0 – 7.0 µmol/L<br>55-64 yrs: 0.5 – 5.6 µmol/L<br>65–74 yrs: 0.3 – 6.7 µmol/L<br>>75yrs: 0.3 – 4.2 µmol/L<br><br>Males:<br>16–19 yrs: 1.9 – 13.4 µmol/L | Clinical Chemistry | Indicate age and gender.<br><br>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. |

| 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 |
|---|---|---|---|---|---|---|
| | | | | 20–24 yrs: 5.7 – 13.4 µmol/L<br>25–34 yrs: 4.3 – 12.2 µmol/L<br>35-44 yrs: 2.4 – 11.6 µmol/L<br>45-54 yrs: 1.2 – 9.0 µmol/L<br>55-64 yrs: 1.4– 8.0 µmol/L<br>65–74 yrs: 0.9 – 6.8 µmol/L<br>>75yrs: 0.4 – 3.3 µmol/L | | |
| Digoxin | Blood | Serum Gold Cap 5mls | Daily | 0.6 – 2.0 µg/L<br>0.6 – 1.2 µg/L in patients with heart failure | 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 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.<br>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 5mls | 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 6mls | 3 hrs | | Blood Bank | |
| Drugs of abuse (DOA): Opiate class, 6-acetylmorphine, | 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 |

| 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 |
|---|---|---|---|---|---|---|
| benzodiazepine class, 6-ethylidine-1,5-dimethyl-3,3-diphenylpyrrolidine (EDDP), cannabis class, cocaine and amphetamine class | | | | | | laboratory before 12.00 for same day dispatch.<br><br>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.<br>In line with best practice urine samples will have creatinine measured. Dilute urine samples may result in a false negative result. |
| Ear swab | Ear Swab | Bacterial Transport Swab | 48 - 96 hrs | 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. |
| Electron Microscopy<br>• Amlyloid EM subtyping<br>• Cilia Motiliy<br>• Renal biopsy for EM | 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 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 | Blood | Serum Gold Cap 5mls | 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 |

| 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 |
|---|---|---|---|---|---|---|
| Rate)<br><br>Please note: eGFR is calculated using the Chronic Kidney Disease Epidemiology Collaboration creatinine (CKD-EPI) equation) | | | | | | on gender and serum creatinine concentration.<br>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$^2$.<br><br>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.<br><br>4. For CKD classification, see KDIGO 2012 Clinical practice guideline.<br><br>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.<br>Specimens requiring special attention please inform the laboratory beforehand ( ext. 4350)<br><br>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 Red Cell membrane Studies(instead of | Blood | EDTA lavender cap 3mls @ room | 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 |
|---|---|---|---|---|---|---|
| Osmotic Fragility test) | | temperature | | | | |
| Enterovirus PCR – includes Coxsackie, Echo and Polio viruses | CSF, blood | Sterile Universal container<br>EDTA Lavender Cap. 3 mls<br>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.<br>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<br>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.<br>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.<br>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.<br>Sample stability = 6hrs post collection, 24 hours at 4oC<br>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 | 4 hrs | N/A | Clinical Chemistry | Results are not for medico-legal purpose.100 mg% ethanol is |

| Analyte / Investigation | Specimen Type | Container Type / Volume | Turn Around Time | Reference Interval (or clinical decision value) | Laboratory | Comments<br>Further Information is available from the laboratory or online at http://labtestsonline.org |
|---|---|---|---|---|---|---|
| | | Oxalate - Grey Cap. | | | | 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.<br>**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 for adequacy + needle rinse in Cytolyt* | Sent in slide tray | 5 days | | Cytology | These must be booked with the Cytopathologist. *Cytolyt available from Cytology. |
| Eye Swabs | Eye Swabs | Bacterial Transport Swab /Viral swab (liquid UTM – red top containers only) available from microbiology dept. | 48 - 96 hrs | N/A | Microbiology | Used for investigation of conjunctivitis. For Virus detection referred to NVRL.<br>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.Marys 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.<br>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<br>PCR/ C.diff Screen/ Ova & Parasites/ | Faeces | Sterile Universal Container with spoon (blue cap) – | PCR: 24-48 hrs<br>C.diff Toxin: same day* | 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 |

| 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 |
|---|---|---|---|---|---|---|
| Cryptosporidium | | pea sized sample required | O&Ps: up to 126 hrs | | | 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 |
| Ferritin | Blood | Serum Gold Cap 5mls | Daily (Mon-Fri) | Female: 13 - 150 µg/L Male: 30 – 400 µg/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. |
| 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 mls | 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 |

| 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 |
|---|---|---|---|---|---|---|
| | | | | | | 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.<br>Crumlin genetics request form required<br>Morphology report and Clinical details are essential |
| 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.<br>Crumlin genetics request form required.<br>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.<br>Referred to Molecular Diagnostic Laboratory, St. James Hospital.<br>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<br><br>For glucose; | Daily | Pleural/Pericardial fluid: Light's criteria for exudate one of<br>1. Fluid/serum protein ratio >0.5<br>2. Fluid/serum LDH ratio >0.6 | Clinical Chemistry | Use of serum tests in fluid samples has not been validated, is not CE marked and not INAB accredited.<br><br>The source of the fluid must be stated on the request form.<br>The collection time of the fluid must be stated on the request.<br>All effusions should be accompanied by a paired serum sample.<br>For non-viscous fluids which require pH, pH can be determined 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 |
|---|---|---|---|---|---|---|
| | | minimum of 1 mL fluid should be placed in a fluoride oxalate tube. Immediately bring to Biochemistry.<br><br>For pH; minimum of 1 mL should be transferred immediately to an ABG heparinised syringe with all air expelled. Immediately bring to Biochemistry. | | 3. Fluid LDH activity >2/3 of the serum LDH upper reference limit<br><br>Serum [albumin] – Fluid [albumin]<br>If >12 g/L; transudate<br>If ≤12 g/L; exudate<br><br>Fluid cholesterol >1.2 mmol/L; exudate<br>Fluid / serum cholesterol ratio > 0.3; exudate<br><br>Peritoneal (ascitic) fluid: Serum [albumin] – Ascitic fluid [albumin]<br>If ≥11 g/L; high portal pressure causes<br>If <11 g/L; normal portal pressure causes | | ward based blood gas analysers using appropriate heparinised syringes.<br>Blood contamination of fluid will contribute to the LDH activity measured and should be interpreted with this in mind.<br><br>Please Interpretation of Fluids results in Clinical Chemistry refer to section 16.0 in section 1 of the handbook :<br>16.0 REPORTING OF RESULTS, CLINICAL ADVICE AND INTERPRETATION |
| 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<br>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.<br>EDTA sample optimal for cell counts but is not suitable for crystals – sodium heparin or plain tube required. |
| Folate | Blood | Serum Gold Cap 5mls | 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.<br>Please state if patient is receiving folate supplements.<br>Vitamin B12 is added automatically by IT rule to all folate |

| 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 |
|---|---|---|---|---|---|---|
| | | | | | | requests.<br>If folate <3 µg/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.<br>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<br>Add on requests are not accepted due to stability issues. |
| Serum Free Light Chains<br><br>Kappa/Lamda Ratio | Blood | 2 mls Serum Red/ Gold Cap<br>Solely for SFLC. | 7 days | •Serum Free Kappa Light Chains: 3.30 – 19.40 mg/L<br>•Serum Free Lambda Light Chains; 5.71 – 26.3 mg/L<br>•SFLC Ratio: 0.26 – 1.65<br>•Reference Interval in renal impairment: 0.37 – 3.10 | Clinical Chemistry | Now measured in SVUH-Clinical Chemistry laboratory. |
| Free T4<br>(free thyroxine) | Blood | Serum Gold Cap<br>5mls | Daily (Mon-Fri) | 12.0 - 22.0 pmol/L | Clinical Chemistry | Usually used as a 2nd line reflex test to TSH.<br>Biotin may cause some concentration dependent positive interference in this assay if high dose supplements are taken. If this is suspected, a repeat<br>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<br>(Free Triiodothyronine) | Blood | Serum Gold Cap<br>5mls | Daily (Mon-Fri) | 3.1 - 6.8 pmol/L | Clinical Chemistry | Usually used as a 2nd line reflex test to TSH (and Free T4).<br>Biotin may cause some concentration dependent positive interference in this assay if high dose supplements are taken. If this is suspected, a repeat<br>request 8 plus hours off Biotin is recommended in the first instance. Please contact the Duty Scientist on Ext 3127 for further details. |

