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1 Location of Laboratory

Department	Location
Blood Transfusion **Haematology** **Biochemistry** **Specimen Reception** **Microbiology**	Blood Transfusion laboratory on the ground floor alongside the supplies department. **Pod station 01**
External delivery of samples to the Laboratory **8am -8pm Everyday**	From the "set down" facility at the Department of Psychiatry entrance and through the green glass double doors. Turn left off this lobby and follow the signs to the Laboratory entrance on the right.

Access to the Laboratory is strictly controlled and all samples can be left at the Laboratory reception.

2 Laboratory Contact Details

Postal address
Pathology Laboratory
St. Lukes General Hospital
Freshford Rd.
Kilkenny.
R95 FY71
Telephone Numbers

Note *Please use the ward enquiry facility for all Laboratory results
Insert (056) 77 before extension number for direct access from outside the hospital

	Contact Name	Phone/ Bleep
Director of Laboratory & Consultant Haematologist	Laboratory Management Team: Dr Brian Hennessy Ms Niamh Lacey Lab Manager	UHW Ext 051 848746 (Secretary)
Laboratory Manager		85701
Chief Medical Scientist Biochemistry/…..	Regina Walsh	17546
Chief Medical Scientist Blood Transfusion/Haematology	Helena Holland	17571
Biochemistry Dept	Margaret Smithwick	85734
Blood Transfusion Dept	Caroline Gannon	85483 BT Laboratory
Haematology Department	Shane McCarthy	85371
Major Haemorrhage Emergency Phone	Rotational	9-5 Monday to Friday 85798

		On call: 17296/Switch
Haemovigilance CNS	Tracey Woods	Ext: 85417 Bleep:85417
Near Patient Testing (POCT)	Yvonne Dowling	17147
Specimen Reception Specimen Dispatch	Piroska Gregan/ Lorraine Codd/Anusha Subasinghage	85734
Laboratory Administration	Mary Ryan/Mgt Talbot	85353
Pathology Department Fax Number		056-7764259
Quality Officer	Eimear Croke	17137
Medical Scientist Emergency On-Call	Rotational	17296

- Please use the ward enquiry facility for all Laboratory results
- For all direct enquiries contact Laboratory secretary at 85353.
- All enquiries for laboratory results from outside the hospital must be emailed to the laboratory. Results will then be emailed back by laboratory administration. SLK.labresults@hse.ie
- Blood Transfusion enquiries contact 056-7785483.
- External results ensure to contact between 16.00 – 17.00.

We regret we are unable to deal with result enquiries externally after 17.00hrs.

Referral Laboratory Contact Details

Laboratory	Telephone	Website Address
University Hospital Waterford	Specimen Reception: 051 - 842470	www.hse.ie/eng/services/list/3/acutehospitals/hospitals/waterford/
Eurofins Laboratories	(01) 2958545	www.eurofins.ie
Irish Blood Transfusion Service(IBTS)	(01)4322800	www.giveblood.ie
National Centre for Medical Genetics	(01)4096840	www.genetics.ie
National Centre for Hereditary Coagulation Disorders(NCHCD),St. James Hospital	(01) 4162956	www.stjames.ie
St James Hospital (SJH) Haematology	(01)4162048	www.stjames.ie
National Virus Reference Laboratory (NVRL)	(01)7161323	www.nvrl.ucd.ie
Children's University Hospital, Temple St	(01)8784200	www.cuh.ie

Our Lady's Hospital for Sick Children , Crumlin	(01)4096100	www.olchc.e

3 Laboratory Opening Hours

Pathology Laboratory	Opening Hours
Routine Laboratory Diagnostic Service	
All Departments	Monday to Friday 08:00 - 17:00
Note: Cut of Times for Routine Specimens	
Haematology / Biochemistry	16:00
Blood Transfusion Sample for next day elective pre op	15.30 Must be received before 19.00
GP Samples	Mon-Fri 15:00
Emergency On Call service*	
Monday to Friday	20.00 - 08.00
Saturday / Sunday + Public Holidays	24hr

3.1 Emergency On Call service

*** Emergency On Call service Contact 17296 / Switchboard**

- Only emergency samples should be sent to the laboratory out of hours
- Contact Medical Scientist on **17296** or through Switchboard
- The Medical Scientist is always on site, however he/she should be contacted regarding clinically urgent bloods especially during the night.
- All Group & Screen samples from the Acute Floor and Maternity (excluding cord bloods) are processed on call. Any other Group & Holds received out of hours require clinicians to provide clinical details and contact the lab directly.

Tests available on call:

Only Emergency / urgent samples will be processed on call

Department / Test 'On Call'	Comments
Blood Transfusion	
Group and Screen (Type and Screen)	For patients where crossmatch may be required. If a group & screen sample is required to be processed out of hours where a crossmatch is not required **you must contact** the medical scientist on call.
Crossmatch	In accordance with MBOS
Emergency Issue of Blood	Must Phone Medical Scientist on call
Neonatal/ Paediatric Group and or DCT Coombs	Contact Medical scientist on call if required

Department / Test 'On Call'	Comments
Cord Blood	***Not available except for the presence of maternal antibodies, where DCT is then urgent, or when approaching 72hrs post natal ,when received at weekend will be processed within 24 hrs
Biochemistry	**Only where clinical need requires**
All Biochemistry samples with the exception of Procalcitonin done in SLH are available on call where clinically required.	
Haematology	
FBC	
Coagulation Screen	
D-Dimers	
Blood Film	Available by Consultant request if urgent referred to UHW
Microbiology	
Blood Cultures	Incubated on receipt in lab
Paediatric urines	Limited Microscopy
SARS-CoV-2 Test	9am-4pm Mon-Fri / 9am-2pm Saturday/ Sunday/ Public Holidays

3.2 Advisory Services

Advisory services are available at consultant level for Blood Transfusion & Haematology 24 hours a day, seven days a week via consultants through telephone support.

Advisory Services include:

- Advising on Individual Clinical Cases
- Professional judgements on interpretation of examinations
- Advice on use of Specialised Blood Products 10.10
- Advice on Coagulation disorders & specialised testing 11.3

Contact Details

Contact	Phone Number
Dr. B. Hennessy - Consultant Haematologist (Main Contact for St. Lukes General Hospital) Based at University Hospital Waterford	051-848746
Haematology Registrar University Hospital Waterford	051-842105
Tracey Woods Haemovigilance Clinical Nurse Specialist-	Ext/Bleep 85417 or via lab

In order to effectively utilise laboratory services certain examinations require consultant authorisation these include:

Test	Sample Type	Clinical Indication	Limitations
Urgent Specialised Coagulation / Factor Assays	Sodium Citrate	Refer to Thrombophilia Guidelines on UHW website.	
Immuno-phenotyping	EDTA	Haematological Malignancy	Only on consultant haematologist request
Test for HFE mutation		Suspected Haemo-chromatosis	Transferrin saturation result must be examined first. Eurofins consent form required from Patient.
Cancer molecular diagnostics		Need Consultant authorisation to perform test.	

3.3 Emergency Laboratory Contingency Plans

A contingency plan is in place to ensure that essential services are available during emergency situations or other conditions when laboratory services are limited or unavailable.

For St Luke's laboratory a Major Emergency is any event either internal or external that causes, serious disruption of essential services or damage to property, the environment or infrastructure beyond the normal capabilities of the hospital laboratory. There is a procedure in place to which the laboratory will operate in event of a major Emergency occurring.

The laboratory also operate under the St Luke's Hospital Kilkenny major emergency plan SLGH-GEN-016 by following Action Card No 21, the laboratory function in this scenario is to ensure requests from the Emergency Department and other areas are dealt with as quickly and as efficiently as possible.

4 Collecting Primary Samples

4.1 Health & Safety

Each department has a site specific safety statement available, this policy should be adhered to at all times.

4.1.1 General Safety Guidelines

- Always use approved specimen collection containers and ensure lids are securely closed.

