Roscommon University Hospital

Pathology Laboratory User Manual

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Contents

1. INTRODUCTION

The Pathology service in Roscommon University Hospital (RUH) is part of the Laboratory Directorate of the Saolta Health Care Group. It is organised into a Blood Sciences Department (combined Haematology and Biochemistry) and Blood Transfusion. This manual is designed to provide a guide to services provided by the Pathology Laboratory of Roscommon University Hospital.

1.1. Services available at RUH Pathology Laboratory:

The pathology department provides a routine and emergency diagnostic service in Blood Sciences and Transfusion to all clinical areas at Roscommon University Hospital. It also provides a diagnostic services to other healthcare institutions and to the community of General Practitioners (GPs) supported by the hospital. A Haemovigilence Service is available in the hospital; see Table 1 for contact details.

1.2. Services unavailable at RUH Pathology Laboratory:

All samples for Immunology, Histology and Microbiology are referred to the Laboratory Medicine Department at Galway University Hospital (GUH). All results are available on the Laboratory Information system but access to some results especially Histology will be restricted to certain users. In the event that a specific Immunology, Histology or Microbiology test is not available in GUH then the sample may be referred to an outside laboratory for testing.

All Biochemistry and Haematology tests not available in the Pathology Laboratory at Roscommon Hospital are referred to Laboratory Medicine Department at Galway University Hospital. All results are available on the Laboratory Information system. In the event that a specific Biochemistry or Haematology test is not available in GUH then the sample may be referred by either GUH or RUH to an outside laboratory for testing.
For these samples the laboratory operates a tracking system for all tests referred out. When samples are referred out they are booked into the LIS with details of the test name and referral centre. When reports are returned from the referral laboratory, RUH dispatches the original report to the requestor.

Specimen / Request form requirements for all tests referred to GUH can be obtained in the current version of the Laboratory Medicine User Guide University Hospital Galway, which is available for viewing on www.saolta.ie under the publications section or enter under search function. A full list of tests available, laboratory opening hours and contact details for all consultants are available in this publication.
All samples for referral to GUH are sent by courier at 13:00 each day Monday to Friday and should be received in the Laboratory no later than 12:50 to be included in the routine dispatch. If there is a need to send samples urgently to GUH please contact the Laboratory to arrange delivery. For Blood Cultures taken between 12 midnight and 09:00 am please use the transport boxes provided on the Wards. Full instructions and contact details are included on the box.

1.3. Accreditation:

The Blood Transfusion laboratory and Haemovigilance Service are accredited by the Irish National Accreditation Board (INAB) in compliance with the International Standard ISO/IEC 15189 (Registration number 238MT) and are committed to performing all activities in accordance with the requirements of the International Standard, ISO 15189 (Medical Laboratories – Particular Requirements for Quality and Competence) and of the EU Directive 2002/98/EC.

Laboratory management are committed to:-

- Staff recruitment, training, development and retention at all levels to provide a full and effective service to its users.
- The proper procurement and maintenance of such equipment and other resources as are needed for the provision of the service.
- The collection, transport and handling of all specimens in such a way as to ensure the correct performance of laboratory examinations.
- The use of accredited examination procedures and methods that will ensure the highest achievable quality of all tests performed.
- Reporting results of examinations in ways which are timely, confidential, accurate and clinically useful.
- The assessment of user satisfaction, in addition to internal audit and external quality assessment, in order to produce continual quality improvement.

Details of the scope of accreditation can be seen at http://www.inab.ie/Directory-of-Accredited-Bodies/Laboratory-Accreditation/Medical-Testing/Saolta-University-Health-Care-Group-Roscommon-Hospital.html

All Blood Science laboratory activities are subject to continuous review through quality assurance and audit.
The laboratory participates in a number of external quality assessment schemes, all of which are accredited. A list of assays and relevant schemes is available on request.

1.4. Confidentiality:

All Laboratory staff are bound by the Health Service Executive Codes of Standards and Behaviour which states: "Employees must not improperly disclose, during or following termination of employment, information gained in the course of their work.
Employees may have access to or hear information concerning the medical or personal affairs of patients and/or employees, or other health service business. Such records and information are strictly confidential and can only be divulged or discussed in the performance of normal duty. Disclosure of records or information under various statutory provisions (e.g. Freedom of Information Acts 1997 and 2003; Data Protection Acts 2001 and 2003; the Health Acts 1947 to 2007) will be made in accordance with HSE policies, procedures and protocols."

GDPR provides for significant reforms to current data protection rules. It provides for higher standards of data protection for individuals and imposes increased obligations on organisations that process personal data. All HSE staff must comply with all applicable data protection, privacy and security laws and regulations including the HSE Data Protection Policy which sets out the requirements of the HSE relating to the protection of personal data where we act as a Data Controller and / or Data Processor, and the measures to be taken to protect the rights of data subjects, in line with EU and Irish legislation.
HSE Data Protection Policy is available from: https://www.hse.ie/eng/gdpr/hse-data-protection-policy/hse-data-protection-policy.pdf.

2. CONTACT DETAILS

Section	Telephone
Laboratory Office (all enquiries)	09066 32258 or 09066 32176
Roscommon University Hospital – Switchboard	09066 32000
Emergency out of hours on call laboratory service	9 (switchboard) –and request to be connected to mobile of scientist on-call.
Chief Medical Scientist	09066 32131
Blood Transfusion	09066 32023
Quality Manager	09066 32249
Haemovigilance Office	09066 32350 or bleep 148
Consultant Haematologist (GUH Blood Transfusion)	091 524222 and request to speak to the Haematology consultant on call.

Other Galway University Hospital Laboratory Medicine Consultants	See GUH LAB Users Guide available for viewing on www.saolta.ie under the publications section or enter under search function.
Postal Address	Pathology Laboratory, Roscommon University Hospital, Athlone Road, Roscommon F42 AX61.
email	denise.lally@hse.ie
Complaints:	denise.lally@hse.ie or marie.ralphs@hse.ie
GP Supplies:	RUH.pathuser@hse.ie
Haemovigilance Officer	mary.mimnagh@hse.ie

Table 1. Contact details. If calling from within Roscommon Hospital just dial the digits shown in blue.

3. LOCATION

The Laboratory is located on the first floor of the hospital. The external door is controlled via keypad access. Please ring bell for access.

4. OPENING HOURS

Department/Activity	Opening Hours
Routine Laboratory Diagnostic Service Mon. to Fri.	**09:00 to 20:00**
Routine Laboratory Diagnostic Service Sat. a.m.	**09:30 to 12:00**
On call Mon. to Fri. (Contact Med. Scientist on call via switchboard before sending samples)	**20:00 to 09:00 (next morning)**
On call Sat. (Contact Med. Scientist on call via switchboard before sending samples)	**12:00 to 09:30 (Sunday morning)**
On call Sun. & Bank Holidays. (Contact Med. Scientist on call via switchboard before sending samples)	**09:30 to 09:00 (next morning)**

Table 2. Opening Hours

To facilitate efficient processing of requests, samples should be delivered to the laboratory before 19:00. The "On-call" service should not be used to run routine bloods for elective cases.

5. ON-CALL SERVICE

An emergency out of hours service (on call) is in place for emergency work, i.e. non deferrable tests necessary for decisions regarding patient treatment. During these hours, the laboratory is staffed by one medical scientist on call. The scientist must be contacted when urgent samples are being sent to the laboratory (via switch – dial '9' from within RUH).

All tests listed in Section 26 are available on call with the exception of Urinary chemistries.

For advice on any test not included in these lists, please contact the medical scientist on-call.

Blood gases can be analysed on the blood gas instrument located in UCC. Lactate, ionised Calcium, Sodium, Potassium, Chloride, Haemoglobin and Carboxyhemoglobin are also available on this instrument. The Blood Gas analyser is password controlled. Please contact the Pathology Laboratory if you require a password.

6. LABORATORY SUPPLIES

All users must use approved specimen containers, which can be obtained from the Laboratory.

6.1. Hospital

Collect supplies from Laboratory as required during routine opening hours**.** Please do a complete stock check on a monthly basis and send order for any products required rather than submitting multiple orders for one or two items.

6.2. General Practitioners

Requests for supplies should be sent to RUH.pathuser@hse.ie

Please do a complete stock check on a monthly basis and send order for any products required rather than submitting multiple orders for one or two items.

Supplies will be prepared for collection from the laboratory in the second week of each month.

7. SAMPLE AND REQUEST FORM REQUIREMENTS

The Pathology Laboratory has 2 request forms:

- Blood transfusion request form (RCH/BT/F001) is used for blood transfusion requests, including group and screen, group and cross match, direct coomb's test, transfusion reaction investigation, blood component requests. (Board number required on all request forms if available) For Blood Transfusion samples refer to **Positive identification** of the patient prior to sample collection is detailed in Haemovigilance procedure RCH/HVIG/CP/003.