| 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 Testosterone Index<br><br>(Testosterone: SHBG ratio) | Blood | See Comment | 4 days | Reference intervals are not provided in females <20 years old.<br>Female<br>20-49 yrs: 0.3-5.6<br>≥50 yrs: 0.2-3.6 | Clinical Chemistry | This is a calculated test generated on females only. See testosterone and SHBG for specimen requirements.<br><br>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/serum | 1 week | See Report | Clinical Chemistry Dispatch | Referred to Rotunda Hospital |
| Follicle Stimulating Hormone (FSH) | Blood | Serum Gold Cap 5mls | Daily Mon-Fri | Male: 2 - 12 U/L<br><br>Female:<br>Follicular 4 - 13 U/L<br>Mid Cycle 5 - 22 U/L<br>Luteal 2 - 8 U/L<br>Post Menopause 26 - 135 U/L | Clinical Chemistry | State LMP.<br>Biotin may cause some concentration dependent negative interference in this assay if high dose supplements are taken. If this is suspected, a repeat<br>request 8 plus hours off Biotin is recommended in the first instance. Please contact the Duty Scientist on Ext 3127 for further details.<br>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.<br>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. |
| Full Blood Count – FBC [WBC, Hb, RBC, HCT, MCV, MCH, RDW, Platelet count, White | Blood | EDTA<br>Lavender Cap<br>3 mls | Routine 4hrs.<br>Urgent 1.5hr<br>GP/OPD-48hours | See report | Haematology* | Differential included in Full blood count during routine hours.<br>Available by request only out of hours.<br>Sample stability = 24hrs 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 |
|---|---|---|---|---|---|---|
| Cell Differential + NRBC] | | | | | | |
| 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 5mls | 4 hrs | Male: 12 - 68 U/L<br>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 3mls | 7days | See report | Clinical Chemistry Dispatch | To be brought to Clinical Chemistry Laboratory within 45mins of collection referred to Belfast. |
| Gastrointestinal (GI) Biopsy<br>- Urgent<br>- Bowel Screen<br>- Routine | Tissue | 10% Formalin | <br><br>5 days<br>5 days<br>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. |
| 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 Pod1,St.Marys Hospital Oxford,Manchester, blood to be sent as soon as possible to the lab as analysis is required within 3 days of collection. |
| 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). Ensure correct consent is obtained , fully |

| 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 |
|---|---|---|---|---|---|---|
| | | | | | | completed and **signed by the Consultant** only , please contact the laboratory. |
| 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 5mls | Daily | See Comments for Therapeutic Range | Clinical Chemistry | Samples must be analysed within 24 hours of collection.<br>All requests for gentamicin will have a creatinine measured automatically by IT rule.<br><br>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.<br><br>Trough level <1 mg/L Maintain dosing regimen.<br>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.<br>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 and VIP) | 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. |

| Analyte / Investigation | Specimen Type | Container Type / Volume | Turn Around Time | Reference Interval (or clinical decision value) | Laboratory | Comments<br>Further Information is available from the laboratory or online at http://labtestsonline.org |
|---|---|---|---|---|---|---|
| Giardia Abs | Blood | Serum/ 5-10ml | 10 days | N/A | Microbiology Dispatch | Referred to Hospital for Tropical Diseases London. |
| Calculated Globulin<br><br>(Please also see ALB (Albumin) and Total Protein) | Blood | Serum Gold Cap 5mls | 4 hrs | 25 to 40 g/L | Clinical Chemistry | Calculated Globulin is reported where serum Albumin and serum Total Protein are measured. |
| Glucose<br><br><br><br><br>Glucose (Point of –care, Glucometer) | Blood<br><br><br><br><br>Blood | Fluoride Oxalate (Grey topped vacutainer) – 2mls<br><br>Whole Blood | 4 hrs | 4.0 - 6.0 mmol/L (Fasting)<br><br><br><br><br>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.<br><br>The source of the fluid must be stated on the request form.<br>The collection time of the fluid must be stated on the request.<br>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.<br>FBC results should be included with sample. |
| Glucose Tolerance Test (GTT) | Blood - Fasting & 2 hour post 75g glucose | Fluoride Oxalate Grey Cap 2mls | 7 hr | Diabetes Mellitus: Fasting ≥7.0 mmol/L and/or 2hr post glucose | 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 |

| 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 |
|---|---|---|---|---|---|---|
| | load | | | load ≥11.1 mmol/L Impaired Glucose Tolerance (IGT): Fasting <7.0 mmol/L and/or 2hr post glucose load ≥7.8 and < 11.1 mmol/L Impaired Fasting Glycaemia (IFG): Fasting ≥ 6.1 and < 7.0 mmol/L | | 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 2hr pp specimen. |
| 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 repeat 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 regards 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 |

| 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 |
|---|---|---|---|---|---|---|
| HbA1c HPLC ( EDTA) | Blood | EDTA Lavender Cap 3 ml Please send a separate EDTA sample 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 F/Abnormal HB's or Haemoglobin electrophoresis | 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. |
| 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 | N/A | Microbiology Dispatch | Referred to IMMRL, Temple Street |

| 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 |
|---|---|---|---|---|---|---|
| | | | before 11.00 | | | |
| 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.<br>Referred to Eurofins Biomnis |
| hCG (Pregnancy test) | Blood | Serum Gold Cap 5mL | Daily | Female:<br>Non-pregnant pre-menopausal <5.3 IU/L<br>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.<br>Serum hCG can be requested out-of-hours.<br><br>hCG levels may remain detectable for up to several weeks following delivery, miscarriage or hCG injections (IVF).<br><br>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. Samples reported as borderline (between 5 and 25 IU/L) are considered indeterminate and need to be repeated 48-72 hrs later | Clinical Chemistry | Siemens Healthcare Diagnostic hCG Pregnancy Test is a qualitative method for the rapid detection of hCG in urine.<br>We recommend sending a serum sample as the result will be positive before the urine hCG result.<br>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 48 hrs later. In acute situations the results can be confirmed with a serum hCG result. . |

| 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 |
|---|---|---|---|---|---|---|
| | | | | | | 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:<br>Non-pregnant pre-menopausal <5.3 IU/L<br>Post-Menopausal <8.3 IU/L<br><br>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.<br>It is advised to have this test measured in the same laboratory for the duration of treatment and follow-up.<br><br>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.<br>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<br><br>(Please also see Lipid Profile) | Blood | Serum Gold Cap 5mls | 4 hrs | N/A | Clinical Chemistry | Venepuncture should be performed prior to the administration of Metamizole as metabolites may cause interference with analysis.<br>For lipid interpretation please see ESC/EAS guidelines for the management of dyslipidaemias. European Heart Journal (2019) doi.org/10.093/eurheartj/ehz455<br>"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 |
|---|---|---|---|---|---|---|
| Heinz Bodies | Blood | EDTA Lavender Cap 3mls | 24 hours | See Report | Haematology | One tube sufficient for FBC and Heinz bodies. Sample stability = 1 hr post collection. Bring to the laboratory immediately. |
| 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. |

| 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 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. |
| 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<br>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<br>NPA<br>BAL<br>Urine | Red top liquid viral swab<br>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<br>Blood from immuno-compromised | CSF<br>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<br>Tissue | Sterile Universal container | 9 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 |
|---|---|---|---|---|---|---|
| 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 registrars | 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 |
| 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. |