- Observe standard precautions when taking patient specimens. Refer to HSE SE policy for Standard precautions & Personal Protective Equipment/ Clothing (PPE).
- Always dispose of sharps appropriately and according to the HSE SE policy for the safe Use, handling and disposal of sharps and sharps containers.
- Specimens must be placed in approved biohazard bag with request form placed separately in the sleeve provided.
- Do not place specimen and form together in the same pouch of the biohazard bag.
- Always supply clinical information including known infection risk with each request.

4.1.2 Specific instructions on specimen transport are outlined in 6.6 of this document.

4.1.3 Model rules to ensure staff safety during specimen transport are outlined in 6.10

Any spills must be dealt with in accordance with local Health and Safety policy.

4.2 Laboratory Supplies

Supplies of specimen containers, request forms and specimen bags are available from **central stores** for SLGH/KROH service users.

The **only** consumables supplied directly by the Laboratory are the following:

- Blood Culture bottles
- Viral, high nasal and Chlamydia swabs
- Flu swabs /SARS-CoV-2/RSV Swabs
- University Hospital Waterford Laboratory Request forms
- Blood Collection & Traceability Forms for use in SLGH , KROH & Aut Even hospitals
- Cervical Cytology Request forms & Containers
- Acidified 24hr urine containers
- Quantiferon Kits

Please ensure that all supplies are requested during routine hours only. All supplies for GPs are sent via the Laboratory Supplies Department in University Hospital Waterford, apart from SLGH request forms.

4.2.1 Types of specimen containers

Adult Vacutainer Specimen Bottles		
Cap Colour	**Anticoagulant**	**Test**
Yellow	Clotted (No Anticoagulant)	All serum tests
Grey	Fluoride Oxalate	Blood Glucose/ Lactate/EtOH
Purple	E.D.T.A	FBC/ESR/TnI/BNP
Green	Lithium Heparin	Plasma tests
Blue	Sodium Citrate	Coagulation tests
Pink	E.D.T.A	Blood Transfusion tests

Paediatric Specimen Bottles		
Cap Colour	**Anticoagulant**	**Test**
Red	E.D.T.A	FBC/ESR
Yellow	Fluoride Oxalate	Blood Glucose/Lactate
Orange	Lithium Heparin	Plasma tests
Green	Sodium Citrate	Coagulation tests
Pink (Adult Size)	E.D.T.A	Blood Transfusion Tests
Clear	Clotted (No Anticoagulant)	All serum tests

Other Specimen Containers	
Container	**Test**
Heparinised Syringe	Blood Gases
24 Hour Urine Container	24 Hour Urine
Quantiferon bottles	ZN/ TB testing
Blood Culture Bottles	Blood Culture Analysis
Nasopharyngeal and /or Oropharyngeal swabs	SARS-CoV-2 Assay/Flu/RSV

4.3 Positive Patient Identification

For St Lukes Patient identification policy developed by the Patient Identification Committee SLGH, please refer to SLGH doc hub or the link below:
https://assets.hse.ie/media/documents/Patient_Identification_Policy_2023_SLGH.pdf

4.4 Phlebotomy

The Phlebotomy service provided in St. Lukes General Hospital is not located in the Pathology Laboratory.
The Phlebotomy service is managed by the Director of Nursing. Contact number - Bleep 5450.
The Phlebotomy department does not routinely provide a service for GPs

4.5 Patient Consent

Explain procedure to the patient and ask for consent. The hospital follows the national HSE consent policy
https://assets.hse.ie/media/documents/ncr/hse-national-consent-policy-easy-to-read-amended-proof04.pdf
For most routine laboratory procedures consent can be inferred when the patient willing submits to the collection.
For genetic testing documented consent must be obtained by the requesting clinician. The request form for these referred tests provides space for the recording of such consent.

4.6 Selection of Primary sample container / volume /requirements

For details on primary samples required for all examinations performed in SLH laboratory refer to each department section:

Blood Transfusion Section 10.1
Haematology Section 11.1

Biochemistry Section 12.1
Microbiology Section 13.1

A controlled list of external test requirements is also available in the appendices of this document, also see:

- SLH-LAB-LF-016 Sample requirements for Adult Tests & external referrals
- SLH-LAB-LF-017 Sample requirements for paediatric Tests & external referrals

However to ensure the most up to date external referral sample requirements refer to UHW user manual which is available on the Lab Web Enquiry icon on all desktops.
It is also available on the UHW website.
Under Departments Click on Laboratory Services then in the test library search all tests from A-Z by name for all required information.

For examinations that are not offered by UHW refer the lab at SLGH or to Biomnis website: http://www.biomnis.ie
Select Test Information then Test Guide, now selects the department and then the actual examination that you require for all required information on sample collection.

4.7 Primary Sample Collection

Prepare the following equipment –In a clean procedure tray with a sharps container

- Venepuncture needle- Greiner System (Sarstedt for paediatrics)
- Blood specimen bottles- Greiner System (Sarstedt for paediatrics)
- Check the expiry dates on the sample tubes. Do not use sample tubes that are past their expiry date.
- Personnel protective equipment (e.g. gloves, apron etc)
- Skin disinfectant (70% impregnated)
- Alcohol hand rub/gel
- Clean tourniquet
- Topical anaesthetic agent if prescribed
- Blood request form/biohazard bag for transport of samples
- Sterile cotton wool gauze
- Sterile plaster/ band aid.

4.7.1 Do not draw blood from an arm with an infusion in progress. When infusions are in place on both arms ask staff if one can be switched off for 3 minutes minimum to allow venepuncture to take place. Advise staff when procedure has been completed.

4.7.2 Verify that the patient meets pre examination requirements e.g. anti-coagulant therapy/confirm that the patient is fasting if a fasting sample is required. Certain dynamic function tests require timed collections. Each blood bottle must be clearly labelled with the time of sampling in such cases. The timing of certain tests such as therapeutic drug monitoring will be dependent on the medication status of the patient.

4.7.3 Risk of infection: Ensure that samples which pose a risk of infection to staff (e.g. HIV, Hepatitis or TB etc) are clearly identified with a yellow/red biohazard sticker attached to the request form and all sample bottles.

4.8 Procedure for Venepuncture

Consult SLGH Guideline for Undertaking Peripheral Intravenous Cannula in Adults Document Reference No: SLGH PD 006 on SLGH Doc Hub or the link below:
https://assets.hse.ie/media/documents/Undertaking_Peripheral_IV_Cannulation_in_Adults.pdf

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

4.9 Order of Draw

Blood Cultures for Microbiology should be taken before any blood samples.

Adult Sample Type	Test	Paediatric Sample Type
	Coag, INR, APTT PT, D-Dimers	
 AE/MAU/Onc/ICU  All Others	UE, CA, PO4, MG, LFT-AST, ALT, Alk Phos, TBILI, DBILI, TP, ALB, GGT, CRP, Amylase, CPK, Uric Acid, Acetominophen (Paracetamol), Chloride,	

	Na, K, Urea, Creatinine, PCT, BHCG	
	**Full Blood Count Troponin/BNP Monospot**	
	**Crossmatch DCT Group & Save Transfusion Reaction Investigation**	
	**Glucose, Lactate, Alcohol**	
	**Urine Microscopy (Paeds Only)**	
	**Paediatric FBC Only**	

4.10 Factors that may affect the performance of the test / Interpretation of Results:

- Incorrect volume of specimen.
- Specimen clotted inappropriately.
- Haemolysed samples
- Lipemic/ icteric samples.
- Mixing blood and tube additives. (All tubes must be completely inverted 8 times after filling, except coagulation tubes which are inverted 4 times)
- Mixing ratios for Coagulation Specimens
- Specimens received too old for analysis

- If collection from a horizontal catheter is unavoidable, avoid contaminating the sample with remains of infusion solution.
- **Samples should never be poured from one tube into another tube**, even if the tubes have the same anticoagulant.