  Patient Consent for transfusion must be documented on Transfusion Prescription and Administration Document for Blood and Blood Components RCH/HVIG/CF009 following discussion between doctor and patient who provide the patient with the information detailed in policy for Provision of Information to Patients Regarding the Administration of Blood Component or Product RCH/HVIG/CP/001.

- Blood Sciences request form (RCH/BS/F001) used for all non Transfusion requests. This is a triplicate request form and if using pre printed patient ID labels ensure a copy of the label is placed on all 3 copies. Note for RUH patients the ward and consultant are not specified on pre printed labels and must be handwritten on form. (Board number required on all request forms if available)

Table 3: Specimen / Request Form Acceptance/Rejection Criteria

Information Required on Specimen	Information Required on Request Form	Requirements	Action if non-compliant
Surname & Forename	Surname & Forename	Details on specimen must match details on request form. All specimens from within RUH should be labelled with Blood Tack label generated at the bedside except OPD or theatre specimens which may be handwritten or in exceptional circumstances when all Blood Track PDA / printers are out of service or in emergency situation. In the case of samples not originating within RUH it is the responsibility of the requesting Doctors/Phlebotomists who opt to use printed labels to have safe procedures in place for controlling and printing, affixing and checking patient details of such labels. NEVER use felt tip pens to label samples or complete request forms.	Request will be rejected. (If Blood Track label / patient ID label is offline or any of the required information is missing then request will be rejected.) Note: In Transfusion the urgent need for blood overrides the strict sample labelling requirements. If the situation is critical, blood samples shall be identified with sufficient information to identify the patient, two independent identifiers (e.g. patient full name and board number) and the individual who drew the blood. Specimen may be processed. A comment will be included in the printed test report detailing the nature of the non-conformance.
DOB	DOB		
Unique ID (Board No.)	**Unique ID (Board No.)** GP users are requested to provide the **'Hospital Board Number' (BN)** applicable to the patient on the request form if available.		
Date and time of specimen collection	Date and time of specimen collection		
Gender	Gender		
	Sample type		
Blood Track COLLECT label (if applicable)	Blood Track COLLECT label (if applicable)		
	Patient Address	Must be on Blood Transfusion request form if sample not originating within RUH. (e.g.from G.P.)	
Signature of specimen taker	Signature of specimen taker	Blood Track COLLECT label is acceptable as signature of the taker on specimens and request forms from within RUH	
Ward/Location (*RUH in-patients and OPD patients only*)	Ward/Location	Must be on specimen or form. Details on specimen should match details on request form.	If absent from request form sender will be asked to confirm before sample can be processed Sample is processed. A comment will be included in the test report detailing the nature of the non-conformance. **Contact details of requesting clinician must be supplied to facilitate notification of critical results.**
	Consultant / Requesting G.P.	Must be on request form.	
	Test Request/Product required (in the case of Transfusion request form)	Must be on request form.	If absent from request form sender will be asked to confirm before sample can be processed Sample is processed. A comment will be included in the printed test report detailing the nature of the non-conformance.
	Clinical Details or Special Requirements	All **Blood Transfusion** special requirements e.g. CMV Neg or Irradiated must be specified on form.	If absent from **Transfusion request form** sender will be asked to confirm before sample can be processed Sample is processed. A comment will be included in the printed test report detailing the nature of the non-conformance.
	Signature of requestor + Bleep or Ext. No. or contact phone number	For **Transfusion request forms** all fields must be complete on bottom left section of request form and must be traceable via user ID from the Blood Track label.	Requesting Doctor or nominee may amend the Request form. **Contact details of requesting clinician must be supplied to facilitate notification of critical results.**

Table 4: Transfusion specific requirements

Information Required on Request Form	Requirements	Action if non-compliant
Type of Blood Component	Must be on **Blood Transfusion** request form	If absent from **Transfusion request form** sender will be asked to confirm before sample can be processed Sample is processed. A comment will be included in the printed test report detailing the nature of the non-conformance.
Quantity of Blood Component required.		
Date required		
Time required		
Previous Transfusion history		
Clinical Details or Special Requirements	All **Blood Transfusion** special requirements e.g. CMV Neg or Irradiated must be specified on form.	
Signature of requestor + Bleep or Ext. No. or contact phone number	For **Transfusion request forms** all fields must be complete on bottom left section of request form and must be traceable via user ID from the Blood Track label.	Requesting Doctor or nominee may amend the Request form.

Table 5: Additional Specimen Rejection Criteria

Issue	Action
Current patient details relating to patients name, date of birth, hospital number or board number do not match with historical details on file.	Requestor will be contacted and if current details are correct request will be accepted. If incorrect it will be rejected.
Incorrect sample container, under filled, grossly haemolysed, sample leaked, or no sample	Request will be rejected. Requestor will be informed.
Specimen containers that are externally contaminated with body fluids	
Details on sample illegible	
Request form contaminated / blood stained	
Use of correction fluid on sample or request form or sample	
Empty sample container	
Expired sample container	
Urgent samples or samples that cannot be repeated.	Due to the nature of histology and CSF samples, incorrectly labelled samples or request forms may be amended. The requesting doctor will be informed and if he/she is confident that the sample can be correctly identified, it may be accepted once the amendments have been made. The doctor must sign the request form to confirm that he/she has amended the sample or form and is satisfied that both sample and form are now correct. Amendments are also permitted on 24 hr Urine Collection samples.

Please remember that inadequately completed request forms can cause delays in issuing reports.
Some requests for biochemistry and haematology are listed on the request form and requested by means of a 'tick box'.
All other investigations required must be clearly handwritten on form.

These criteria for sample acceptance are essential for patient safety. They are in place to decrease the risk of potential harm caused by labelling errors. Samples not meeting the minimum requirements may be rejected. Only addressograph labels generated by the Blood Track handheld system are acceptable on Blood Transfusion samples. If a sample is to be submitted to the Blood Transfusion Laboratory and the Blood Track handheld system is not available the sample label must be handwritten and must contain all the mandatory information detailed in table 3.
Addressograph labels are acceptable on all other samples.
The laboratory reserves the right to reject specimens that are improperly labelled or are accompanied by forms that are incompletely filled. Consistent practices for specimen rejection are employed across the laboratory.

The laboratory recognises that, in certain cases where the specimen, involves an invasive procedure, or could not otherwise be easily recollected, it may be acceptable to apply an exception of specimen rejection. Exceptions are applied using strict and explicit criteria in accordance with established procedures. The person who collected the specimen will be required to come to the laboratory to identify the specimen and record reason for acceptance and sign the request form, assuming responsibility for the identification of the specimen. Reports relating to such samples will carry a disclaimer stating the nature of the non conformance.

If insufficient specimen is received for all tests requested and the specimen is easily re collectable (e.g. urine, stool, sputum, blood), a repeat collection will be requested. Test(s) for which there is sufficient specimen will be performed.

If the specimen is not easily re-collectable (e.g. CSF, fluids), the ordering clinician will be contacted to establish priority order of tests to be performed.

8. ORDER OF DRAW, SAMPLE VOLUMES FOR BLOOD SAMPLES

The order of draw is important to minimize carry-over of anticoagulant. **Note: Blood cultures must be drawn first to avoid contamination.**

Please note, it is preferable that blood tubes, especially those containing preservatives, are filled to their stated capacity. This avoids the risk of insufficiency or interferences from excess concentrations of preservative. This is mandatory for some tests (e.g. coagulation), where an imbalance of preservative due to under-filling or over-filling would invalidate the test. Ensure all blood collection tubes are in date before use.

Table 6: Order of venipuncture.

Specimen Type or Tube Colour and Order of Draw	Additive	Laboratory Use
BLOOD CULTURES	Soya broth	Blood cultures aerobic &anaerobic. Send to Laboratory immediately. For Blood Cultures taken between 12 midnight and 09:00 am please use the transport boxes provided on the Wards. Full instructions and contact details are included on the box.
	Trisodium Citrate	Coagulation Studies & D Dimers. If using butterfly needles and a coagulation sample is the first sample to be taken then a discard sample must be taken before the coagulation sample. Fill to mark on tube.
	Plain (with clot activator)	Serum determinations.
	K2EDTA	Trace Elements
	Lithium Heparin	Contact lab for list of tests
	K2EDTA	Blood Transfusion Group & Hold, X Match, DCT & Transfusion Reaction Investigation.
	K2EDTA	Full Blood count, ESR & DCT. Fill to mark on tube.
	Sodium fluoride/K3EDTA	Blood glucose
	Transfer urine into ***Brown Top*** BD Vacutainer Z	Urine ACR (albumin:creatinine ratio)
Always ensure sample containers are in date.		