| 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 Kidney Transplant | Blood | 1 x Sodium Citrate (3 mls) + 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 mls) + 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 mls) + 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 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 | 0 – 15 years<br>0 to less than 10 umol/L<br>15-65 years<br>0 to less than 15 umol/L<br>>65 years<br>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 preAge, pregnancy, and renal function are important. The intake of folic acid as either supplements or through fortification of foods must also be considered. Include pregnancy threshold<br>Group Folate supplemented Nonsupplemented<br>Fasting/basal tHcy, µmol/L<br>Pregnancy 8 10<br>Children < 15 years 8 10<br>Adults 15‑65 years 12 15<br>Elderly > 65 years 16 20<br>Each laboratory should investigate the transferability of the expected values .<br>Refsum H, Smith AD, Ueland PM, et al. Facts and Recommendations about Total Homocysteine Determinations: An |

| 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 |
|---|---|---|---|---|---|---|
| | | | | | | Expert Opinion. Clin Chem 2004;50(1):3-32.viously measured'. |
| 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. |
| 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 5mls | Daily | 1.5-6.9 pg/ml | Clinical Chemistry | |
| Insulin like Growth Factor 1 (IGF-1) | Blood | Serum Gold Cap 5mls | 7 days | Reference intervals are not provided in those <16 years old. | Clinical Chemistry | Provide age and gender. No reference intervals available for persons >80 years, values for age 75-80 given and comments added to state range not verified for >80. |

| Analyte / Investigation | Specimen Type | Container Type / Volume | Turn Around Time | Reference Interval (or clinical decision value) | Laboratory | Comments<br>Further Information is available from the laboratory or online at http://labtestsonline.org |
|---|---|---|---|---|---|---|
| | | | | Females:<br>16 -17 yr: 270 - 660 µg/L<br>17 -18 yr: 246 - 533 µg/L<br>18 -19 yr: 233 - 499 µg/L<br>19 -20 yr: 220 - 471 µg/L<br>20 -30 yr: 115 - 340 µg/L<br>30 -40 yr: 109 - 324 µg/L<br>40 -50 yr: 103 - 310 µg/L<br>50 –60 yr: 97 - 292 µg/L<br>60 –70 yr: 91 - 282 µg/L<br>70 –80 yr: 47 - 207 µg/L<br>>80 yr: 40 - 184 µg/L<br>Males:<br>16 -17 yr: 267 - 673 µg/L<br>17 -18 yr: 243 - 527 µg/L<br>18 -19 yr: 235 - 512 µg/L<br>19 -20 yr: 220 - 471 µg/L<br>20 -30 yr: 115 - 340 µg/L<br>30 -40 yr: 109 - 324 µg/L<br>40 -50 yr: 103 - 310 µg/L<br>50 – 60yr: 97 - 292 µg/L<br>60 –70 yr: 91 - 282 µg/L<br>70 – 80 yr: 47 - 207 µg/L<br>>80 yr: 40 – 184 µg/L | | No RI for <16 yrs, on Apex we use NA (NOT AVAILABLE) and a comment stating RI not available. |
| Immunofixation<br>1. Serum<br>2. Urine | Blood<br>Urine | Serum Gold Cap 5 mL<br>Urine 20 mL | Serum 21days<br>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. |

| Analyte / Investigation | Specimen Type | Container Type / Volume | Turn Around Time | Reference Interval (or clinical decision value) | Laboratory | Comments<br>Further Information is available from the laboratory or online at http://labtestsonline.org |
|---|---|---|---|---|---|---|
| IgE (Immunoglobulin E) | Blood | Serum Gold Cap 5mls | 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.<br>Biotin may cause some concentration dependent negative interference in this assay if high dose supplements are taken. If this is suspected, a repeat<br>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)<br>IgM (Immunoglobulin M)<br>IgA) (Immunoglobulin A) | Blood | Serum Gold Cap 5mls | 3 Days | IgG: 8 - 15 g/L,<br><br>IgM: 0.4 - 2.4 g/L,<br><br>IgA: 0.9 - 4.3 g/L | Clinical Chemistry | In line with good practice internationally, serum protein electrophoresis may be performed as a result of abnormal immunoglobulin concentrations, for example, one or more high and/or low immunoglobulin concentrations. The presence of high concentration of paraproteins may result in overestimation of the respective immunoglobulin class. |
| Immuno-phenotyping | Blood<br><br>Bone marrow<br><br>Pleural Fluid | EDTA x 1 (3 mls )<br><br>Bone marrow/Pleural Fluid (** Heparinised in RPMI ) | 14 days | See Report | Haematology | Provisional results available within 48hrs.<br>Immunophenotyping request forms available in Laboratory.<br>** Specimen containers available from Haematology.<br>Consult Haematology Medical Team for Immunophenotyping requests. Prior arrangement with lab (4792) is essential.<br>Pre-booking of pleural fluids is required as TB testing is mandatory prior to resting.<br>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 |
| Infectious Mononucleosis screen (previous names | 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 |

| Analyte / Investigation | Specimen Type | Container Type / Volume | Turn Around Time | Reference Interval (or clinical decision value) | Laboratory | Comments<br>Further Information is available from the laboratory or online at http://labtestsonline.org |
|---|---|---|---|---|---|---|
| Monospot / Paul Burnell) | | | | | | four years of age may fail to produce this antibody.<br>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:<br>COVID-19 (SARS-CoV-2)<br>Influenza A<br>Influenza B<br>RSV | Nasopharyngeal / deep throat swab | Liquid Viral Swab eNAT swab (blue top) 2ml | Rapid test: 12 hrs<br>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.<br>Tests will only be performed between 08.00 and 19.20 Mon-Fri, and between 09.30 and 12.00 Sat and Sun.<br>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:<br>Influenza A<br>Influenza B<br>Influenza H1N1 (Swine flu) | Sputum, NPA, throat wash, respiratory secretions<br><br>Nasopharyngeal / Nasal and throat swab liquid viral UTM (red top container) | Sterile Universal container<br><br>Viral swab (liquid viral UTM – red top container) | 7 days in season<br>9 days out of season<br><br>Positive results are phoned to Microbiology team | N/A | Microbiology Dispatch | Referred to National Virus Reference Laboratory University College Dublin.<br>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 1.5hr<br>Routine 4hrs<br>GP – 2 working days | See Report | Haematology* | Used for warfarin monitoring.<br>One sample sufficient for PT, INR, APTT, APTT Ratio, D-Dimers and Fibrinogen.<br>Sample stability = 24hrs 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 |
|---|---|---|---|---|---|---|
| Insulin | Blood | Serum Gold Cap 5mls | 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 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<br><br>including Iron, Transferrin, TIBC (calculated),% Iron Binding Saturation, transferrin saturation (calculated) | Blood | Serum Gold Cap 5mls (for all Iron Status tests) | 4 hrs | 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 |

| 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 |
|---|---|---|---|---|---|---|
| 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<br>CSF<br>Fresh urine | Serum Gold Cap 5mls or<br>EDTA Lavender Cap 3mls<br>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.<br><18 yrs old: Specimen referred to Crumlin<br>Consent form must be filled out. Not available to GP's. |
| Keppra (Levetiracetam) | Blood | Serum Red Cap 5mls | 14 days | 10-40 mg/L | Clinical Chemistry Dispatch | Referred to Eurofins Biomnis<br>Non-gel serum is required frozen within 4hours of receipt in laboratory.<br>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 mins | 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 5mls | 4 hrs | 135-250 U/L | Clinical Chemistry | |
| Lamictal/Lamotrigine | Blood | Serum Red Top 1ml | 7 days | | Clinical Chemistry | 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 |
|---|---|---|---|---|---|---|
| | | | | | Dispatch | Non-gel serum is required frozen within 4hours of receipt in laboratory |
| LDL Cholesterol (calculated) (Please also see Lipid Profile) | Blood | Serum Gold Cap 5mls | 4 hrs | 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." |
| Lead | Blood | Li-Heparin whole blood/EDTA whole blood. | 4 months | <0.5 µmol/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 |