Even a slight haemolysis can cause increased serum/plasma values e.g. Potassium, Bilirubin, AST,LDH, PO4. The following errors lead to haemolysis and should be avoided in any case;

- Tourniquet applied too tightly.
- Failure to release tourniquet
- Needles with too small diameter being used.
- Aspiration of tissue fluid after puncturing vein.
- Transfer of blood into other containers with a syringe.
- Shaking the sample instead of mixing.
- Delayed separation of cells from serum/plasma >3 hours.
- Using an improperly attached needle and syringe so that frothing occurs
- Forcing blood into collecting tube
- Failure to allow alcohol to dry
- Very slow flow into collection tube
- Drawing blood from indwelling line
- Drawing blood from a bruised area.

5 Labelling, Storage, & Transport of Specimens

5.1 Labelling the Primary Specimen

5.1.1 It is essential that all specimens are labelled with a minimum of three identifiers for Blood Transfusion, and two identifiers for other departments.

5.1.2 Always use sample collection tubes that are in date. Blood taken into expired collection tubes may render the specimen unsuitable. Specimen tubes must **not** be pre-labelled.

5.1.3 The following identifiers should be placed on the specimen mandatory identifiers are highlighted:

Haematology/Biochemistry /Microbiology Specimen
Patients **FULL** name
D.O.B and/or hospital number
Date and time of specimen collection
Identity of specimen collector.
Collection time.

Blood Transfusion Specimen

Details on specimens must be: Labelled with Blood Track Printed Label /handwritten. (Addressograph labels are **not** accepted). Details on the sample **MUST** include:
Patient's **FULL** name
D.O.B
Hospital Number
Signature of phlebotomist (electronic if using Blood Track)
Time and Date of Sampling

5.1.4 Specimens for Blood Transfusion **must be**:

- Labelled with Blood Track Printed Label OR
- Handwritten
- Addressograph labels are **not** accepted

5.1.5 Specimens for Blood Sciences must be:

- Labelled with addressograph or Blood Track label
- Where no addressograph labels are available clear handwritten labelling is accepted.

5.1.6 Specimens for Blood Culture should not have the barcodes removed prior to transport to the laboratory.

5.1.7 Specimens will be rejected if the essential requirements are missing from the primary specimen.

5.1.8 Request form should include clinical information details including history of administration of drugs e.g. anti-coagulant therapy

5.1.9 Neonates, Unconscious Patients and Patients Unable to Identify Themselves

This includes adult patients who are undergoing general anaesthesia, unconscious, confused patients or patients whose first language is not English and neonates.

- Verify that the details provided match that indicated on the hospital ID band, forename, surname, unique hospital number, date of birth and gender in the case of an infant.
- Baby is sufficient as a forename for infant patients i.e. Baby Murphy.
- For twins or triplets the forename may be Twin 1, Triplet 2 etc.
- This information must be identical with the information on the request form and specimen tube sent to laboratory

5.1.10 Urgent Specimen from an Unidentified Patient

In the occasional event of an urgent specimen from a "moribund" patient, where identity cannot be confirmed the minimum identifiers are:

- Gender
- Unique number

This essential information must be provided on both request form and specimen.

The Unique hospital number is obtained from IPMS system and is essential on their identification arm band for positive patient identification.

5.2 Available Request Forms

SLH	Form
Blood Transfusion	Red Transfusion Request Form (SLH-BT-LF-015)
Biochemistry & Haematology	St. Lukes Pathology Request Form (SLH-LAB-LF-001)
Metabolic / Hypoglycaemic work up's from paediatrics require a separate form available on Paediatric ward or Lab	SLH-BIO-LF-017
Specialised external tests which require special handling such as freezing etc. prior to dispatch Hand to lab staff directly & inform of need for freezing.	Must be sent on St. Lukes Pathology Request Form (SLH-LAB-LF-001)
Microbiology CSF	St. Lukes Pathology Request Form (SLH-LAB-LF-001) in addition to UHW request forms
SARS-CoV-2	SLH-LAB-LF-035 Gene Xpert Request Form
UHW Referral	**Form**
UHW Haematology and Biochemistry	Green UHW Blood Sciences Request Form WRH-PATH-LF-229
UHW Antenatal Blood Transfusion	Purple UHW Blood Transfusion Laboratory Request Forms. WRH-BT-LF-115
Microbiology	Yellow UHW Microbiology request form
Immunology	Blue UHW Immunology Request Form
Serology	Pink UHW Virology/ Serology Request Form
Histology	White UHW Histology Request Form WRH-HIS-LF-001
External Referrals	**Form**
External referrals	Refer to SLH-LAB-LF-016; SLH-LAB-LF-017 Referral forms available in the Laboratory

5.3 Completion of Request Forms

Please complete all sections of request forms in a fully legible manner

Discrepancies or omission of essential information may result in the specimen not being analysed.

Up to date Addressograph labels are acceptable on laboratory request forms.

Pathology Request Form

Pathology Request Form (mandatory information highlighted)
Patient's **FULL** name **D.O.B. and/or hospital number** Patient's Gender
Patient 's Address /Location
Patient Consultant or GP/ GP code
Hospital & Ward or GP Address
Date & Time of Specimen collection
Type of Specimen / Site of origin where relevant
Tests Requested
Verification that patient meets pre-examination requirements e.g. Fasting status / time of last dose
Specific Clinical Information

Blood Transfusion Request Form

Blood Transfusion Request Form (mandatory information highlighted)
Patient's **FULL** name **D.O.B.** **Hospital Number** Patient's Gender Time and date of specimen and signature of phlebotomist
*Provide a clear, unambiguous reason for transfusion
Patient Consultant or GP/ GP code
Hospital & Ward or GP Address
Tests requested and Specific Clinical Information
Signature & Contact No. of the person requesting the test
Number of units of blood required date and time required
Transfusion history/history of administration of Anti-D/Antenatal history etc. is also relevant
Specific transfusion requirements for individual patients. If modified blood components are required e.g. CMV negative and/or Irradiated, this should be indicated on request form
A clear indication as to whether the tests/services requested are urgent or routine.

*The British Committee for Standards in Haematology "Guideline on the Administration of Blood Components 2009" require: *As a minimum, the request should contain - information on the*

patient's diagnosis and any significant co-morbidities of relevance to transfusion - provide a clear, unambiguous reason for transfusion. Terms such as 'Pre-op', 'Anaemia' or 'Low Hb' alone are not acceptable and provide inadequate information for audit purposes.

5.3.1 For Blood Culture specimens identify the specimen source and /or specific site correctly so that proper culture media will be selected during processing in the laboratory. Special requests such as Diptheria, actinomyces, nocardia etc. should be noted on the microbiology request form.

5.4 High Risk Specimens

5.4.1 It is the policy of the laboratory department to treat all samples as potentially infectious or high risk. Therefore it is advisable to take universal precautions in the collection, packaging, and the delivery of samples being sent to the laboratory for analysis.

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

5.4.3 It is the responsibility of the requesting clinician to ensure that samples which pose a risk of infection to staff (e.g. HIV, Hepatitis or TB etc.) are clearly identified with a yellow/red biohazard sticker attached to the request form and all sample bottles.

5.4.4 It is a requirement that laboratory specimens from patients who have known or suspected Risk Group 3 infections be labelled in such a manner that this knowledge be conveyed to the laboratory. Specimens from these patients should be labelled Biohazard or Danger of Infection.

5.4.5 The specimen container should be labelled on the outside and clearly visible. The accompanying paperwork should be appropriately labelled.

5.4.6 It is good practice for those requesting tests to provide as much information as is relevant, consistent with maintaining patient confidentiality, with any request for a laboratory investigation.

5.5 Pre Analytical Specimen Storage

Ideally all specimens should be transported to the Laboratory in a timely manner and should arrive within a suitable time frame for required analysis.
The sender should ensure to avoid extreme ambient transport temperatures, as this could be detrimental to sample quality.
Where transport is delayed for example in an out of hours situation samples may be stored in a fridge.
Exceptions to this include:

5.5.1 Haematology:

Samples for Coagulation & PCR, should be stored at room temperature. Do not store in fridge.