9. Transfusion Specific Information:

9.1. Collected specimens should be sent immediately, or as soon as practically possible, to the Blood Transfusion laboratory. Specimens must arrive in the Laboratory within 5 hours of being taken. It is the policy of the Transfusion department to process all specimens received to the blood transfusion laboratory immediately, or as soon as practically possible depending on workload and urgency of sample.

9.2. Blood transfusion specimens are valid for ordering additional testing/ blood components for a period of 72 hours from **the time the sample was drawn**. Cross matched blood is held for a patient for a period of not more than 72 hours. Laboratory will contact ward to inform of crossmatched units that may be de reserved for a given patient before the 72 hours have elapsed, e.g. blood needed for another patient during an emergency bleed.

9.3. Patients that are transfused within the 72 hour time frame of the original specimen need not be re drawn; however a new sample is required after the 72 hours **post time of sample draw** has elapsed.

9.4. **Urgent** specimens for blood transfusion may be sent by the chute system (number 2 for laboratory), alternatively, the specimen may be delivered by designated hospital staff to the medical scientist "on call" and the person generating the request **must contact the scientist on call**.

9.5. Blood Transfusion samples from outside agencies will be processed Mon-Fri 09.00-20.00 and a report will issued on the same day.
Blood transfusion requests from outside agencies must be accompanied by 2 samples see table 2 and table 3 for labelling requirements.

9.6. A Haemovigilance service is available in the hospital. Further information can be got from the Haemovigilance Officer or by contacting the hospital blood bank (see contact details in table 1).

9.7. The following products are stocked in the Blood Transfusion Laboratory:

- Red Cells
- LG Plasma (Octoplas)
- Albumin 20%
- Octaplex
- Platelets are ordered from the IBTS on a named patient basis only and are not stocked at RUH.

9.8. The special coagulation factors shown in Table 7 can be supplied by the Blood and Tissue Establishment (BTE) GUH. Administration of these products must be approved by the patient's consultant after discussion with the Haematologist on call in GUH. Contact the Blood Transfusion Lab. RUH to arrange delivery. As transfusion of these products is likely to be an extremely rare event these products will be administered as specified in relevant policies supplied by BTE GUH.

Table 7. Special coagulation factors available from BTE GUH

Product	Supplier	Apex Product Code	Supplier Code/ Stock Source	Purpose
Activated PCC/FEIBA 1000IU	Baxalta	FEIBA1000	x	Activated PCC product (Human) for treatment of patients with Haemophilia A who have antibodies to Factor VIII
Activated PCC/FEIBA 500IU	Baxalta	FEIBA500	x	
Wilate 500IU	Octapharma	WILA500	o	Von Willebrand factor/Coag. factor VIII complex (Human) for treatment of patient's with Von Willebrand's disease
Wilate 1000IU	Octapharma	WILA1000	o	
Alprolix 250 IU	Sobi	ALP250	S	Alprolix is used for the treatment and prevention of bleeding in all age groups of patients with haemophilia B (inherited bleeding disorder caused by factor IX deficiency)
Alprolix 500 IU	Sobi	ALP500	S	
Alprolix 1000 IU	Sobi	ALP1000	S	
Alprolix 2000 IU	Sobi	ALP2000	S	
Alprolix 3000 IU	Sobi	ALP3000	S	
Novoseven 1mg	Uniphar	NS50	n	Coagulation Factor VIIa recombinant. Treatment of patients with haemophilia A or B who have inhibitors , congenital Factor VII deficiency and patients with Glanzmann's Thrombasthenia who have a decreased or absent response to platelet transfusions.
Novoseven 2mg	Uniphar	NS100	n	
ELOCTA 250IU	Sobi	ELOC250	S	Recombinant coagulation factor VIII, Fc fusion protein. Treatment and prevention of bleeding in all age groups of patients with haemophilia A (factor VIII deficiency). ELOCTA is prepared by recombinant technology without addition of any human- or animal-derived components in the manufacturing process.
ELOCTA 500IU	Sobi	ELOC500	S	
ELOCTA 750IU	Sobi	ELOC750	S	
ELOCTA 1000IU	Sobi	ELOC1000	S	
ELOCTA 1500IU	Sobi	ELOC1500	S	
ELOCTA 2000IU	Sobi	ELOC2000	S	
ELOCTA 3000IU	Sobi	ELOC3000	S	
Fibrinogen	IBTS	RIASTAP	q	RiaSTAP, Fibrinogen Concentrate (Human) indicated for the treatment of acute bleeding episodes in patients with congenital fibrinogen deficiency, including afibrinogenemia and hypofibrinogenemia. RiaSTAP is not indicated for dysfibrinogenemia.
Praxbind	Reversal agent for Pradaxa (Dabigatran) available from Pharmacy RUH. Additional stock available from BTEGUH if required. This is a Pharmacy product and details will not be stored on Apex.			

9.9. All activities relating to transfusion of red blood cells and platelets are monitored using the Blood Track System. Data relating to all blood, platelet and product transfusions are maintained on the Laboratory Information system.

9.10. LIFE THREATENING EMERGENCY BLEED:

9.10.1. The blood transfusion department has 2 units of group confirmed O Rh D negative, phenotype CE and Kell negative red blood cells for emergency transfusion only, when the risk of not transfusing outweighs the risk of waiting for fully crossmatched compatible blood.

9.10.2. Staff should be advised that supply of **group specific uncross matched** blood will take 10 minutes from time of specimen receipt. Supply of **fully crossmatched** blood will take 40 -60 minutes.

9.10.3. Supply of compatible blood is compromised if the patient has **irregular antibodies**, laboratory will advise on availability.

9.10.4. The two units of O negative red blood cells are located in the Roscommon Issue Fridge at the Pathology laboratory specimen reception area. Units are clearly labelled as "Emergency Blood". Use only in extreme emergency. A blood transfusion report form is kept with these units, please complete patient details on this form and keep in patient's chart.

9.10.5. In a life threatening bleed/ multiple trauma, it is imperative that the Medical Officer or deputy, contacts the blood transfusion laboratory, or "on call" scientist as soon as possible to advise of the clinical situation.

9.10.6. A properly labelled transfusion specimen must be drawn, **before transfusing the 2 O Rh negative units**. This is imperative for accurate patient blood grouping.

9.10.7. To prevent the risk of samples being lost in the air chute system, it may be advisable to send a member of staff with the sample, directly to the transfusion laboratory.

9.11. TRANSFUSION REACTION INVESTIGATION

9.11.1. If a transfusion reaction is suspected then:

- Stop the Transfusion immediately
- Notify a senior member of the clinical team immediately
- Notify the Laboratory and Haemovigilance immediately

The following samples must be sent to the Laboratory if indicated:

- ABO/ Rh group and antibody screen
- Blood cultures
- First voided urine sample for haemosiderin test
- SMAC
- Direct Antiglobulin Test (DAT)
- FBC
- Coagulation
- MSU
- Return implicated unit to laboratory

All Transfusion reaction investigations are treated as urgent.
Send all samples to the Laboratory as soon as possible after phlebotomy to ensure sample integrity is maintained.

10. Blood Sciences Test Profiles:

Biochemistry Test Profiles:

Renal Profile (UEC): Sodium, Potassium, Chloride, Urea, Creatinine and eGFR (where appropriate).

Liver Profile (LFT): Albumin, Alkaline Phosphatase (ALP), Alanine aminotransferase (ALT), Total Bilirubin, Gamma-Glutamyl transferase (GGT), Total Protein

Bone profile: Calcium, Calcium (adjusted), Inorganic Phosphate, Albumin and Alkaline Phosphatase (ALP)

Other Biochemistry tests available:

C-Reactive Protein (CRP)
Creatine Kinase (CK)
Troponin T
Magnesium
Bicarbonate
Human Chorionic Gonadotropin (HCG)
Aspartate Aminotransferase (AST)
Amylase
pro B-Type Natriuretic Peptide (pBNP)
Urate
Glucose

Urine Chemistries:

Urine Sodium
Urine Potassium,
Urine Calcium
Urine Creatinine
Urine Albumin
Urine Albumin:Creatinine Ratio
Urine Total Protein
Urine Protein:Creatinine Ratio
Calculation of Calcium Excretion rate
Calculation of Calcium: Creatinine Molar Ratio
24 hr Creatinine Clearance

Faecal Analysis:

Faecal Occult blood.