| 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 |
|---|---|---|---|---|---|---|
| Levetiracetam (Keppra) | Blood | Serum Red Cap 5mls | 14 days | 10-40 mg/L | Clinical Chemistry Dispatch | Referred to Eurofins Biomnis<br>Non-gel serum is required frozen within 4hours of receipt in laboratory.<br>Therapeutic range provided applies to a trough level. |
| Luteinising Hormone (LH) | Blood | Serum Gold Cap 5mls | Daily Mon-Fri | Male: 2 - 9 U/L,<br>Female:<br>Follicular 2 -13 U/L, Mid Cycle 14 - 96 U/L,<br>Luteal 1 - 11 U/L<br>Post Menopause 8 - 59 U/L | Clinical Chemistry | State LMP.<br>Biotin may cause some concentration dependent negative interference in this assay if high dose supplements are taken. If this is suspected, a repeat<br>request 8 plus hours off Biotin is recommended in the first instance. Please contact the Duty Scientist on Ext 3127 for further details.<br>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.<br>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 5mls ( amylase ) | 4 hrs ( amylase ) | See Report | Clinical Chemistry | Amylase is now measured instead of Lipase to prevent delay in diagnosis of Pancreatitis. Lipase not routinely available. |
| Lipids<br>Includes Cholesterol, HDL Cholesterol, non-HDL Cholesterol, Calculated LDL Cholesterol, Triglycerides, T.Chol/HDL Ratio (Total Cholesterol/HDL Ratio) | Blood | Serum Gold Cap 5mls | 4 hrs | 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 |
|---|---|---|---|---|---|---|
| Lipoprotein a<br><br>Please see note opposite | Blood | Serum Gold Cap 5mls | 1 week | See Report | Clinical Chemistry Dispatch | Referred to external lab. (Eurofins Biomnis).<br>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 5mls | 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.<br>Samples must be analysed within 24 hours of collection.<br><br>All requests for lithium will have a creatinine measured automatically by IT rule.<br>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:<br>• For tumour diagnosis only<br>• Medical liver biopsy | Liver biopsy tissue | 10% Formalin in container of adequate size | <br>5 days<br><br>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)<br>Bring to lab immediately | Dry in 60mls container.<br>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:<br>▪ 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 (LFT's) includes albumin, total bilirubin, alkaline phosphatase, GGT, ALT | Blood | Serum Gold Cap 5mls | 4 hrs | See under individual tests | Clinical Chemistry | If AST analysis is also required, please state on request form. |
| Lupus Screen<br><br>(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.<br>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%,<br>Helper T CD4 35-60%,<br>Cytotoxic T CD8+ 18-49%,<br>T cells 797-2996 x10^6/L, Helper | Immunology | Specimens Referred to Immunology Dept, St. James' Hospital.<br><br>Please state time of collection on request form.<br><br>EDTA samples for Lymphocyte subsets should arrive in SJH Immunology within 24 hours 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 |
|---|---|---|---|---|---|---|
| | | | | T 502-1749 x10^6/L, Cytotoxic T 263-1137 x10^6/L B cells CD19 5-19% B cells CD19 99-618 x10^6/L NK cells 4-24% NK cells 72-577 x10^6/L | | Specimens must be delivered to Immunology before 12:30 pm (Mon - Fri). |
| Macroprolactin | Blood | Serum Gold Cap 5mls | 10 Days | See prolactin minus macroprolactin | Clinical Chemistry | See prolactin minus macroprolactin. |
| Magnesium | Blood | Serum Gold Cap 5mls | 4 hrs | 0.7 - 1.0 mmol/L | Clinical Chemistry | |
| Urine Magnesium Excretion | Urine - 24hr collection | 24hr urine bottle (plastic) - no preservatives required | Daily Mon – Fri. Same day if rec'd before 11am | 3.0-5.0 mmol/24hr | 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.<br><br>Urine creatinine is added to all urine magnesium requests automatically by IT rule.<br>Urinary volumes are reported in Litres. |
| Urine Magnesium | Urine - Fresh spot | Sterile Universal Container - 5ml (min) | 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 = 4 hours 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 |
|---|---|---|---|---|---|---|
| Measles Abs | Blood<br>Oral fluid | Serum Gold Cap 5mls<br>Sterile Universal container<br>Oracol collection device (available from NVRL) | 8 days | See Report | Microbiology Dispatch | Referred to National Virus Reference Laboratory University College Dublin. |
| Measles PCR | CSF<br><br>Blood<br><br>Saliva | Sterile Universal container<br>Serum Gold Cap 5mls<br>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 of CSF (see relevant CSF section) | Positive results phoned same day 16.00 -17.00 if received before 11am | 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 same day results. |
| Mercury | Blood or Urine | 5 mls of EDTA blood or 10 mls random Urine | 28 days | See Report | Clinical Chemistry Dispatch | Referred to Eurofins Biomnis. No pretreatment of urine required. |
| Metabolic Profile | Blood or Urine | Serum or 5 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.<br>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. |

| 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 |
|---|---|---|---|---|---|---|
| Metanephrines (Urine<br><br>Alternative method | Urine - 24hr collection | 24hr urine collection - acid containing bottle obtainable from Clinical Chemistry Laboratory *<br><br>2ml urine x3 aliquots, non-acidified & frozen | 15 days<br><br>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.<br><br>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 .<br><br>This is an alternative method for providing aliquots to the requirements at present re- Acidified 24 hr containers |
| Methanol | Blood | Serum red top | | | | Referred to Eurofins Biomnis, frozen within 4 hours. |
| Methemoglobin | Arterial or Venous Blood | Pre-heparinised blood gas syringe - 2ml. Ensure no air present. | 15 mins | 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 hrs | 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 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. |

| Analyte / Investigation | Specimen Type | Container Type / Volume | Turn Around Time | Reference Interval (or clinical decision value) | Laboratory | Comments<br>Further Information is available from the laboratory or online at http://labtestsonline.org |
|---|---|---|---|---|---|---|
| Methylmalonic Acid ( MMA) | Blood | Serum | | | | Frozen < 1HR ( 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<br>Solid tumour testing<br>(in house test)<br><br>NGS Panels:<br>Breast,<br>Cholangiocarcinoma,<br>Colorectal,<br>GIST,<br>Lung,<br>Melanoma,<br>Pancreatic,<br>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<br>Solid tumour testing<br>(external test)<br><br>ALK-FISH,<br>BRCA,<br>COL1A2-PDGFB fusion FISH,<br>EWSR1 FISH,<br>MDM2 FISH,<br>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.<br><br>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. |

| 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,<br>Solid tumour cancer panels (e.g. extended NGS lung panel, Oncomine),<br>TCR Gene Rearrangements,<br>TX18 translocation studies,<br>USP6-MYH9 RT-PCR. | | | | | | |
| Mouth swab | Mouth swab | Bacterial Transport Swabs | 48 hrs - 96 hrs | N/A | Microbiology | |
| MRSA Screen<br>Culture for MRSA | Nasal Swab<br>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.<br>Specify which tests of the MPN panel are required in the request form. |
| Myasthenic screen (Cluster antibodies). Includes antibodies to AChR, MuSK and LRP4 antibodies. | Blood | Serum Gold Cap 5mls | 4-6 weeks | Negative | Immunology | Specimens Referred to Oxford University Hospitals (UK).<br>These antibodies are measured by cell-based assay and is more sensitive than conventional methods (RIA & ELISA).<br>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.<br>Anti-MuSK antibodies are found in approximately 40% of patients with myasthenia gravis with negative anti-acetylcholine receptor antibody. |