5.5.2 Biochemistry

Samples for renal function tests should not be stored in the fridge

5.5.3 Microbiology

Specimens should be transported as soon as possible. If processing is delayed, refrigeration is preferable to storage at ambient temperature, with the exception of Blood cultures and Cerebro-spinal fluid which should be held at room temperature

5.6 Transport of Specimens

As above all samples should be transported:

- Within an appropriate timeframe for examinations requested
- Within a temperature interval specified above
- In a manner that ensures the integrity of the sample and safety of the carrier, the general public and the receiving laboratory see model rules for transport of specimens.

Samples should be placed in specimen transport bags as soon as the sample has been taken. The St. Lukes Pathology request form has its own sample transport bag attached.

However some samples for UHW laboratory may require separate “Guard” bags for each patient.

The sample/s should be placed in the sealable pocket of the transport bag and this should then be closed properly.

The request form/s should be placed in the open compartment so that in the event of leakage the request forms are not contaminated and the leakage is contained.

Large specimens such as some histology specimens or 24-hour urines should be put in large specimen bags and the request form placed in the outer pouch.

Please follow the Procedure for the Internal Transport of Laboratory Specimens (SLH-LAB-LP-004).

5.7 Transport of Internal Specimens to the Laboratory

5.7.1 In St. Lukes General Hospital a pneumatic tube chute transports samples internally from the following locations:

St. Lukes Hospital, Kilkenny

aerocom AC3000 Pneumatic Tube System

24/7 Support: 018413005

Directions for Use:

1. Place the items to be transported into the Carrier
2. Dial the Destination Address Number
3. Place the Carrier into the Sending Funnel

ZONE 1		ZONE 2	
Address	Destination	Address	Destination
01	Laboratory	14	ASU
02	Pharmacy	15	Surgical 3
		16	SMU Day Surgery
03	Oncology	17	Surgical 1
04	DSU	18	Labour Ward
05	Hepatology	19	Ward 7
06	Resus	21	SCBU
07	MAU	22	Paediatrics
08	A&E		
09	MRI		
10	Barrow Ward		
11	Nore Ward		
16	Suir Ward		
20	Phlebotomy	**Support: 01 8413005**	

Your Chute is Zone 1: 01 Laboratory

5.7.2 On-call send urgent samples to the lab through the chute immediately, routine samples out of hours can be sent in batches.

5.7.3 A dedicated porter also transports the specimens to the laboratory from areas with no access to chute system.

5.7.4 Specimens are collected from the wards at hourly intervals throughout the day as per the portering schedule from 08.00 to 16.30 hrs. Use the porter mobile phone (086) 0273291 for urgent blood collections during routine hours and Urgent and On Call samples requiring collection should be notified to porter control.

5.7.5 Internal transport boxes are available for the safe carriage of bloods to the Laboratory. All blood samples are collected from designated collection points on each ward.

5.8 Transport of External Specimens to and from SLH Laboratory

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

5.8.2 The Laboratory Transport procedure SLH-LAB-LP-004, describes how all samples are transported externally from St. Lukes General Hospital. All specimens transported by road must comply with the ADR transport regulations. All specimens should be packaged as per the ADR P650 Packaging Instruction. *Appendix 1*

5.8.3 It is the responsibility of the sender to ensure that specimens are transported in accordance with ADR. ADR compliant packaging should always be used. This also applies to specimens sent by post.

5.8.4 The Laboratory is equipped with packaging materials and containers, which comply with the requirements of ADR.

5.8.5 The sender should ensure to avoid extreme ambient transport temperatures, as this could be detrimental to sample quality.

Dispatch Times to University Hospital Waterford and other External Sites

Collection Point	Collection Time	Comments
Kilkenny Area		
Pathology Laboratory St Lukes Hospital	• 07: 30 & 11:00 Monday to Friday • Saturday/Sunday/Bank Holiday Monday 09:30 • All urgent samples for dispatch to UHW outside of these times must be communicated to the Laboratory in St. Lukes.	Transported to UHW by taxi service or courier. Samples dispatched to all other external sites at 11:00 daily, with next day delivery guaranteed. Same day delivery to external hospitals must be communicated to the lab for arranging prior to 10am. Samples to overseas destinations are sent by courier with next day / 48 hr delivery options as required.

5.9 Transport of High Risk Samples

Specimen containers that are contaminated externally must not be sent to the laboratory.
High risk specimens should be identified.
Samples which are suspected or known to contain certain risk group 3 or 4 pathogens are classified as infectious and are packaged as per SLH-LAB-LP-008. The laboratory stocks specific infectious packaging for such samples (UN approved class 6.2 packaging).

5.10 General Guidance for Transport of Specimens

This policy applies to all porters working in the laboratory and to the porters and clinical staff who deliver specimens to the laboratory.
Some of the work carried out by laboratory/ hospital porters and clinical staff in the hospital may involve accidental contact with material that could be infectious. However, wherever they might be working they should observe the following guidelines:

- Cover any cuts or grazes on your hands with a waterproof dressing.
- Carry all specimens in the trays and boxes provided, not in your hands or pockets.
- Touch specimen containers as little as possible. If you do touch them, wash your hands as soon as practicable afterwards.
- Always wash your hands before meal breaks and at the end of duty.
- If a specimen leaks into a tray or box, tell the laboratory reception staff and ask them to make it safe.
- If you drop and break a specimen, do not touch it or try to clear up the mess. Stay with the specimen to prevent other people touching it and send someone to the laboratory for help. Report the accident to your supervisor as soon as possible.
- Handle specimen containers gently at all times.

6 Laboratory Specimen Reception

- All samples received in the laboratory for processing in SLH have the date & time of receipt recorded on the request form.
- Trained Laboratory personnel will evaluate the specimens to ensure that they meet the relevant acceptance criteria, see Laboratory Policy on Mislabelled Forms/Samples below.
- Sample is rejected if essential criteria are not correct.
- When specimens are being sorted and numbered all discrepancies are documented on the request form.
- Laboratory staff are not permitted to amend details on specimens or request forms.
- Addressograph labels will be accepted on specimens **except** for Blood Transfusion specimens.
- Blood Track printed labels will be accepted all specimens including blood transfusion.
- Identification criteria for crossmatch specimens and request forms are as laid down by the Hospital Transfusion committee.
- Staff should err on the side of caution and never process a discrepant specimen unless they have good reason to believe that the specimen belongs to the person identified on the request form/sample
- Users will be informed if a decision is made to reject a specimen.
- All samples will be held in the laboratory for at least 48 hours
- All specimens are then labelled with a unique laboratory accession number, they are then recorded in the LIS linking the unique laboratory accession number to the patient's details provided on the request form.
- Upon receipt of a sample whose integrity was compromised or which could have jeopardised the safety of the carrier or the general public the laboratory informs the sender of the primary sample immediately. The sender will be informed about measures to be taken to prevent reoccurrence.

6.1 Urgent Sample Receipt

If samples are received in specimen reception marked as urgent, as outlined in SLH-LAB-LP-005, they are labelled using designated yellow labels. In addition all samples from RESUS/ED/MAU/ICU/CCU/SCBU and Oncology are automatically given priority and labelled yellow.

These samples are then transferred to the appropriate area of the laboratory as soon as possible & processed in rapid mode according to local policies available in individual departments.

6.2 Secondary sampling of primary specimen

If separation of the primary sample into a secondary container is required for any reason all portions of the primary sample must be an unequivocally traceable to the primary sample.

This is achieved by ensuring all sample containers are labelled with the patient's unique laboratory accession number as well as the patient name and chart number/ DOB.

6.3 Laboratory Policy on Sample Rejection

The laboratory procedure SLH-LAB-LP-005 Specimen Acceptance, Labelling & Centrifugation outlines the laboratory's rejection policy for request form and samples which are not appropriately labelled. The policy includes directions for handling both replaceable and irreplaceable samples.