Many clinicians request the profile 'SMAC' on request forms, which includes (*depending on the origin of the specimen*):

Biochemistry (SMAC) Profile for RUH hospital patients	Biochemistry (SMAC) Profile for GP and other non-RUH patients.	Biochemistry (SMAC) Profile for aged samples.
Sodium	Sodium	Sodium
Potassium	Potassium (must arrive <4hrs post phlebotomy)	Chloride
Chloride	Chloride	Urea
Urea	Urea	Creatinine ± eGFR
Creatinine ± eGFR	Creatinine ± eGFR	Calcium
Glucose	Calcium	Calcium (adjusted),
Calcium	Calcium (adjusted)	Alkaline Phosphatase
Calcium (adjusted)	Total Bilirubin	Alanine Aminotransferase
Total Bilirubin	Alanine Aminotransferase	Total Protein
Inorganic phosphate	Alkaline Phosphatase	Albumin
Alanine Aminotransferase	Total Protein	Gamma –Glutamyl Transferase will be added if Alkaline Phosphatase result is >104 U/L
Gamma –Glutamyl Transferase	Albumin	
Alkaline Phosphatase	Gamma –Glutamyl Transferase will be added if Alkaline Phosphatase result is >104 U/L.	
Total Protein		
Albumin		

11. PATIENT INSTRUCTIONS FOR 24-HOUR URINE COLLECTION

Important points

11.1. It is very important that all urine passed in an exact 24 hour period is collected. Loss of any urine or a collection made for either more or less than 24 hours will invalidate the tests and might lead to an incorrect diagnosis

11.2. 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.

11.3. If the container contains acid (used as a preservative) or has a warning label, then care needs to be exercised when adding urine from the collection vessel. Hydrochloric acid causes burns and is irritating to eyes, skin and respiratory system. If it comes in contact with skin, wash the affected area 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.

11.4. Ensure that the container is correctly labelled as per table 3.

11.5. Instructions to patient for sample collection

11.5.1. Empty your bladder on rising and throw away the sample. The collection is started after this sample has been passed. Write the start time on the specimen container label.

11.5.2. Collect all urine in the container provided on **every** occasion that it is passed during the following 24 hours and store refrigerated if possible.

11.5.3. Empty your bladder on rising the next morning and add this sample to the collection.

11.5.4. Write the finish time on the container label.

11.5.5. Bring the container to the laboratory on the day of completion.

11.6. Incomplete collections

11.6.1. If a sample is forgotten or lost down the toilet, then all the urine collected to this point should be thrown away and the collection re-started the following morning.

11.6.2. If the incomplete sample is an acid collection, the original container should be returned to the laboratory and a new one requested.

12. ADDITIONAL REQUESTS / SAMPLE RETENTION

If further additional testing is required after the specimen has been sent to the laboratory, please contact the relevant department to investigate the feasibility of using the initial specimen for analysis. If test is feasible you will be requested to forward an additional request form with details of additional tests required.

13. URGENT REQUESTS

All Blood Sciences requests from UCC, MDS, MAU, Radiology and RAC are treated as urgent and are fast-tracked through the laboratory's system. Once authorized, results are available for reviewing on the Ward Enquiry module of the Laboratory Information System (see section 17 for details on accessing results electronically).

All other urgent requests should be labelled as such **AND** the laboratory phoned to advise of the urgency.
Please note that during on-call times **all requests should be phoned to the Medical Scientist on call.** See section 2 of this manual for contact details.
For tests that require urgent referral to Galway University Hospital or another institution please contact the Laboratory to arrange transport.

14. SAMPLE TRANSPORTATION

14.1. Health and safety

It is the policy of the Laboratory to treat all samples as potentially infectious or high risk.
Therefore, we advise that universal precautions are taken in the collection process, packaging, and delivery of specimens to the Laboratory for analysis.
Specimens should always be placed in a biohazard transport bag with the request form placed in the pouch and the bag should be sealed. All samples should be sent to the Laboratory as soon as possible.

14.2. Sample delivery within the hospital

Samples may be sent to the Laboratory via the Pneumatic Tube System (PTS). The following samples must **never** be sent in the PTS:

- Histology specimens
- CSFs

NOTE: The Laboratory is responsible for the maintenance of the PTS. In the event of System failure please notify the Laboratory @ ext. 2258.

14.3. Packaging of diagnostic specimens from outside RUH

It is the responsibility of all persons sending samples to the laboratory to adhere to national and international regulations ensuring that specimens sent to the laboratory do not present a risk to anyone coming in contact with them during transportation or on receipt in the laboratory. Carriage of goods by road must comply with the European Agreement Concerning the International Carriage of Dangerous Goods by Road regulations (ADR) (2012). See Health and Safety Authority website www.hsa.ie for a copy of the regulations.

Specimens may be brought directly to the laboratory and placed in the locked GP SAMPLE BOX just outside the main laboratory door. Ring door bell only if sample is urgent.

14.4. Instructions:

14.4.1. The packaging must be of good quality, strong enough to withstand the shocks and loadings normally encountered during carriage.

14.4.2. The packaging must consist of at least three components:

a. A leak proof primary receptacle e.g. blood collection tube, MSU container;
b. A secondary sealable package to enclose and protect the primary container(s), e.g. plastic specimen bag, approved GP transport containers.
c. Outer package: the secondary package is placed in an outer transport container with suitable cushioning that protects it and its contents from external influences such as physical damage and water while in transit. This must conform to ADR regulations.

14.4.3. For carriage, the outer packaging must be marked with UN 3373 and ‘Biological Substances, Category B’ marked adjacent to the diamond shaped mark.

BIOLOGICAL SUBSTANCE, CATEGORY B

Sending of samples through the post is not permitted.

14.5. Storage of samples prior to transport to the laboratory

Samples should be transported to the Laboratory as soon as possible after collection. **Samples should not be stored in ward areas or in GP practices overnight or over the weekend.** Samples that are not transported in a timely manner to the laboratory may be rejected if there is any doubt about the sample integrity.

15. Procedure for the Transport of Infectious or Suspected Infectious Specimens

15.1. Specimens or samples to be sent should be stored in a secure (preferably plastic) primary container, containing absorbent material.

15.2. Place primary container containing the specimen into a plastic biohazard bag, seal bag.

15.3. State clearly on the request form RCH/BT/F001 or RCH/BS/F001 that the sample is from a possible or confirmed "High Risk" patient.

15.4. Place the request from on the plastic sleeve on the bio hazard bag. Place the name, address and contact number of the originator on the outside of the box.

16. REFERENCE RANGES

16.1. Factors that influence the reference range include:

- The manufacturer of the reagents
- Technology utilised to carry out the examination
- Population/laboratory studies
- Literature/reference books
- Clinical advice

Where appropriate reference ranges are age and gender related and are available on all reports both electronic and paper formats.

Any changes to reference ranges are notified to the clinician for a minimum of a 3 month period following the change and included as a comment on all reports. Any changes to reference ranges will not apply to historical results.

17. REPORTS & ENQUIRIES

17.1. Electronic access to reports

As soon as reports are authorized, they may be viewed within the Ward Enquiry module of the Laboratory Information System. The LIS is a shared system between Roscommon University Hospital, Galway University Hospital and Mayo General Hospital and most results generated and authorised on these sites are available for review on the LIS. Histology results are only available to approved clinicians who require access to these results. Some tests are deemed confidential and are only available to the patients clinician e.g. Genetic testing, HIV testing.

Upon authorisation, Blood Sciences reports for GP patients are released to Healthlink (for all GPs registered with Healthlink).

17.2. Instructions for accessing reports electronically within Roscommon Hospital and SHH

Authorised results (for Roscommon University Hospital, Galway University Hospital or Mayo University Hospital) from the following departments may be accessed as described below:

a) Biochemistry
b) Haematology
d) Microbiology
e) Immunology

Access to results is password controlled. Please contact the laboratory for advice re log on ID and password.

17.2.1. To log on to the Laboratory Information System (LIS), click on the Lab Results icon on the PC  .

17.2.2. In the dialogue box which appears type in your "***Username***" "***TAB***" key and then your "***Password***". Press the "***Tab***" key twice followed by the "***Return***" key OR Click on "***OK***".

17.2.3. Double click on the "***WRNQ***" icon.

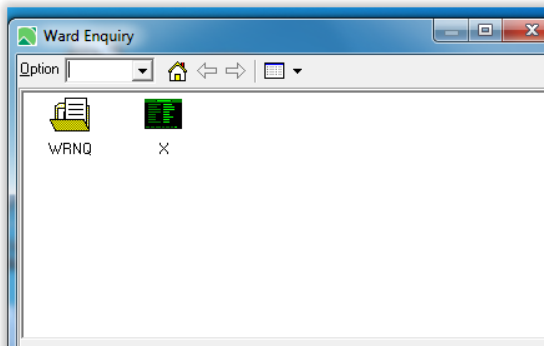

Figure 1. Opening screen of Ward Enquiry

17.2.4. If the patient Board No. number is known:

- Enter the Board No. and the first two letters of the surname and press **Accept** as shown in Figure 2 below.