| Analyte / Investigation | Specimen Type | Container Type / Volume | Turn Around Time | Reference Interval (or clinical decision value) | Laboratory | Comments<br>Further Information is available from the laboratory or online at http://labtestsonline.org |
|---|---|---|---|---|---|---|
| Myositis panel | Blood | Serum Gold Cap 5mls | 14 days | See report | Immunology | Specimens referred to Eurofins Biomnis.<br>These antibodies are associated with polymyositis, Raynaud's phenomenon, lung fibrosis, articular pain and palm hyperkeratosis. |
| Mumps Abs | Blood<br>Oral fluid | Serum Gold Cap 5mls<br>Sterile Universal container<br><br>Oracol collection device (available from NVRL) | 9 days | See Report | Microbiology Dispatch | Referred to National Virus Reference Laboratory University College Dublin.. |
| Mumps PCR | CSF<br>Oral fluid<br>Urine<br>Throat swab | Sterile Universal container<br>Viral swab- (ORACOL swab required)<br>Contact microbiology lab | 11 days | See Report | Microbiology Dispatch | Referred to National Virus Reference Laboratory University College Dublin.<br>ORACOL swabs are required. Please contact microbiology lab<br>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. Bring to the laboratory immediately. SVPH arrange their own transport. |
| Mycobacteria – see TB specimens | | | | | | |
| Mycology Specimens (Superficial)<br>Microscopy & Culture | Skin / Hair/ Nails | Sterile Universal Container | Microscopy: 3-10 days<br>Fungal Culture: 3-5 weeks | N/A | Microbiology | All significant positive results are phoned to the team/ clinician when confirmed.<br>Use Yellow microbiology 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 |
|---|---|---|---|---|---|---|
| Mycology Specimens (other than superficial) Microscopy & Culture | Specimens other than skin / hair/ nails | Sterile Universal Container | Microscopy: 3-5 days Fungal Culture: 48h-10days | N/A | Microbiology | All significant positive results are phoned to the team/ clinician when confirmed.<br>Use Yellow microbiology form |
| Mycophenolate (Cellcept) | Blood | EDTA Lavender Cap 3mls | 28 days | | Immunology | Specimens Referred to Harefield Hospital (UK).<br>**Bring samples to the laboratory as soon as possible. Plasma must be separated within 24 hrs.<br>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. |
| 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 |

| Analyte / Investigation | Specimen Type | Container Type / Volume | Turn Around Time | Reference Interval (or clinical decision value) | Laboratory | Comments<br>Further Information is available from the laboratory or online at http://labtestsonline.org |
|---|---|---|---|---|---|---|
| | | | | | | 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 3mls 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 - 24hr collection | 24hr urine bottle - (plastic). No preservatives required | Daily (Mon-Fri) | 7 - 10g/24hr (stable non-catabolic state) Up to 20 - 30g/24hrs 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 (N-terminal pro B Natriuretic Peptide ) | Blood | Serum Gold Cap 5mls | Mon-Fri within 2 routine working days Note:GP samples received on Friday may not be analysed until Monday (Tuesday following a Bank Holiday weekend). | see comments | Clinical Chemistry | ESC Heart Failure( HF) Guidelines (2008)<br>In Untreated Patients with symptoms suggestive of HF:-<br>NT-proBNP < 400 pg/ml indicates chronic HF is unlikely<br>NT-proBNP between 400 and 2000 pg/ml is equivocal<br>NT-proBNP > 2000 pg /ml indicates chronic HF is likely.<br>Age related Reference Intervals,<br>95 th percentile age related upper limits in subjects without known cardiac risks ,. symptoms or history are:<br>18-44 years : 97 pg /ml<br>45-54 years : 121 pg/ml<br>55-64 years 198 pg /ml<br>65-74 years : 285 pg /ml<br>≥ 75 years : 526 pg /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 |
|---|---|---|---|---|---|---|
| | | | | | | 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.<br>Be aware that:<br>* 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.<br>* 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/1.73m2], sepsis, chronic obstructive pulmonary disease, diabetes, or cirrhosis (of the liver). Please contact the Duty Scientist on Ext 3127 for further details.<br>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 5mls | 4 Weeks | Female:<br>11.0 – 43.0 ug/L<br>Male:<br>14.0 – 42.0 ug/L | Clinical Chemistry | Fasting specimen required. Part of Bone Biomarker. Protocol available from Lab.<br><br>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. |

| Analyte / Investigation | Specimen Type | Container Type / Volume | Turn Around Time | Reference Interval (or clinical decision value) | Laboratory | Comments<br>Further Information is available from the laboratory or online at http://labtestsonline.org |
|---|---|---|---|---|---|---|
| Oestradiol | Blood | Serum Gold Cap 5mls | Daily Mon-Fri | Male:<br>50-159 pmol/L,<br>Female:<br>Follicular 114-332 pmol/L,<br>Mid Cycle 222-1959 pmol/L,<br>Luteal 222-854 pmol/L,<br>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.<br><br>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<br>CSF IgG 10-35 mg/L<br>IgG Index 0-0.7<br>Serum Albumin 35-52 g/L<br>Serum IgG 7-16 g/L<br><br>CSF IgG Pattern: Normal | Immunology | Specimens referred to Eurofins Biomnis.<br>CSF must be accompanied by serum sample taken at the same time.<br>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<br>Further Information is available from the laboratory or online at http://labtestsonline.org |
|---|---|---|---|---|---|---|
| | | | | isoelectric focusing pattern. | | |
| 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.<br><br>Values of <110pg/ml are mainly seen in patients with narcolepsy with cataplexy.<br><br>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).<br><br>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 5mls | 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 - 24hr collection | 24 hour urine bottle - no additive | 20 days | 4.0 - 31.0 mg/24 hr | 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. |

| Analyte / Investigation | Specimen Type | Container Type / Volume | Turn Around Time | Reference Interval (or clinical decision value) | Laboratory | Comments<br>Further Information is available from the laboratory or online at http://labtestsonline.org |
|---|---|---|---|---|---|---|
| P1NP<br>(Total Procollagen Type 1 N-Propeptide) | Blood | Serum Gold Cap 5mls | 4 Weeks | Female:<br>17.3 - 83.4 ug/L<br>Male:<br>22.1 – 85.7 ug/L | Clinical Chemistry | Part of Bone Biomarker Profile. Sample Collection protocol available from laboratory.<br><br>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.<br><br>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<br><br>Reference intervals for males taken from Roche internal data |
| Paracetamol | Blood | Serum Gold Cap 5mls | 1 hour | 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 | Sterile Universal container | 7 days in season<br>9 days out of | 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 |
|---|---|---|---|---|---|---|
| | secretions | | season | | | |
| Parathyroid Hormone (PTH) | Blood | Serum Gold Cap 5mls | 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.<br>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.<br><br>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) |
| 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. |
| PDL-1 (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)<br>Urothelial: ≥10<br>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. |

| 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 |
|---|---|---|---|---|---|---|
| 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 mins | 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.<br><br>Ideally analyse within 1 hr of collection. Non-viscous pleural fluids can have pH determined from ward based blood gas analysers using 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 5mls | 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 5mls | 4 hrs | Adults 0.8 - 1.5 mmol/L | Clinical Chemistry | Levels in children (2-12 years) are higher. |
| Urine Phosphate Excretion | Urine - 24hr collection | Spot Urine 24hr urine bottle (plastic) - no preservatives required | Daily (Mon-Fri) | Early morning Urine Sample 13-44 mmol/l Or 13-42 mmol/24hrs | 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.<br><br>Urine creatinine is added to all urine phosphate requests automatically by IT rule. Urinary volumes are reported in Litres. |

| 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 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). |
| 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) | Fresh Broncho Alveolar Lavage | Large Sterile Container/ | Results faxed next working | N/A | Microbiology Dispatch | Referred to Micropathology Ltd., Warwick Lab must be informed in advance if test required urgently- Sputum |