Samples may also be rejected for other reasons such as:
Sample instability due to delay in transport; inappropriate container; insufficient sample volume.

Laboratory staffs are acting correctly in refusing to accept a request for testing when either the request form or the sample is inadequately/incorrectly labelled.

The laboratory staff will inform the ward/Dr if a sample is unsuitable /incorrectly labelled and request a new sample. The laboratory will not be responsible should any problems arise due to delays caused by unsuitable/incorrect labelling of samples or forms. All rejected samples are logged in the Laboratory Information System and the reason for the rejection documented.

6.4 Definition of replaceable and irreplaceable samples

Replaceable samples:
Can be re obtained without any significant risk to the patient and whose results are not likely to be different from those obtained initially because of any therapeutic intervention.

a. Among blood and urine samples, all but a few types are considered replaceable. Samples from patients with difficult or inconvenient venous access are considered replaceable unless they meet one of the criteria listed below in irreplaceable samples.
b. All blood samples sent to the Blood Bank for purposes of obtaining material for transfusion are automatically viewed as replaceable; that is, if misidentified or unidentified, they must be redrawn even if they fall under one of the qualities listed below.

Clinically Critical /Irreplaceable samples:
Some samples are considered Clinically Critical / irreplaceable and may be processed provided the unique identity of the sample can be determined and documented. The Specimen Reception Non Conformance Form (SLH-LAB-LF-012) is used to document all irreplaceable samples which are processed despite misidentification. Examples of irreplaceable samples include:

a. Samples obtained by invasive procedures such as surgery biopsies, fluid aspirates, foetal amniotic sampling, and CSF samples.
b. Samples obtained before an intervention that might alter the result (e.g. a sample sent for blood culture where antibiotic therapy was administered before a repeat sample could be obtained).
c. Umbilical cord blood, blood samples from neonates or from infants less than 6 months of age for whom the total blood volume is problematic.

In the instance that Clinically Critical / irreplaceable samples are processed the final report will shall indicate the nature of the problem, and that where applicable caution is required in interpreting result this is outlined in SLH-LAB-LP-013 Procedure for reporting & releasing results.

6.5 Sample Storage Facilities

The laboratory has appropriate facilities for storage of samples to avoid deterioration, loss, or damage during pre examination activities.
Non urgent samples that are received and not processed the same day are stored appropriately until processed.
All other samples are processed on the day of receipt, post processing the following retention times for samples are in place:

- BT The sample is held in the laboratory should crossmatching be required for 72 hours. Samples are subsequently stored for at least 14 days post transfusion.
- Haematology and coagulation specimens are usually kept for 48 hours after final report has been issued.
- Blood films are kept for 2-3 months after final report has been issued.
- Biochemistry specimens are kept for 48 hours after final report has been issued.

6.6 Storage Retention and disposal of Clinical Samples

The laboratory has retention times for clinical samples as follows:

Laboratory Records	**R.C.P Minimum Retention time**	**Laboratory Minimum Retention times**	**Location**
Plasma/Serum	48 hours after final report has been issued.	48 hours after final report has been issued	Haematology storage racks filed in specimen number order. Some plasma/serum samples stored in sample racks in Biochemistry.
Whole Blood Samples for Full Blood Counts	24 hours	48 hours after final report has been issued	Haematology storage racks, filed in specimen number order
Coagulation Samples	24 hours	48 hours after final report has been issued	Haematology storage racks, filed in specimen number order
Blood Films	Seven days after final report	2-3 months after final report has been issued	Filed in date order in boxes on differential bench
Patient Blood samples for	14 Days post Transfusion	A pre-transfusion sample should be	Blood Bank Reagent Refrigerator - filed in

grouping, antibody screening and/or crossmatching		retained for at least 3 days post transfusion. A plasma sample 7-14 days post transfusion for investigation of DHTR at 4^{o}C BCSH guidelines*	specimen number order

All laboratory waste is segregated and disposed of in accordance with the national policies and legislation (see Department of Health Guidelines for the "Segregation, Packing and Storage Guidelines for Healthcare Risk Waste, 2010") as well as the St. Luke's General Hospital Waste Management Plan (SLGH WM 001).

6.7 Additional Examination Requests

Repeat Examination due to Analytical Failure

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

- Repeat the test using a back up instrument/ method
  or
- Store the specimens in appropriate conditions until the cause of the analytical failure is identified and corrected and then repeat the test. The urgency of the outstanding specimens is reviewed by the Consultant Haematologist or nominee.

Further Examination of the Primary Specimen

When further testing is relevant to the investigation or diagnosis of the condition or symptoms which gave rise to the original test request, it is the policy if the laboratory to pursue a diagnosis by performance of additional tests, if available, using the primary specimen.

Requesting Additional Examinations (Verbal Requests)

Users of the laboratory service may request additional examinations on specimens already sent to the laboratory provided that the laboratory has sufficient specimen remaining to perform the additional tests and that the specimen is still of optimal quality to allow the reporting of accurate and meaningful results.

Additional requests may be made verbally over the phone. The medical scientist receiving the call will if necessary consult with senior staff before accepting the request to determine the suitability of the sample for the required test. Verbal requests should be followed up with a written request form, indicating that this is an add on request.

Out of hours add on requests for ESR will only be processed if clinically urgent, otherwise it will be processed during routine hours a written request form is required for these add on tests out of hours to ensure they are processed the following working day.

In blood transfusion all telephoned requests for products are documented on the laboratory form SLH-BT-LF-008.

For blood science requests the additional test is also documented on the laboratory information system.

6.8 Department Guidelines for Requesting Additional Examinations

Department	Policy
Blood Transfusion	Please contact the laboratory for all additional requests such as crossmatching etc. The suitability of the sample for additional requests will be determined at the time of the request. Any additional testing can be requested by phoning the Blood Transfusion Lab at extension 85483. Once a request has been placed for a blood component or product to be issued the medical scientist will ensure that a suitable sample is available in the laboratory. It may be necessary to take a repeat sample from the patient depending on pregnancy or previous transfusion history of the patient. If the patient is suitable for electronic issue, the lab will be able to release red cells immediately following a verbal request. The lab will advise of this at the time of the request. 'Samples for Storage' received mainly from the Maternity/EPAU wards can be processed up to 72 hours after receipt. By phoning the laboratory storage samples can be processed for Group & Save, crossmatching, issue of Anti-D etc.
Haematology	Haematology and coagulation specimens are usually kept for 48 hours after final report has been issued. Blood films are kept for 2-3 months after final report has been issued. Requests for additional testing are dependent on the test being requested. APTT & D-Dimer requests are very time sensitive and are not suitable for analysis more than 4 hours after being taken. A PT test can be processed up to 24 hrs after sampling. For other requests e.g. Infectious Mono, ESR, blood film etc. see the individual tests in haematology section.
General Biochemistry	Routine specimens are retained in the Biochemistry laboratory at room temperature 48 hours after final report has been issued. Analyses of additional tests are subject to specimen integrity and analyte stability. Add on facility only available for routine biochemistry samples up to 24 hrs from sample draw and only if the plasma/serum has been separated from cells and the sample appropriately stored.

7 Reporting of Results

Laboratory reports from St. Lukes General Hospital are issued by laboratory information system and reference ranges for different analytes are printed with the test results.

7.1 Electronic Reports

All in patient reports for all clinical areas are electronic only. Once results from blood sciences are authorised they are available electronically to all clinical areas in SLH and KROH using the Lab Web Enquiry system. Any problem with the ward enquiry should be logged with IT in the first instance.

The requesting clinician is responsible for ensuring that the result is accessed and viewed using the" **Lab Enquiry**" icon 

available on all desk tops. Once the clinician accesses results electronically using his/her unique log on, this is equivalent to an electronic signature.

Blood science reports viewed on the "Lab Web Enquiry" are considered final reports and are issued as electronic only reports for all in patient SLH locations.

Electronic reporting of GP results is in place regionally for GP's who have an electronic link (GPEL) and for AEH via Healthlink.