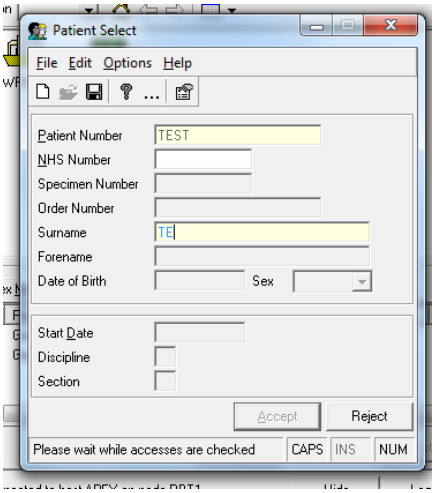

Figure 2. Enter patient details

17.2.5. If the patient Board No. number is not known:

- Type "U" for Unknown in the Board No. field and enter;
- Patients name
- DOB
- Sex

In the pop up screen that is displayed. See Figure 3.
When complete select **Search**

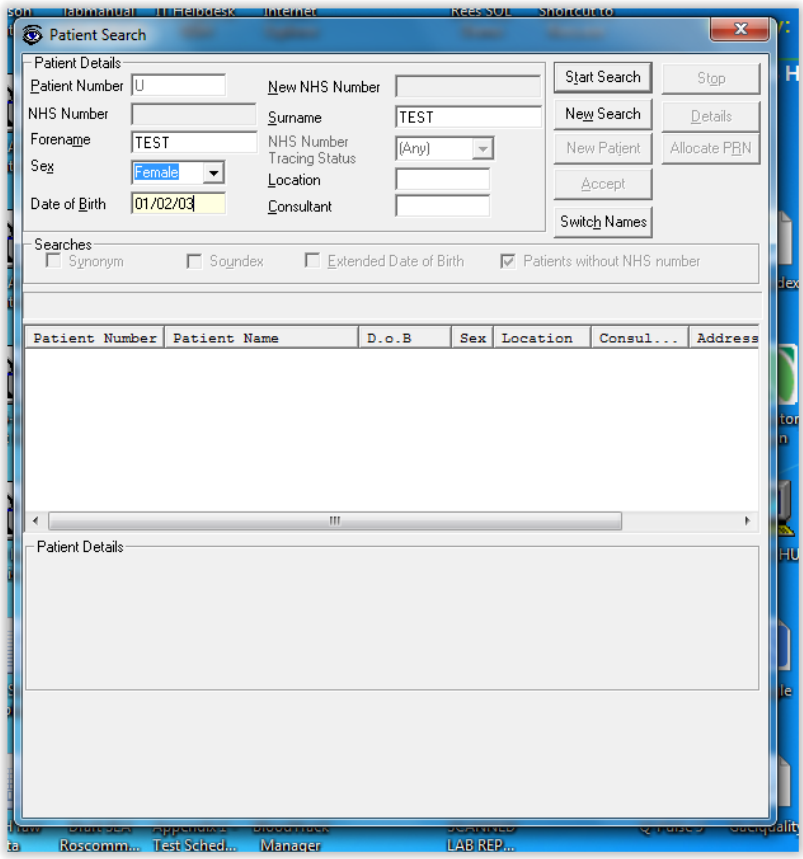

Figure 3 Enter patient details for unknown patient.

A list of available results will be displayed as shown in Figure 4. The most recent results will be at the top of the list. Required results can be selected using the mouse.

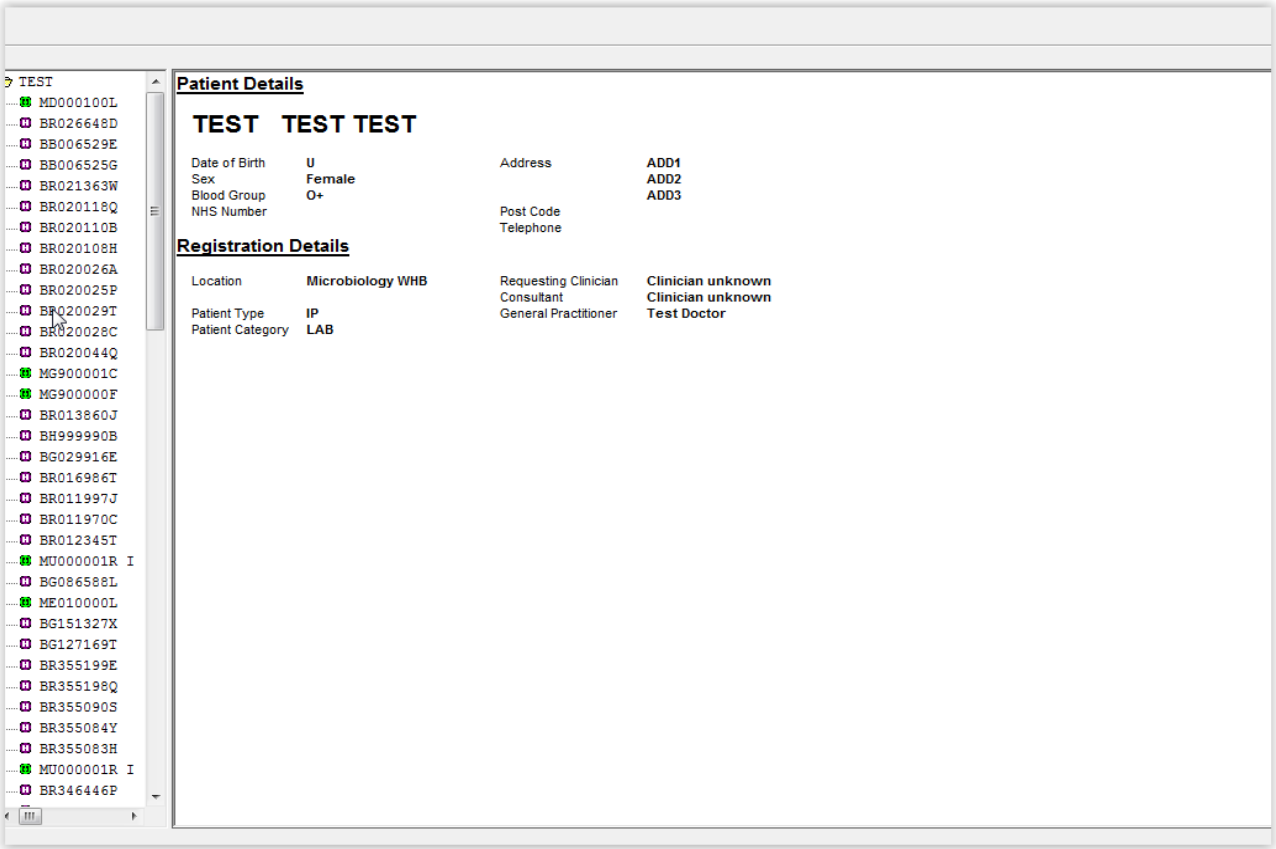

Figure 4. Patient results screen

17.3. Alternatively hospital users can use the same password to access all results using the Web based ward Enquiry option. A shortcut is available in the GUH Useful Resources folder. Double click on shortcut to display log on screen.

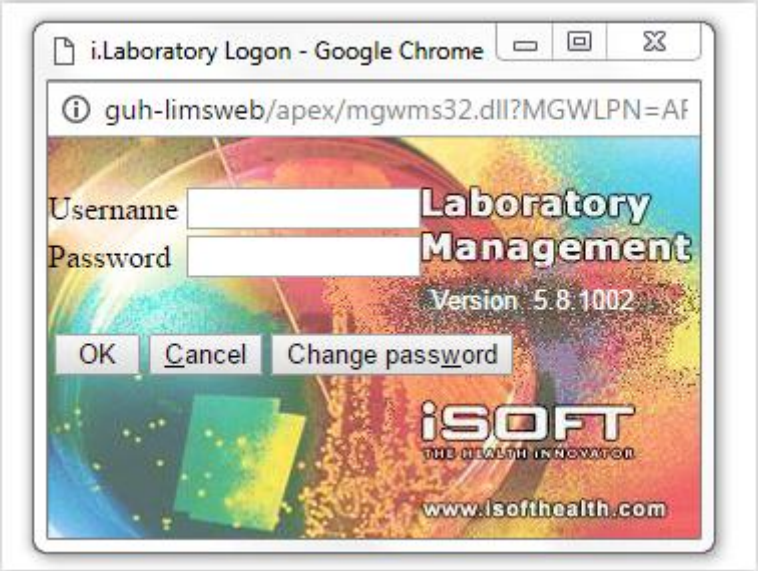

Figure 5. Log on screen for Web ward enquiry.

After entry of username and password the user can search using either the Board No. and first 2 letters of surname or an unknown search using a combination of name/DOB/Sex . See Figure 6 below.