| 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 |
|---|---|---|---|---|---|---|
| PCP | (BAL) | amount available | day | | | 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 - 24hr collection (Spot urine if emergency request) | 24hr urine bottle (plastic) - no preservatives required - Protect from light at all times | 15 days | <16 µmol/24hrs …. Random Urine: <1.5 µmol/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 |
| Porphyrins (urine) | Urine - 24hr collection | 24hr 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 5mls | 4 hrs | 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 |

| 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 |
|---|---|---|---|---|---|---|
| | | | | | | Potassium Infusion. If there is >8 hrs between collection and sample receipt / separation the sample will be deemed unsuitable for potassium measurement.<br>If the K >6 mmol/L and the H index is low (for K ≤54 µmol/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).<br>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 - 24hr collection | 24hr urine bottle (plastic) - no preservatives required | Mon - Fri Same day if received before 11am | 20 - 125 mmol/24hrs | 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.<br>Urine creatinine is added to all urine potassium requests automatically by IT rule.<br>Urinary 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<br>Plasma Renin Activity | Blood | 2 x 3 ml EDTA Lavender Cap tubes on ice | 20 days | Upright: 0.5 - 5.3 ng/ml/h | Clinical Chemistry | Referred to Eurofins Biomnis<br>Send samples on ice to laboratory immediately. Indicate posture.<br>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 5mls | 24 hrs/day | <0.06: No systemic inflammatory reaction<br>0.06 - <0.5: Measurable | 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 prognostic marker to support outcome prediction |

| 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 |
|---|---|---|---|---|---|---|
| | | | | but low systemic inflammatory reaction<br>0.5 - < 2.0: Significant but moderate systemic inflammatory reaction<br>2.0 - <10.0: Severe systemic inflammatory reaction<br>10 - >100: Indicates an important systemic inflammatory response | | 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.<br><br>It is not advised to recheck PCT concentrations until at least 6 hours have passed since the previous sampling.<br><br>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 5mls | Daily Mon-Fri | Mid Luteal<br>> 20nmol/l | Clinical Chemistry | State LMP.<br>Biotin may cause some concentration dependent positive interference in this assay if high dose supplements are taken. If this is suspected, a repeat<br>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 5mls | Daily Mon-Fri | Female: 102 - 496 mUl/L,<br>Male: 86 - 324 mU/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<br>request 8 plus hours off Biotin is recommended in the first instance. Please contact the Duty Scientist on Ext 3127 for further details |

| 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 |
|---|---|---|---|---|---|---|
| | | | | | | Causes of an elevated prolactin include:<br>1. Physiological (stress, pregnancy, breastfeeding);<br>2. Medication (dopamine antagonists, reserpine, oestrogen);<br>3. Chronic renal impairment, Hypothyroidism;<br>4. Macroprolactin;<br>5. A prolactin secreting pituitary adenoma.<br>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.<br>https://www.hse.ie/eng/about/who/cspd/ncps/pathology/resources/lab-testing-for-hyperprolactinaemia.pdf |
| Prolactin minus Macroprolactin | Blood | Serum Gold Cap 5mls | 10 days | Female: 75 - 381 mUl/L,<br>Male: 63 - 245 mU/L. | Clinical Chemistry | |
| Total Protein | Blood | Serum Gold Cap 5mls | 4 hrs | 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<br>6 hours - urgent | 74 - 132 IU/dl | Haematology | Tests done in batches as part of the Thrombophilia screen every 4 - 6 weeks, unless requested urgently.<br>Sample stability = 4 hrs post collection. |
| Protein S (Free) | Blood | Sodium Citrate Light Blue Cap 3 mls | | Female (65 – 133) U/dl<br>Male (76 – 146) U/dl | Haematology | Tests done in batches as part of the Thrombophilia screen every 4 - 6 weeks, unless requested urgently.<br>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 | Urine - fresh spot | Sterile universal container – 20 mL | 2 weeks | Qualitative Reporting | Immunology | Specimens with significant blood content are unsuitable for analysis. |

| 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 |
|---|---|---|---|---|---|---|
| Bence Jones Protein or BJP | | | | | | 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. |
| 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.<br>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 - 24hr collection | 24hr urine bottle (plastic) - no preservatives required | Mon - Fri Same day if received before 11am | <0.15 g/24hr | 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.<br><br>Urine creatinine is added to all urine protein requests automatically by IT rule.<br>Urinary volumes are reported in Litres.<br><br>Please note : Haemoglobin and/or Homogentisic Acid in the Urine will cause a positive Interference.<br><br>'Haemolysed samples are unsuitable for serum protein electrophoresis. In cases where in vivo haemolysis is suspected, please contact the laboratory'. |
| Prothrombin Mutation or PT 3' UTR | Blood | EDTA<br>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<br>Light Blue Cap 3 mls | Urgent 1.5hr<br>Routine 4hrs<br>GP – 2 working days | See report | Haematology* | One sample sufficient for PT, INR, APTT, APTT Ratio, D-Dimers, Fibrinogen.<br>Sample stability = 24 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 |
|---|---|---|---|---|---|---|
| PSA (Free) (FPSA) | Blood | Serum Gold Cap 1mls 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 5mls | Daily (Mon-Fri) | Age Related:<br><br><50 yr <2 ug/L<br>50-59 yr <3 ug/L<br>60-69 yr <4 ug/L<br>≥70 yr <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.<br>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.<br>Biotin may cause some concentration dependent negative interference in this assay if high dose supplements are taken. If this is suspected, a repeat<br>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 |
| 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 | 18 days | See Report | Microbiology Dispatch | Hand Deliver to Microbiology Lab at room temperature as soon as possible post venepuncture<br>Samples are referred to the TB Laboratory in the Mater Hospital.<br>Samples must be received before 14:30.<br>Tubes are incubated in SVUH for 16-24 hours and centrifuged prior to transporting to the Mater.<br>Please do not send on Friday where possible.<br>Phlebotomy will NOT take bloods for Quantiferon testing 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 |
|---|---|---|---|---|---|---|
| | | Samples must not be refrigerated. Date and time of sampling must be recorded. | | | | 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 6mls | 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. |
| Renal Profile (Urea/Electrolytes). Includes urea, creatinine, sodium, potassium, chloride. | Blood | Serum Gold Cap 5mls | 4 hrs | 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 | | | | | | |

| Analyte / Investigation | Specimen Type | Container Type / Volume | Turn Around Time | Reference Interval (or clinical decision value) | Laboratory | Comments<br>Further Information is available from the laboratory or online at http://labtestsonline.org |
|---|---|---|---|---|---|---|
| Retinol Binding Protein RBP | Blood | Serum | 2 days | See report | Clinical Chemistry Dispatch | Serum refrigerated<br>Usually measured in conjunction with Vitamin A |
| Respiratory Virus Screen (PCR)<br><br>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)<br>Sterile Universal container for aspirate or BAL | 7 days in season<br>9 days out of season<br>Positive results are phoned to Microbiology team | N/A | Microbiology Dispatch | Referred to National Virus Reference Laboratory University College Dublin out of season.<br>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<br>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.<br>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) |
| 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. |

| 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 |
|---|---|---|---|---|---|---|
| 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<br><br>Saliva | Serum/ 5-10ml<br><br>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 | <0.35 IU/mL Negative<br>3.5-5 IU/mL Equivocal<br>>5.0 IU/mL Positive | Immunology | RF is positive in 80% of patients with rheumatoid arthritis.<br>Negative RF makes a diagnosis of RA unlikely, however does not completely exclude diagnosis.<br>High levels of RF are frequently associated with rheumatoid arthritis.<br>Levels of rheumatoid factor may increase with age, infection, malignancy, therapy with certain drugs, and in a range of inflammatory disorders.<br><br>Minimum retesting interval:<br>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 5mls | 1hours | 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 µmol/L may cause significant negative interference in the salicylate assay. |