For Ward Enquiry Access & all queries, please email Lab.systemslk@hse.ie All passwords are issued uniquely to the person requesting access. Passwords must be reset every 100 days prior to expiring & you cannot use a password similar to previous entry. If there are problems with resetting your password email Lab system with details of your username & problem.

Refer to SLH-PATH-LP-013 for guidelines on electronic only reporting.

7.2 Hard Copy Reports

Hard copy of the lab enquiry screen can be printed off if required but do not need to be filed in the patients chart.

All SLH / UHW outpatient reports are sent in hard copy format from the laboratory in SLH to the requesting clinician.

Blood Transfusion reports are sent in hard copy format to the requesting clinical area or consultant if OPD.

Histology results are only available to ward staff that have been given specific access to histology results. Histology reports are printed daily and distributed to the appropriate consultant. St. Luke's Laboratory Medical Scientists and Secretary do not have access to histology results.

7.3 GP Reports: Healthlink

GPs may access their patient results through Healthlink. The Healthlink provides a web-based messaging service, which facilitates the secure transmission of clinical patient information between Hospitals, Health Care Agencies and General Practitioners. Message types include radiology reports, cancer referrals, lab reports & co-op messaging. See http://www.healthlink.ie/

7.4 Telephoned Reports

On occasion the laboratory will phone results when:

- The results fall within established alert or critical intervals, as defined by procedure.
- The result deviates significantly from previous results.
- Urgent action by clinical staff is required.
- It is necessary to notify the requester that testing will be delayed, where it may compromise patient care.
- All INR results from GP's > 4.5 are telephoned daily between 16:00 and 17:00.

The scientist on call is unable to handle telephone calls from GP practices after hours. All GP results can be accessed by electronic link if the surgery has been set up for HealthLink access.

A record is maintained on APEX of actions taken to phone the result, this must include;

- The date & time phoned
- The responsible staff member
- The individual notified

Any difficulties in reporting encountered are recorded on the phone log.

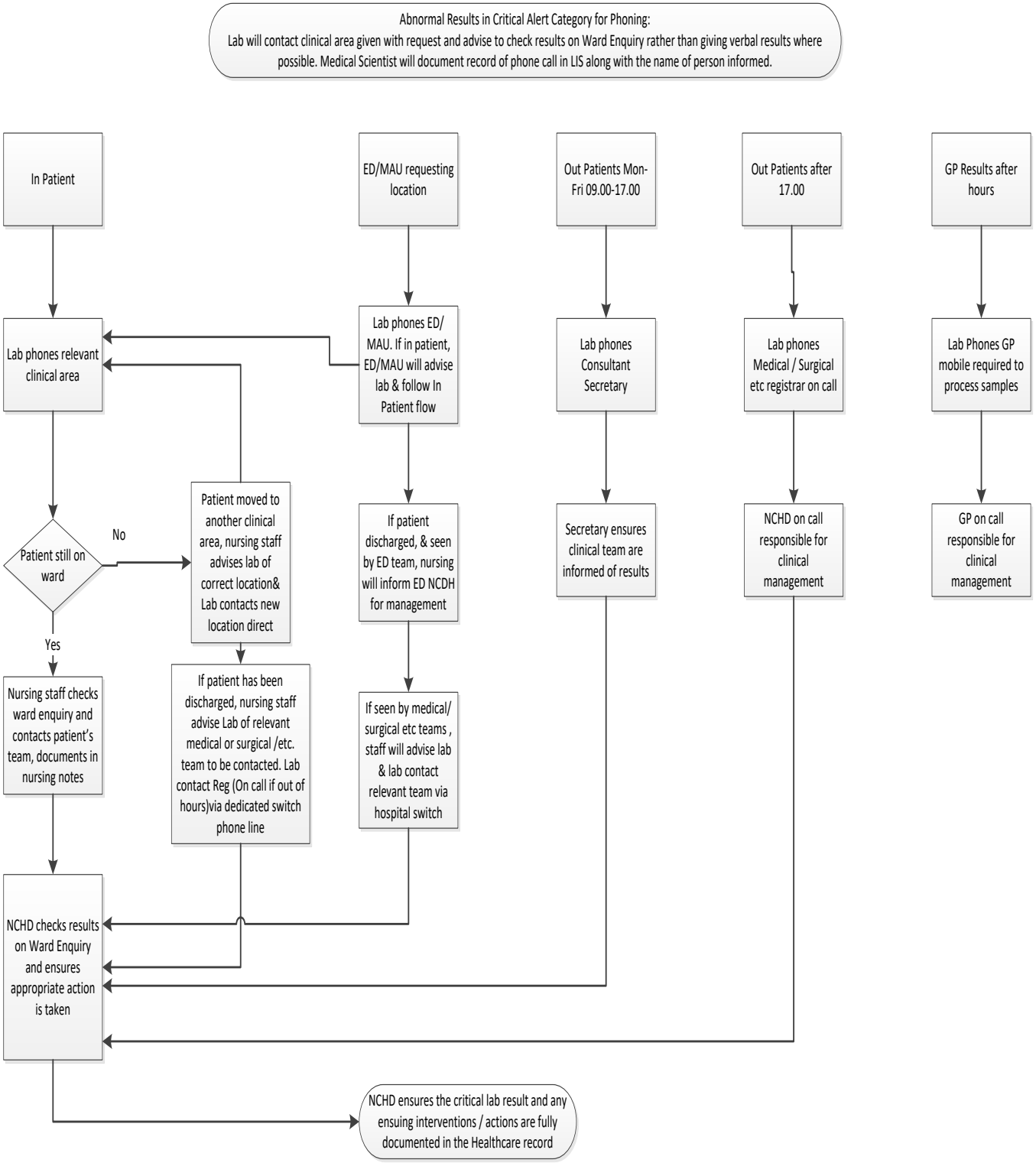
Results delivered by telephone should only be delivered to authorised recipients and should not be communicated directly to the patient.

7.5 Phoning Critically Abnormal Results to GP Out of Hours

Out of hours any critical results need to be communicated whether this is to primary or secondary care areas.
If urgent testing is required up to 5pm this can be processed with a phone call to the laboratory and a GP mobile phone number provided on the request form that can be used to communicate an abnormal result if necessary as outlined above.

Laboratory Protocol for Phoning Abnormal Results Including Clinical Follow Up

(refer to SLGH LAB 001, Protocol for receiving critically abnormal results) :



7.6 Verbal requests for Release of Results

If a verbal request for results is received from requesters the following process must be followed to ensure results reach only authorised recipients.

7.6.1 Request that the clinician sends an email to lab specimen reception requesting results for the patient. SLK.labresults@hse.ie The email should contain;

- Details of the requester
- The patient demographics
- Results required

7.6.2 Once the email is received a PDF printout of the results from APEX is emailed back to the secure email address given. This must be either a Healthmail or secure hospital email address. Results cannot be sent to gmail/ hotmail etc. addresses which are not secure.

***Note: We regret we are unable to deal with result enquiries externally after 17.00hrs.**

7.7 Amended Reports

7.7.1 Where it is discovered that the original report issued is incorrect or contains false information a revised or amended report is issued.

7.7.2 The incorrect results are de-authorised as soon as the error has been identified. The ward / GP are notified immediately and all telephone communications are recorded on the LIS.

7.7.3 The hard copy of report is retrieved if possible or request ward/GP to destroy any relevant printed reports.

7.7.4 The revised report is retained on APEX with a comment indicating that it is an amended report and that it is a deviation from the original.

7.7.5 All amended reports are documented as a non conformance in the QMS (Procedure for Amending Patient Results & Reports SLH-PATH-LP-330).

7.8 Reports from Referral Laboratories

7.8.1 The most frequent external referrals to Eurofins are booked in and reported electronically by an interface with Eurofins. The report clearly identifies that the test was processed externally in Eurofins.