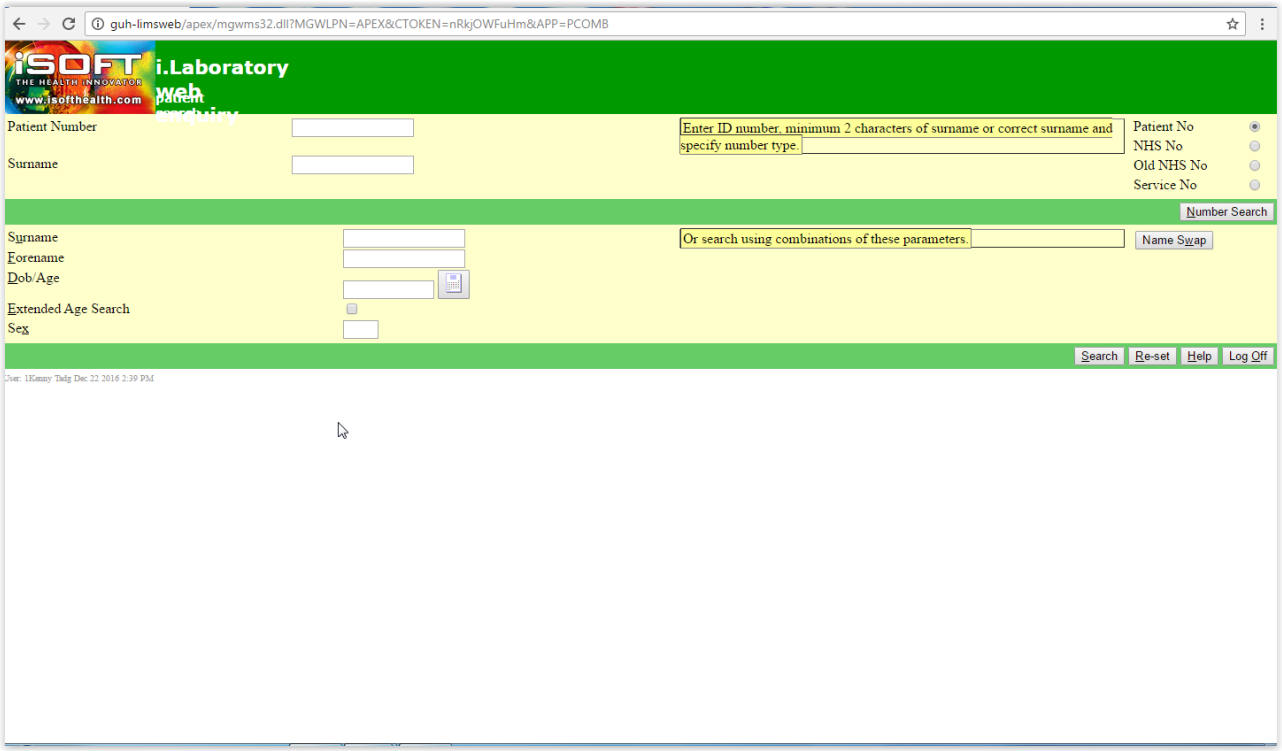

Figure 6. Patient enquiry screen

17.4. RUH referred tests for Blood Sciences may also be viewed using Dartviewer software which must be activated on a users PC by Lab. staff before the can use it. To get access to Dartviewer contact the Laboratory at 2258 or 2131. Full details and training will be provided when the Dartviewer software is activated.

17.5. Appearance of Haematology and Biochemistry unauthorised reports:

If a sample has been received in the Laboratory and testing is not complete then no results will be displayed and a message “In Progress” or “Not Fully Authorised” will be displayed until the all results have been validated.

17.6. Hardcopy reports

17.6.1. RUH hardcopy reports

To facilitate identification, hospital reports are colour-coded as follows:

Department Report colour

Biochemistry White with Green

Haematology White with Purple

Transfusion Pink

Hardcopy reports are delivered to ward areas via the chute system throughout the day. For all other areas (OPD etc), reports are delivered to Medical Records.

17.6.2. Hardcopy reports for patients outside of RUH

Electronic reporting is available via Healthlinks for all registered GP's. For further information on Healthlinks contact 091 775909.
For GPs who receive hardcopy reports and any other organisations who do not have access to electronic reports, they are sent via an Post.
Any reports received in error should be returned to the laboratory.

17.6.3. Reports for referred samples

Reports for specimens that have been referred out for testing will be on hardcopy and in the reporting format as defined by the referral laboratory. Such reports will contain patient demographics, results and interpretations.

For Blood Transfusion details of blood group, antibody investigation results and relevant compatible units will be included.

18. PHONING OF CRITICAL RESULTS

Abnormal results defined in the critical limits table below will be telephoned to the requesting source.
Please note that it is laboratory policy to ask for name of recipient and that results be repeated back when phoned to ensure accurate transfer of information.

Table 8. Critical Limits

Discipline	Test code	RESULTS TO BE PHONED IF
Haematology	Hb	≤ 9.0 g/dl *first time* presentation at RUH and all GP's ≤ 8.0 g/dl every time Delta check failure (≥1.5g/dl change in HB value noted for 2 samples submitted in the last week) every time after all checks are complete.
	Plt	≤100x10^9/l *first time* presentation at RUH and all GP's ≤30x10^9/l every time
	WCC	≤3.0X10^9/L or ≥ 30X10^9/L *first time* presentation at RUH and all GP's
	NEUTS	≤1.5X10^9/L first time presentation for RUH patients and all GP's
	Blasts	After confirmation for *first time* patients only.
	PT	≥30 secs. and no evidence of anticoagulant therapy.
	APTT	≥ 45 secs. and no evidence of anticoagulant therapy.
	INR	≥4
	FIB	≤1.5 g/L
Biochemistry	CRP	≥ 300 mg/L (Unless > 300 mg/L in previous 24 hours and phoned)
	Na	≤120 or ≥ 150 mmol/l
	K	≤ 2.5 or ≥ 6.0 mmol/l
	Urea	For first time presentation ≥ 30 mmol/l
		≥ 50% change in 48 hours (Delta check)
	Creatinine	≥345µmol/L
	eGFR	≤15 ml/min
	GLUC	≤ 2.5 & ≥25mmol/l Not known diabetic
		≥30 mmol/l Known diabetics
	CALC	≤ 1.8 or ≥ 3.0 mmol/l
	ACA	≤ 1.8 or ≥ 3.0 mmol/l
	ALT	≥ 600 U/L
	AMY	≥ 200 U/L
	CK	≥ 700 U/L for ext. patients (GP's, SHH etc.) ≥ 3000 U/L in patients
	Phos	≤ 0.45 mmol/l
	Mg	≤ 0.4 mmol/l
	TT	≥ 20 ng/L for ext. patients (GP's, SHH etc.) ≥ 100 ng/L for *first time* in patients at RUH
Transfusion	Group and Hold or X Match	Positive antibody screen. Discrepancy between current results and historical results. Difficulty in determining patients group. Any other reason that could result in significant delay in providing products requested.
Other e.g. factors known to significantly affect the performance of the examination or the interpretation of the results		Unsuitable samples. If a sample cannot be fully processed for whatever reason e.g. incorrectly labelled, under filled, haemolysed etc. the Lab staff will attempt to contact the Ward or GP. If unsuccessful the result will be available via the LIS or healthlink.
		Any written or verbal requests to phone results when available.
		Amended reports.
First time refers to the first time a result is noted above the values listed for any admission.		

19. E MAILING OF RESULTS

The laboratory follows the HSE Electronic Communications policy regarding transmission of patient information. See http://www.hse.ie/eng/services/Publications/pp/ict/Electronic_Communications_Policy.pdf.
And the HSE Data Protection policy
https://www.hse.ie/eng/gdpr/hse-data-protection-policy/hse-data-protection-policy.pdf

20. TELEPHONE ENQUIRIES

Telephone enquiries for reports should be directed to the laboratory ext. 2258 (09066 32258)
Please note that electronic reports are available as described in section 17 above. Staff should first check for the availability of electronic reports on the LIS or Healthlink before contacting the Lab.

21. TURNAROUND TIMES

The Laboratory has set target turnaround times for all tests performed. See section 26 Alphabetical Test Directory for details.
Turnaround times are determined from the date and time of receipt of the sample in the laboratory to the date and time of authorization. Turnaround times are subject to regular audit.

22. ADVICE and CONSULTATION

Scientific and medical advice on issues within the laboratory's range and competence is available. Refer to Section 2 for a list of all contacts.

23. USER SATISFACTION & COMPLAINTS

There are a number of channels by which comments and complaints may be identified to the Laboratory. In all cases, it is department policy to respond in an open, positive and professional manner to issues raised. Where necessary, adjustment to process may ensue. Complaints should be referred to the Chief Medical Scientist, e mail denise.lally @hse.ie or the Quality Manager marie.ralphs@hse.ie or by telephone and request to speak to the medical scientist in charge.
The laboratory performs annual surveys of user satisfaction. The survey results are circulated and discussed at the annual quality management review.