| 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 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 | 2 weeks | See Report | Clinical Chemistry Dispatch | Specimens referred to Eurofins Biomnis. |
| Sex Hormone Binding Globulin (SHBG) | Blood | Serum Gold Cap 5mls | Daily Mon-Fri | Reference intervals are not provided in those <20 years old.<br><br>Male<br>20-49 yrs: 16.5-55.9 nmol/L<br>≥50 yrs: 19.3-76.4 nmol/L<br><br>Female<br>20-49 yrs: 24.6-122 nmol/L<br>≥50 yrs: 17.3-125 nmol/L | Clinical Chemistry | State if patient is on oestrogen or pregnant.<br><br>In specimens from female samples, the free testosterone index is added automatically by IT rule to testosterone and SHBG requests.<br><br>The ≥50 years reference interval has not been verified for use in those >70 years<br><br>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. |

| Analyte / Investigation | Specimen Type | Container Type / Volume | Turn Around Time | Reference Interval (or clinical decision value) | Laboratory | Comments<br>Further Information is available from the laboratory or online at http://labtestsonline.org |
|---|---|---|---|---|---|---|
| | | | | | | |
| Sirolimus (Rapamune) | Blood | EDTA Lavender Cap 3mls | 20 days | Each patient should be individually monitored | Immunology | Specimens Referred to Harefield Hospital (UK). |
| 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.<br>GP DIF samples use saline-moistened gauze. Deliver directly to laboratory staff and notify person receiving it is for DIF<br>Requirements:<br>Two biopsies in separate specimen pots:<br>(1) Lesional in 10% formalin<br>(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 5mls | 4 hrs | 133 - 146 mmol/L | Clinical Chemistry | NB: Do not take blood from a limb with an IV Infusion. |
| Sodium (Direct) | Blood | Serum Gold Cap 5mls | 4 hrs | 133 – 146 mmol/L | Clinical Chemistry | NB: Do not take blood from a limb with an IV Infusion. |
| Urine Sodium Excretion | Urine - 24hr collection | 24hr urine bottle (plastic) - no preservatives required | Daily Mon - Fri | 40 - 220 mmol/24hr | Clinical Chemistry | Urine creatinine is added to all urine sodium requests automatically by IT rule.<br>Urinary volumes are reported in Litres. |
| Urine Sodium | Urine - Fresh spot | Sterile Universal Container - 5ml (min) | 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:<br><br>AFB/ZN | 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 |
|---|---|---|---|---|---|---|
| Alcian Blue<br>Alcian Blue/PAS<br>Congo Red<br>GRAM<br>Masson Trichrome<br>Grocott's Methenamine Silver<br>Jones Methenamine Silver<br>Maritus Scarlet Blue<br>Millers Elastin Stain<br>Oil Red O<br>PAS<br>PASD<br>Perls Prussian Blue<br>Retic<br>Rubeanic Acid<br>Shikata Orcein<br>Haematoxylin Shikata<br>Van Gieson | | | | | | |
| 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<br><br>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:<br>minimum protective level - 0.01 IU/ml<br>optimum protective level - >0.1 IU/ml | Immunology | Referred to Immunology, St. James's Hospital, Dublin 8<br><br>Investigating immunodeficiencies due to thymic abnormalities. |

| 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 |
|---|---|---|---|---|---|---|
| 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:<br>Minimum protective level is 0.15 mg/L<br>Optimum protective level is >1.0 mg/L | Immunology | Referred to Immunology, St. James's Hospital, Dublin 8<br><br>Investigating immunodeficiencies due to an inability to raise a specific antibody response. |
| Sputum<br>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. |
| 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. |

| 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 |
|---|---|---|---|---|---|---|
| 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.<br><br>Specimens must be received in the laboratory by 10.30am in order to be analysed on the day of receipt.<br><br>Samples should be stored at 4$^{o}$C (fridge) overnight. |
| TB Specimens<br>AFB Stain & TB Culture<br><br>Molecular Detection* | Various<br><br>Respiratory specimens | Depending on the sample usually Sterile Universal Container | AFB Stain: 24-48hrs<br>TB negative culture: 6 – 12 wks<br>Positive culture – up to 50 days<br><br>Next working day | N/A | Microbiology | All positive results are phoned to the team/ clinician when confirmed.<br><br>* Molecular Detection – testing performed on approval by Consultant Microbiology only. |
| 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 5mls | Daily Mon-Fri | Reference intervals are not provided in those <16 years old.<br><br>Male<br>16-19yrs: 6.2-30.6 nmol/L<br>20-49yrs: 8.6-29.0 | Clinical Chemistry | Indicate gender and age.<br><br>In specimens from female samples, the free testosterone index is added automatically by IT rule to testosterone and SHBG requests.<br><br>The ≥50 years reference interval has not been verified for use in those >70 years |

| 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 |
|---|---|---|---|---|---|---|
| | | | | nmol/L<br>≥50 yrs: 6.7-25.7 nmol/L<br><br>Female<br>16-19yrs: 0.1-1.3 nmol/L<br>20-49yrs: 0.3-1.7 nmol/L<br>≥50 yrs: 0.1-1.4 nmol/L | | 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.<br><br>Before the use of testosterone preparations in females, serum testosterone levels should be assessed to exclude high baseline levels and to prevent subsequent supraphysiological 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<br>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 5mls | Daily | Therapeutic Range: 10 - 20 mg/L See comments. | 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 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).<br>Samples must be analysed within 24 hours of collection. |
| Thioguanine Nucleotide | Blood | EDTA Lavender Cap 3mls x 2 | 20 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<br>Sample stability = 4hrs post collection |

| Analyte / Investigation | Specimen Type | Container Type / Volume | Turn Around Time | Reference Interval (or clinical decision value) | Laboratory | Comments<br>Further Information is available from the laboratory or online at http://labtestsonline.org |
|---|---|---|---|---|---|---|
| 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<br>Serum gold cap x 1 to Immunology Lab for ACA testing. | 4-6 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 **mus**t be filled out for any genetic studies e.g. Prothrombin gene mutation or Factor V Leiden. See guidelines for Thrombophilia Testing.<br>Sample stability = 4hrs post collection. |
| Thyroglobulin<br><br>Anti-Thyroglobulin | Blood | Serum Gold Cap 5mls | Daily Mon-Fri | 3.5 - 77 ng/ml<br><br><br><115 IU/ml | Clinical Chemistry | A reliable Tg(t(1/2)) estimation could be obtained by a simplified formula requiring only 2 postsurgery Tg measurements (24 and 120 hours, respectively).<br>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<br><br>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.<br>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 |
| 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. |

| 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 |
|---|---|---|---|---|---|---|
| Tobramycin | Blood | Serum Gold Cap 5mls | 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 0.33 – 0.9 mg/L.<br>Samples must be analysed within 24 hours of collection.<br><br>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.<br>Trough level <1 mg/L Maintain dosing regimen.<br>Trough level ≥1 but ≤1.4 Reduce once daily dose by 1-2 mg/kg and repeat level 16-24 hours post-dose.<br>Trough level >1.4 mg/L Hold dose and repeat level next day. Do not re-dose until level <1 mg/L. |
| Total T3 | Blood | Serum Gold Cap 5mls | Daily (Mon-Fri) | 1.3 – 3.1 nmol/L | Clinical Chemistry | 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<br>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<br>CSF<br>Tissue | Serum/ 5-10ml<br>Sterile Universal container | Only by specific arrangement | N/A | Microbiology Dispatch | Referred to Toxoplasma Reference Unit, Public Health Wales, Swansea |