7.8.2 All other blood science requests referred by the lab in SLH are documented as a generic KPOST request on the LIS.

7.8.3 The nature of the request and the referral lab are noted under specimen comment.

7.8.4 When the results are returned to the lab, the original hard copy is sent to the requesting clinician.

7.8.5 The KPOST request is authorised with a comment “Result Returned” and a copy of the referral result is scanned into the laboratory document management software in the event it needs to be retrieved.

7.8.6 All Blood transfusion reports referred from SLH to the Irish Blood Transfusion Service have the original hard copy report returned to the requesting clinician.

7.8.7 The results of referred samples are also entered into the LIS under the patients record, apart from the more complex molecular results which are scanned & original is returned to the requesting clinician.

7.9 Delayed Results

In the event where a delay in examination results could compromise patient care each individual department will communicate this to the clinical area. This should be done by telephoning the clinical area and recording the call on APEX. If the delay is more general, it can be communicated to clinical areas by email/ memo.
Where the issue affects a number of clinical areas/ patients a non-conformance should be raised in the QMS. The call should be recorded as part of the immediate action.

7.10 Uncertainty of Measurement

Certain tests give results as a numerical value. Within this reported value there is an inherent uncertainty, or variability, in the data generated. Data obtained from these tests enable an assessment of this measurement uncertainty (MU). Please contact the laboratory for discussion or values for MU if required.

8 Laboratory Complaints / User Feedback

The laboratory welcomes all suggestions or feedback from patients and users, and aims to continually improve the effectiveness of the management system, including the pre-examination, examination and post-examination processes.

Any feedback or questions on this document should be directed to the following email eimear.croke@hse.ie
The laboratory operates a complaint system (SLH-PATH-LP-301). If the service provided is not satisfactory please contact the Lab Manager or Deputy by phone or email. All complaints are logged, investigated and responded to in a timely manner. The complaints procedure is an integral part of the laboratory quality management system.

9 Patient Confidentiality

All patient data and results are treated as confidential in accordance with HSE Data protection policies and guidelines including the HSE document “Data Protection-Its Everyone’s Responsibility”.

10 Blood Transfusion

10.1 Blood Transfusion Tests

Test/Profile	Container Type(Vol)	Turnaround Times from time of specimen receipt in laboratory **Frequency of Testing**	Special Requirements All specimens must be labelled with Blood Track Label /handwritten with Hospital Number, patient name and date of Birth	Accreditation Status
Group and Screen	EDTA 6ml	24 hrs Urgent 2hrs- Continuous		Accredited
Routine Group and Crossmatch	EDTA 6ml	* Samples before 10:30: Blood Available 14:00 Samples before 15:30: Blood Available 17:00 Samples after 15:30: Ask Lab Staff Continuous	A historical or second blood group sample is required for issue of all group specific crossmatched red cells. Please ensure that all routine crossmatch requests arrived in the Laboratory before the daily cut off time of 15:30. Provide antibody status, if known. Presence of antibodies may lead to difficulty in provision of compatible blood.	Accredited
Electronic Crossmatch	EDTA 6ml	If sampling requirements outlined in section 9. 7 Below are met Blood will be available immediately. Continuous	Two samples collected on two different occasions (i.e. A current sample with an historical ABO and RhD group on record). The historical sample should be taken at a separate phlebotomy and taken at least 10 mins apart. Blood group results on the current sample must be identical to the historic record. The current sample must have a negative antibody screen. The patients' plasma must not contain and not have been known to contain any red cell allo-antibodies.	Accredited
Urgent Crossmatch	EDTA 6ml	*45-60 minutes providing all serological compatibility tests are negative.	Provide antibody status, if known. Presence of antibodies may lead to difficulty in provision of compatible blood.	Accredited

Test/Profile	Container Type(Vol)	Turnaround Times from time of specimen receipt in laboratory **Frequency of Testing**	Special Requirements All specimens must be labelled with Blood Track Label /handwritten with Hospital Number, patient name and date of Birth	Accreditation Status
		40 minutes if current Group and Save sample is available in the lab. Continuous	If suitable for electronic issue, red cells can be issued straight away once the group & screen is ready. Group specific or O Neg red cells are available immediately without a crossmatch if required.	
Group +/- DCT (Cord Blood)	EDTA 6ml	If Received before 15:30: Same Day After 15.30 & On-Call: 14:00 Next Day On Demand		Accredited
Group +/- DCT Paediatric	EDTA	If Received before 15:30: Same Day After 15.30 & On-Call: 14:00 Next Day On Demand		Accredited
Neonatal Crossmatch	EDTA sample from Infant and Mother (6 ml)	Up to 3 hrs (depending on arrival of blood from IBTS) On demand	Provide maternal antibody status, if known. Presence of antibodies may lead to difficulty in provision of compatible blood. Crossmatched against maternal specimen.	Accredited
Transfusion Reaction Investigation	EDTA 6ml	Preliminary 2 hrs Final 7 days On Demand	See Section 9.12 below	Accredited
Antibody Identification	EDTA 6ml	2-5 Days** (depending on complexity) On Demand		Accredited
Phenotype	EDTA 6ml	2-5 Days** (depending on complexity) On Demand		Accredited

*** If delays are unavoidable, e.g. Antibodies present, The medical scientist dealing with the request will inform the team concerned with the patient, and a repeat sample may be requested to either re-test locally or send to IBTS Dublin.**

****Antibody Identification/ Phenotype turnaround time is 72 hours for full authorisation; however the investigation is normally completed sooner bearing in mind the clinical requirements. Authorisation is usually performed by a senior scientist when next on duty**

Occasionally it may be necessary for logistical reasons such as staff shortages etc. to defer testing samples from OPD, Pre Assessment Unit etc, until the following day, once it is clear that the patient is not for surgery the next day.

10.2 Blood Transfusion Referral Tests

Test/Profile	Container Type(Vol)	Turnaround Times from time of specimen receipt in laboratory	Special Requirements All specimens must be handwritten with Hospital Number, patient name and date of Birth	Referral Laboratory	Accreditation Status
Phenotyping /Genotyping	6ml EDTA	1 week On Demand	Samples occasionally sent for Phenotyping when reagents not stocked in SLH	IBTS	Reference Laboratory
Anti D/ Anti-c Quantitation	6ml EDTA x2	1 week	Please provide EDD when requesting Anti-D/-c quantitation.	IBTS	Reference Laboratory
Platelet Alloantibodies	10ml Serum	2 weeks		IBTS	Reference Laboratory
NAITP	Mother: 10ml EDTA 20ml Serum Father: 20ml EDTA Neonate: Discuss with IBTS	2-3 weeks	Clinical Details Essential	IBTS	Reference Laboratory
Foetal Genotyping in Maternal Blood	6 mlx2 EDTA	2-3 weeks		IBTS	Reference Laboratory

10.3 Reference Ranges and Critical Alert Ranges

- The results are abnormal or unexpected
- The result deviates significantly from previous results.
- Grouping discordance
- In the case of a rise in anti-D quantitation that doubles the previous quantitation, and/or reaches an estimated risk level. (i.e. >4 IU).
- In the case of a rise in anti-c quantitation that doubles the previous quantitation, and/or reaches an estimated risk level. (i.e. >7.5 IU).
- Positive DCT on neonate which is not the result of anti-D prophylaxis.

10.4 Cord Blood Testing

Cord Blood samples are required for testing on all Rhesus D Negative women following delivery. Based on the blood group result of the infant, prophylactic Anti-D immunoglobulin may need to be given to the mother.
Cord bloods may also be required where irregular antibodies have been identified in maternal plasma.

A cord blood sample must be labelled with both mother and baby's details (Mothers name & chart number, baby's chart number and DOB) and accompanied with a request form indicating that the sample is cord blood.
A maternal sample and request form for Group & Hold must also be received within 7 days of delivery.

A Blood Group is performed on the baby's cord blood sample. Additional testing on a cord blood may be required in cases where the mother has developed clinically significant red cell antibodies.