24. POINT OF CARE TESTING

ABL Flex 90: Arterial Blood Gas Analyser is available in UCC. The blood gas analyser is maintained and quality controlled by laboratory staff. User password is required. Contact the laboratory at 2258 if any problems noted.

Storage time and temperature recommendations
Plastic syringe

- If it is not possible to analyse the sample immediately, analyse it within 30 minutes
- Recommended sample storage temperature is room temperature
- Samples with expected high pO_2 values should be analysed immediately or within five minutes

(Refer to ABL90 FLEX Operator's manual section 12 Sampling)

The parameters available are:
Measured: pH, ChC+, pCO_2, pO_2, Na+, K+, Cl-, Ca++, HB, Glu, Lactate, Bili
Derived: TCO_2, BEecf, tHb(c), BE(B), AG, sO_2(c), HCO_3-(c), HCO_3-std.

Abbott Blood Glucose and Ketone testing: Meters available on all Wards and Out Patient Departments for Blood Glucose Testing. The blood glucose meters are maintained and quality controlled by laboratory staff. User password is required and password is renewed automatically if the user has run and passed the required internal Quality Control samples at least once in past year. Contact the laboratory at 2258 if any problems noted or if re certification is required or user badge ID has changed. Note Ketones are only available on selected meters and these meters will be labelled as "Ketones enabled". It will be necessary to run and pass Ketone controls before any patient tests can be run.

Clinitech Status Urinary HCG testing: Available on St. Bridgets Ward and Endoscopy. The Clinitech status analyser is maintained and quality controlled by laboratory staff. User password is required. Contact the laboratory at 2258 for password setup or if any problems noted.

25. MUSCLE BIOPSIES OR LYMPH NODES.

The Histopathology laboratory GUH, telephone 091524425, must always be notified by the consultant performing the biopsy at least 24 hours in advance.

26. Alphabetical Test Directory

Activated Partial Thromboplastin Time (APTT)

Laboratory:	Blood Sciences
Specimen:	3 mL blood specimens in 3.2% Sodium Citrate tubes (1.0 mL Paediatric tubes are available). Do not refrigerate specimen.
Comment:	See Coagulation screen. Must fill bottle to mark.
Turnaround:	Urgent: 1 hour. RUH: 2 hours. G.P.: 3 hours
Ref. Range:	On report form

Adjusted Calcium

Laboratory:	Blood Sciences
Specimen:	7.0 mL blood in a plain gel tube
Comment:	Calculated parameter
Turnaround:	Urgent: 1 hour. RUH: 2 hours. G.P.: 3 hours
Ref. Range:	On report form

Albumin

Laboratory:	Blood Sciences
Specimen:	7.0 mL blood in a plain gel tube
Turnaround:	Urgent: 1 hour. RUH: 2 hours. G.P.: 3 hours
Ref. Range:	On report form

Albumin (Urine) / Microalbumin

Laboratory:	Blood Sciences
Specimen:	Urine in plain vacutainer – (See table 6 above)
Comment:	Date of collection must be stated on the request form.
Turnaround:	1 day from receipt in RUH
Ref. Range:	Refer to report

Alkaline phosphatase (Alk Phos)

Laboratory:	Blood Sciences
Specimen:	7.0 mL blood in a plain gel tube
Turnaround:	Urgent: 1 hour. RUH: 2 hours. G.P.: 3 hours
Ref. Range:	On report form

Amylase

Laboratory:	Blood Sciences
Specimen:	7.0 mL blood in a plain gel tube.
Turnaround:	Urgent: 1 hour. RUH: 2 hours. G.P.: 3 hours
Ref. Range:	On report form

Bicarbonate

Laboratory:	Blood Sciences
Specimen:	7.0 mL blood in a plain gel tube. Specimen must be tested within 2 hours of draw.
Turnaround:	Urgent: 1 hour. Routine: 2 hours.
Ref. Range:	On report form

Bilirubin - Total

Laboratory:	Blood Sciences
Specimen:	7.0 mL blood in a plain gel tube
Turnaround:	Urgent: 1 hour. RUH: 2 hours. G.P.: 3 hours
Ref. Range:	On report form

Blood Film

Laboratory:	Blood Sciences
Specimen:	3.0 mL K_3 EDTA blood, (1.0 mL Paediatric tubes are available)
Comment:	Blood films will be made, examined and reported on patients FBC results which satisfy the criteria laid down by this laboratory in the guidelines 'Indications for blood film examination'. If a clinician specifically requests a blood film which falls outside of these guidelines this will also be examined where the request form provides clinical details.
Turnaround:	Where clinical details are supplied urgent requests for blood films will receive immediate attention. Routine differentials are reported within 1 day. Turnaround time will be delayed if a blood film is referred to GUH for review by a Consultant Haematologist

Blood Gases (pH, pCO2, pO2, Bicarbonate, Base Excess, Total CO2)

Laboratory:	Available (for patients within RUH only) on Blood Gas analyser located in UCC.
Specimen:	Blood in a Li Heparin syringe. Specimen must be tested within 30 mins of collection @ Room Temperature

Calcium

Laboratory:	Blood Sciences
Specimen:	7.0 mL blood in a plain gel tube
Turnaround:	Urgent: 1 hour. RUH: 2 hours. G.P.: 3 hours
Ref. Range:	On report form

Calcium -ionised

Laboratory:	Available (for patients within RUH only) on Blood Gas analyser located in UCC.
Specimen:	Blood in a balanced heparin syringe

Calcium (Urine)

Laboratory:	Blood Sciences
Specimen:	Spot Urine in plain vacutainer – (See table 6 above) or 24 hour urine sample in acidified container. Spot Urine must be tested within 2 hours of collection.
Turnaround:	Urgent: 1 hour. Routine: 2 hours.
Ref. Range:	On report form

Calcium Excretion

Laboratory:	Blood Sciences
Specimen:	A fasting second-void spot urine sample in plain vacutainer – (*See table 6 above*) for calcium, creatinine and calculation of calcium excretion which is collected at the same time that a fasting blood sample is collected for serum creatinine estimation. (Spot Urine must be tested within 2 hours of collection.)
Comment:	Request forms must state that samples are from fasting patient and that the urine is a second-void sample. Request tests Urinary Calcium/Creatinine excretion and serum creatinine. Both samples should be submitted together where possible. Overnight fast required before samples are collected.
Turnaround:	Urgent: 1 hour. Routine: 2 hours.
Ref. Range:	On report form

Chloride

Laboratory:	Blood Sciences
Specimen:	7.0 mL blood in a plain gel tube
Turnaround:	Urgent: 1 hour. RUH: 2 hours. G.P.: 3 hours
Ref. Range:	On report form

Coagulation Screen

Laboratory:	Blood Sciences
Specimen:	3 mL blood specimens in 3.2% Sodium Citrate tubes, (1.0 mL Paediatric tubes are available). Do not refrigerate specimen. Comment: Profile includes, PT, INR, derived Fibrinogen and APTT. Details of anticoagulant therapy required. Must fill bottle to mark.
Turnaround:	Urgent: 1 hour. RUH: 2 hours. G.P.: 3 hours
Ref. Range:	On report form

Creatinine

Laboratory:	Blood Sciences
Specimen:	7.0 mL blood in a plain gel tube
Turnaround:	1 day from receipt in RUH
Ref. Range:	On report form

Creatinine (Urine)

Laboratory:	Blood Sciences
Specimen:	Urine in plain vacutainer – (See table 6 above) or 24 hour urine sample
Turnaround:	Urgent: 1 hour. RUH: 2 hours. G.P.: 3 hours
Ref. Range:	On report form

Creatinine Clearance

Laboratory:	Blood Sciences
Specimen:	24 hour urine in plain container and 7.0mL blood in plain gel tube taken at some point during the urine collection. It is important that the blood and urine are received in the laboratory as a matched pair.
Turnaround:	Urgent: 1 hour. RUH: 2 hours. G.P.: 3 hours
Ref. Range:	On report form

CRP (C Reactive Protein)

Laboratory:	Blood Sciences
Specimen:	7.0 mL blood in a plain gel tube
Turnaround:	Urgent: 1 hour. RUH: 2 hours. G.P.: 3 hours
Ref. Range:	On report form

D-Dimers

Laboratory:	Blood Sciences
Specimen:	2.7 mL blood in a 0.109m Sodium Citrate tube. Specimen must be tested within 2 hours of draw. One specimen sufficient for D-Dimer and Coagulation screen.
Turnaround:	Urgent: 1 hour. Routine: 2 hours.
Ref. Range:	On report form