| 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 |
|---|---|---|---|---|---|---|
| TPMT Thiopurine Methyltransferase | Blood | 5Mls Heparin whole blood unspun or EDTA | 8 weeks - Batched analysis; dispatched weekly | Normal: 26 - 50 pmol/h/mgHb Carrier: 10 - 25 pmol/h/mgHb Deficiency: <10 pmol/h/mgHb | Clinical Chemistry Dispatch | Referred to Outside Laboratory (Eurofins Biomnis). |
| Transferrin | Blood | Serum Gold Cap 5mls | 4 hrs | 2.00 - 3.60 g/L | Clinical Chemistry | Part of Iron Studies |
| Transferrin Saturation (% Tranferrin Satn.) | | | | | Clinical Chemistry | Part of Iron Studies<br>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<br>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<br><br>(Please also see Lipid Profile) | Blood | Serum Gold Cap 5mls | 4 hrs | N/A | Clinical Chemistry | If triglycerides >10 mmol/L and no previous or previous <10 mmol/L, phosphate, GGT, creatinine and TSH are added automatically by IT rule.<br>For lipid interpretation please see ESC/EAS guidelines for the management of dyslipidaemias. European Heart Journal (2019) doi.org/10.093/eurheartj/ehz455<br>"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. |

| 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 |
|---|---|---|---|---|---|---|
| | | | | | | 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."<br>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)<br><br>Blood | Sterile Universal container<br>Serum Gold Cap 5mls<br>EDTA Lavender Cap 3mls | 7 days | N/A | Microbiology Dispatch | Referred to Eurofins Biomnis |
| Trypanosoma Abs | Blood | Serum Gold Cap 5mls | 9 days | See Report | Microbiology Dispatch | Referred to Hospital for Tropical Diseases London. |
| Troponin T (hs)<br><br>(Troponin T High Sensitivity) | Blood | Serum Gold Cap 5mls | 1 hr | 5 - 14 ng/L<br>(99th centile of values in a healthy population) | Clinical Chemistry | The universal definition of myocardial infarction requires a rise and/or fall of cardiac troponin in patients with symptoms of cardiac ischaemia or ECG changes, with at least one value above the 99th percentile (upper limit of normal). Therefore it is recommended that two troponin specimens are taken for measurement, the first at presentation and the second at a minimum of 6 hours later.<br>In a clinically ischaemic patient consider AMI if:<br>a) Troponin T (hs) changes by 100% in two specimens at least 6 hrs apart AND if b) at least one result is >14ng/L<br>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 99$^{th}$ percentile is 14ng/L.<br><br>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 |

| 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 |
|---|---|---|---|---|---|---|
| | | | | | | provide an approximate result to the requestor. Results should be confirmed in a non-haemolysed serum sample as soon as possible.<br><br>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.<br><br>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 hours after complete resolution of symptoms, to support diagnosing anaphylaxis retrospectively.<br><br>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.<br><br>EAACI guidelines: Anaphylaxis (2021 update). (2022 ) Allergy77:357-377 |
| TSH | Blood | Serum Gold Cap 5mls | Daily (Mon-Fri) | 0.27 - 4.20 mIU/L | Clinical Chemistry | TSH is performed as a front line thyroid function test.<br>Current TFT reflex rules are as follows:<br>- If TSH >4.2 add fT4<br>- If TSH <0.27 add fT4 and fT3<br>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 | |

| 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 |
|---|---|---|---|---|---|---|
| Urate (Uric Acid) | Blood | Serum Gold Cap 5mls (Pre-chilled plasma Lithium Heparin Green Cap tube for patients on Rasburicase, transported on ice) | 4 hrs | 200 - 420 µmol/L Male 140 - 360 µmol/L Female | Clinical Chemistry | If the uric acid result is <100 µmol/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.<br><br>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 24hr urine bottle (plastic) - no preservatives required | Mon- Fri Same day if received before 11am. | Early morning Urine Sample 2200-5475 µmol/l or 1200 - 5900 µmol/24hr | 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. Urinary volumes are reported in Litres. Urine creatinine is added to all urine uric acid requests automatically by IT rule. |
| Urea | Blood | Serum Gold Cap 5mls | 4 hrs | 2.5- 7.8 mmol/L | Clinical Chemistry | Part of Urea and Electrolytes Profile. |
| Urine Urea Excretion | Urine - 24hr collection or spot urine | 24hr 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/24hr ( 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 hr 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 | See final report | Haematology | Samples should be fresh. Sample stability = 12hrs 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 |
|---|---|---|---|---|---|---|
| | | | available from Haematology Team | | | |
| 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 5mls | 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.<br><br>If Valproate >100 mg/L, LFTs added on automatically by IT rule. |
| Vancomycin | Blood | Serum Gold Cap 5mls | 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 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<br>Vesicular fluid<br>Eye swab<br>Throat swab<br>Blood | Sterile Universal container<br><br>Viral swab (liquid viral UTM – red top | 6 days CSF<br><br>9 days other | See Report | Microbiology Dispatch | Referred to National Virus Reference Laboratory University College Dublin<br>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 |

| 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 |
|---|---|---|---|---|---|---|
| | | container)<br><br>Serum/ 5-10ml | | | | |
| Venous Blood Gases | Venous Blood | Pre-heparinised blood gas syringe - 2ml | 15 mins | pH = 7.32 - 7.43,<br>Direct ISES :<br>NA 133-146 mmol/l<br>K 3.5-5.3 mmol/l<br>CL 95-108 mmol/l<br>HCO3- 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. |
| Viral culture / viral studies | Various specimen types | Sterile Universal container<br>Viral swab (liquid viral UTM – red top container)<br>Always state clinical details and specimen site | 11-25 days | N/A | Microbiology Dispatch | Referred to National Virus Reference Laboratory University College Dublin<br>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 | Serum Non Gel (red cap)- 6ml - Protect from light - Frozen within an hour. | 1-2 weeks | See Report | Clinical Chemistry Dispatch | Referred to Outside Laboratory (Eurofins Biomnis). To be frozen. Batched weekly for dispatch.<br>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 returned vitamin A concentration. |
| Vitamin B1 (Thiamine) | Blood | 2ml EDTA whole blood frozen within 4 hours & protected from light | | | Clinical Chemistry Dispatch | Referred to Eurofins Biomnis |
| Vitamin B12 | Blood | Serum Gold Cap 5mls | 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.<br>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 |

| Analyte / Investigation | Specimen Type | Container Type / Volume | Turn Around Time | Reference Interval (or clinical decision value) | Laboratory | Comments<br>Further Information is available from the laboratory or online at http://labtestsonline.org |
|---|---|---|---|---|---|---|
| | | | | | | recommended in the first instance. Please contact the Duty Scientist on Ext 3127 for further details.<br>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<br>Add on requests are not accepted due to stability issues. |
| Vitamin B6 (Pyridoxine) | Blood | EDTA whole blood frozen within 4 hours - Protect from light | 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. | 6 days | See Report | Clinical Chemistry Dispatch | **Bring specimen to laboratory immediately as specimen must be frozen within one hour. 3mls of frozen plasma is required for test. Specimen must be stored away from the light. Specimen referred to Eurofins Biomnis.<br>"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)$_2$D) Calcitriol | Blood | Serum Gold Cap 5mls | 40 days (Batched) | 43 – 168 pmol/L | Clinical Chemistry Dispatch | Referred to Norwich Hospital<br>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 hrs). |
| 25(OH)Vitamin D | Blood | Serum Gold Cap 5mls | Daily | 30-125 nmol/L | Clinical Chemistry | |
| Vitamin E | Blood | Non-gel serum (red cap) frozen < 1 hour - Protect from light | 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.<br>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 vit E / |

| 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 + trigs will be unaffected and may prove useful for interpretation in the setting of an acute phase response. |
| Vitamin K | Serum | **Red/Gold Cap 2mls Protect from light. | 4 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<br><br>NA-please see note opposite | Urine - 24hr collection | 24hr urine collection in an acidified 24 hrs urine container | 1 week | 0.8-2.0 ummol/mmol Also reported in (µmol/24hr) | 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 |

| 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 |
|---|---|---|---|---|---|---|
| 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 | | | | | | |
| 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, OR 2ml serum or heparin | 2 weeks | See Report | Clinical Chemistry Dispatch | Specimen 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 |
|---|---|---|---|---|---|---|
| | | plasma. | | | | |