Direct Coombs Test

Laboratory:	Blood Transfusion
Specimen:	6.0 mL EDTA K_2E blood or 3.0 mL K3 EDTA blood
Comment:	Sample must be accompanied by a Blood Transfusion request form (RCH/BT/F001) and must be tested within 4 hours of collection.
Turnaround:	Urgent: 1 hour. RUH: 2 hours. G.P.: 3 hours
Ref. Range:	N/A

eGFR

Laboratory:	Blood Sciences
Specimen:	7.0 mL blood in plain gel tube
Turnaround:	Urgent: 1 hour. RUH: 2 hours. G.P.: 3 hours
Comment:	Calculated parameter. Patient gender must be provided Patient age must be greater than 18 years eGFR will be calculated if Creatinine levels are >40 µmol/L and will be reported as a numerical value up to 90 ml/min. Comments to aid interpretation will be provided on the reports.
Interpretation:	On report form

ESR (Erythrocyte Sedimentation Rate)

Laboratory:	Blood Sciences
Specimen:	3.0 mL K3 EDTA blood
Turnaround:	Urgent: 1 hour. RUH: 2 hours. G.P.: 3 hours
Ref. Range:	On report form

Fibrinogen

Laboratory:	Blood Sciences
Specimen:	3 mL blood specimens in 3.2% Sodium Citrate tubes (1.0 mL Paediatric tubes are available). Do not refrigerate specimen.
Comment:	See Coagulation screen. Must fill bottle to mark.
Turnaround:	Urgent: 1 hour. RUH: 2 hours. G.P.: 3 hours
Ref. Range:	On report form

Full Blood Count

Laboratory:	Blood Sciences
Specimen:	3.0 mL K3 EDTA blood, (1.0 mL Paediatric tubes are available).
Comment:	After 24 hours, WBC differential and red cell indices are affected by EDTA changes. Ensure samples are not taken from a drip site as this results in dilution of the sample. In cases of platelet clumping special sample bottles (thrombo exact) are available upon request. For use in platelet counting only.
Turnaround:	Urgent: 1 hour. RUH: 2 hours. G.P.: 3 hours
Ref. Range:	On report form

Glucose

Laboratory:	Blood Sciences
Specimen:	4.0 mL Fluoride Oxalate blood
Comment:	Fasting: Ideally a patient should fast for 12 hours. However, if a patient in unable or unwilling to fast for 12 hours a specimen taken after a 9 hour fast is acceptable".
Turnaround:	Urgent: 1 hour. RUH: 2 hours. G.P.: 3 hours
Ref. Range:	On report form

Group and Crossmatch

Laboratory:	Blood Transfusion
Specimen:	EDTA K_2E 6.0 mL blood
Comment:	Following sample collection any blood product crossmatched using that sample must be transfused within 72 hrs.
Turnaround:	Urgent: 45 mins. Routine: 2 hours.
Ref. Range:	N/A

Group and Antibody Screen

Laboratory:	Blood Transfusion
Specimen:	EDTA K_2E 6.0 mL blood (If sample originates outside RUH please send 2 samples)
Comment:	Following sample collection any blood product crossmatched using that sample must be transfused within 72 hrs.
Turnaround:	2 hours.
Ref. Range:	N/A

HCG, Total

Laboratory: Blood Sciences
Specimen: 7.0 mL blood in a plain gel tube
Turnaround: Urgent: 1 hour. RUH: 2 hours. G.P.: 3 hours
Ref. Range: On report form

INR (International Normalised Ratio)

Laboratory: Blood Sciences
Specimen: 3 mL blood specimens in 3.2% Sodium Citrate tubes, (1.0 mL Paediatric tubes are available). Do not refrigerate specimen.
Details of anticoagulant therapy required.
Must fill bottle to mark.
Turnaround: Urgent: 1 hour. RUH: 2 hours. G.P.: 3 hours
Ref. Range: On report form

Magnesium

Laboratory: Blood Sciences
Specimen: 7.0 mL blood in a plain gel tube
Turnaround: Urgent: 1 hour. RUH: 2 hours. G.P.: 3 hours
Ref. Range: On report form

Microalbumin / Creatinine Ratio

See "Albumin (Urine) / Microalbumin"

Monospot

Laboratory: Blood Sciences
Specimen: 3.0 mL K3 EDTA blood or 7.0 mL blood in a plain gel tube
Turnaround: Urgent: 1 hour. RUH: 2 hours. G.P.: 3 hours
Ref. Range: N/A

Phosphate -inorganic

Laboratory: Blood Sciences
Specimen: 7.0 mL blood in a plain gel tube
Turnaround: Urgent: 1 hour. RUH: 2 hours. G.P.: 3 hours
Ref. Range: On report form

Potassium

Laboratory: Blood Sciences
Specimen: 7.0 mL fresh blood in a plain gel tube
Comment: GP specimens **MUST** be received in the laboratory within 4 hours of venesection or centrifuged.
Turnaround: Urgent: 1 hour. RUH: 2 hours. G.P.: 3 hours
Ref. Range: On report form

Potassium (Urine)

Laboratory: Blood Sciences
Specimen: Urine in plain vacutainer – (See table 6 above) or 24 hour urine sample
Turnaround: Urgent: 1 hour. RUH: 2 hours. G.P.: 3 hours
Ref. Range: On report form

Pregnancy Test

See "HCG Total"

Pregnancy Test (Urine)

Laboratory:	Blood Sciences and Point of Care testing available in St. Bridget's Ward and Endoscopy Unit.
Specimen:	Urine in plain vacutainer
Turnaround:	N/A
Ref. Range:	N/A

ProBNP

Laboratory:	Blood Sciences
Specimen:	7.0 mL blood in a plain gel tube
Turnaround:	Urgent: 1 hour. RUH: 2 hours. G.P.: 3 hours
Ref. Range:	On report form

Protein

Laboratory:	Blood Sciences
Specimen:	7.0 mL blood in a plain gel tube
Turnaround:	Urgent: 1 hour. RUH: 2 hours. G.P.: 3 hours
Ref. Range:	On report form

Protein (Urine)

Laboratory:	Blood Sciences
Specimen:	Urine in plain vacutainer – (See table 6 above)
Comment:	Date of collection must be stated on the request form.
Turnaround:	1 day from receipt in RUH
Ref. Range:	Refer to report

Prothrombin Time (PT)

Laboratory:	Blood Sciences
Specimen:	3 mL blood specimens in 3.2% Sodium Citrate tubes, (1.0 mL Paediatric tubes are available). Do not refrigerate specimen. Details of anticoagulant therapy required. Must fill bottle to mark.
Turnaround:	Urgent: 1 hour. RUH: 2 hours. G.P.: 3 hours
Ref. Range:	On report form

Reticulocyte Count

Laboratory:	Blood Sciences
Specimen:	3.0 mL K_3 EDTA blood, (1.0 mL Paediatric tubes are available).
Comment:	Requests should be received in the laboratory within 8 hours of phlebotomy.
Turnaround:	1 day
Ref. Range:	On report form

Sodium

Laboratory:	Blood Sciences
Specimen:	7.0 mL blood in a plain gel tube
Turnaround:	Urgent: 1 hour. RUH: 2 hours. G.P.: 3 hours
Ref. Range:	On report form

Sodium (Urine)

Laboratory:	Blood Sciences
Specimen:	Urine in plain vacutainer – (See table 6 above) or 24 hour urine sample
Turnaround:	Urgent: 1 hour. RUH: 2 hours. G.P.: 3 hours
Ref. Range:	On report form

Troponin T

Laboratory:	Blood Sciences
Specimen:	7.0 mL blood in a plain gel tube
Turnaround:	Urgent: 1 hour. RUH: 2 hours. G.P.: 3 hours
Ref. Range:	On report form

Urea

Laboratory:	Blood Sciences
Specimen:	7.0 mL blood in a plain gel tube
Turnaround:	Urgent: 1 hour. RUH: 2 hours. G.P.: 3 hours
Ref. Range:	On report form

Uric Acid

Laboratory:	Blood Sciences
Specimen:	7.0 mL blood in a plain gel tube
Turnaround:	Urgent: 1 hour. RUH: 2 hours. G.P.: 3 hours
Ref. Range:	On report form

Urine Protein Creatinine Ratio (PCR)

Laboratory:	Blood Sciences
Specimen:	Urine in plain vacutainer – (See table 6 above): *Early morning* sample preferred
Turnaround:	1 day from receipt in RUH
Ref. Range:	On report form

White Blood Cell Differential Cell Count

Laboratory:	Blood Sciences
Specimen:	3.0 mL K3 EDTA blood, (1.0 mL Paediatric tubes are available) or Blood film. Laboratory will make blood film on fresh blood.
Comment:	White Cell Differential will be done automatically on all fresh FBC specimens. As EDTA artifacts can appear within 2 hours of phlebotomy it is important that films (where neccessary) are made from fresh blood (less than one day old).
Turnaround:	Urgent: 1 hour. RUH: 2 hours. G.P.: 3 hours
Ref. Range:	On report form