10.5 Crossmatch Request

In Addition to the information required in section 4.3, please supply the following information:

- Relevant clinical information, antenatal history, blood transfusion history, transfusion reaction etc., patient diagnosis (special conditions require special blood example sickle cell disease requires special antigen negative blood).
- If specific blood components/products are required i.e. CMV negative, irradiated, this should be requested.
- The specific surgery or reason for a transfusion request should be documented on the transfusion form.
- A clear indication as to whether the tests/components/products requested are **urgent** or **routine**. All urgent requests must be made by contacting the Blood Transfusion department during routine hours or the medical scientist 'on call' at all other times.

Where there is no historical blood group on a patient, and a red cell crossmatch is required a second sample for confirmation of patient blood group is required. This is to help prevent the possibility of an ABO incompatible transfusion.
If suitable, red cells can be released without a full serological crossmatch. The electronic issue of red cells is determined on a sample to sample basis by the lab staff as strict criteria must be met prior to electronic issue.

Where transfusion of the patient has taken place and additional units are required a new group and antibody screen specimen is required 72 hours post transfusion to detect any antibody formation.
Crossmatched blood is issued to a patient and held in the Blood Transfusion Issue fridge for 24 hours from the time the blood is required. The laboratory must be notified if there is a clinical need for blood to be held for longer than 24 hours.

Medical patients requiring transfusion over several days will have their blood kept for 3 days from the start of the transfusion. A repeat HB check should be undertaken prior to transfusion of any subsequent units.

10.6 Second Sample Requirements

The laboratory has implemented a 'Second blood group sample" policy in line with international recommendations.
This is to prevent ABO incompatible transfusion relating to blood sample being taken from an incorrect patient.

A second sample for blood grouping to be taken at a minimum of 10 minutes apart, is requested on all patients with no historical blood group, requiring a crossmatch.
It is important to ensure two samples are **taken independently** of one another to ensure that venepuncture has been performed twice using PPI this process decreases the risk of WBIT.
Please do not take this second sample until advised by the laboratory.

This procedure will not apply to infants requiring top up transfusion with "pedipack" red cells.

10.7 Electronic Issue

Electronic Issue involves the computer verification of ABO and Rh compatibility of donor units with a recipient, based on a current patient sample and a previous concordant historical record. If the criteria below are met and a sample is suitable for EI, it removes the requirement for a serological crossmatch. This reduces the amount of time required to provide crossmatch compatible RCC from 45 minutes to immediate issue.
The following patient and sample criteria must be met in order for a patient to be eligible for electronic issue:

- Two samples collected on two different occasions (i.e. A current sample with an historical ABO and RhD group on record). The historical sample should be taken at a separate phlebotomy and taken at least 10 mins apart.
- Blood group results on the current sample must be identical to the historic record.
- The current sample must have a negative antibody screen. The patients' plasma must not contain and not have been known to contain any red cell allo-antibodies.
- Current sample must have been tested in a fully automated system and results must be electronically transferred to APEX.

10.8 Maximum Surgical Blood Ordering Schedule

A maximum Surgical Blood Ordering Schedule (MSBOS) is a mechanism to maximise usage of blood and minimise wastage in elective surgery. A MSBOS can reduce the workload of unnecessary crossmatching and issuing of blood and optimise stock management. The MSBOS only applies to elective surgery and requires samples being in the BT laboratory at least 24 hours prior to surgery.
For operations / procedures requiring a "Group & Screen" Only the following applies:

- In patients with a negative antibody screen blood can be available within forty minutes if it is required urgently or immediately in cases where the sample is suitable for electronic issue. .
- If a patient has a positive antibody screen detected pre-op then the group & save will automatically transfer to a group & crossmatch**.**

For operations requiring crossmatched blood:

- The designated number of units is reserved for the patient for 24 hours from the proposed date of surgery.

- The blood will automatically be returned after 24 hours unless otherwise requested by the clinical team. If surgery is re-scheduled it is the responsibility of the team to notify the BT lab of the new date for surgery.

In all cases should blood be required urgently then 4 units of emergency O Rh D Negative blood are available in the issue fridge at all times.

The current MSBOS has been constructed by the Blood Transfusion Department in consultation with the Departments of Surgery/ Anaesthetics/ and Obstetrics/ Gynaecology and issued via the Hospital Transfusion Committee.

Orthopaedic Surgery	
Removal hip pin or femoral nail	G&S
Bone graft	G&S
Revision of Hip Prosthesis/Shoulder DePuy ASRs Knee Revisions	2 2 G&S
General Surgery	
Laparoscopic Cholecystectomy	G&S
Laparoscopic Colectomy	2
Cholecystectomy and exploration of common bile duct	G&S
Laparotomy , colectomy, hemicolectomy -Gastrostomy, ileostomy, colostomy	G&S
Liver Biopsy	G&S
Oesophageal Dilation – endoscopic	G&S
Partial Gastrectomy – total	2
Varicose Vein Removal	G&S
Tracheostomy	G&S
Obstetrics & Gynaecology	
LSCS	G&S
ERPC/D&C/TOT MROP	G&S 2
Hydatidform mole	2
Placenta Praevia	3
Hysterectomy – abdominal or vaginal: Simple Extended	G&S 2
Myomectomy	2
Radiology Intervention	
Various Interventions including CT guided biopsy, abdominal drainage, Portcath/Hickman line insertion	G&S

10.9 Available Blood Product /Components / Major Haemorrhage Packs

Product	General Description	Volume	Storage Temp	Shelf life	Storage outside of controlled environment/after preparation	Compatibility Testing Requirement
Red Cells (additive solution) Leucocyte depleted	Red cell suspension obtained from whole blood	280mls ±60 ml	2 - 6°C	35 days	4 hours to complete transfusion from time of removal from Issue fridge.	Yes- to be compatible with recipient ABO & RhD type
Platelet concentrate (Pooled/ Apheresis)§	Platelet preparation from pooling of 5 single donor units or single apheresis donor	>300ml per pooled unit >160ml per apheresis prep.	22±2°C	5-7 days under gentle agitation	Immediate use i.e. less than 20 minutes	Preferably ABO identical with recipient group, depending on availability.
Human Pooled Plasma	LG Octaplas pooled plasma, solvent detergent treated	200ml	≤ 18°C	4 years -frozen	Immediate use preferable, must be used within 5 days, when stored at 2-6°C	Preferably ABO identical with recipient group
Human Fibrinogen§	Riastap freeze dried powder for re-constitution	50ml when re-constituted	2-8ºC	Do not use after expiry date	Immediate use preferable – Refer to product insert for reconstitution	None
Human Albumin (Flexbumin)	Pooled donor plasma	50g/L 250ml (5g)or 200g/L 100ml (20g)	2-25°C	3 years	Immediate Use	None
Anti-D Immunoglobulin	Ready to use IM concentrate of anti-D Ig produced from human plasma	1500 IU per IM injection	2-8°C	Do not use after expiry date	Solution to be used immediately after preparation	G&S sample <7 days required. Only for RhD Negative females when clinically indicated
Human Prothrombin Complex (Octaplex) §	Contains human Vitamin K dependant factors II, VII, IX, X, Proteins C & S, freeze dried for reconstitution	Contact the Haematology team	2-8C	Do not use after expiry date	Octaplex is to be used immediately after reconstitution and on one occasion only	None

Clotting Factor Concentrates§	Freeze-dried human or recombinant factor concentrates	Contact the Haematology team	2-8°C	Do not use after expiry date	Immediate use preferable – Refer to product insert for reconstitution	None
Praxbind§	Ready for use 2 x 50ml- Supplied to lab for via Pharmacy	Contact the Haematology team	2-8°C	Do not use after expiry date	Immediate use preferable – Refer to product insert for reconstitution	None
Ondexxya§	5000iu or 9000iu ready for use doses Supplied to lab via Pharmacy	Contact the Haematology team	2-8°C	Do not use after expiry date	Immediate use preferable – Refer to product insert for reconstitution	None
Points to Note: Administration	• **Record transfusion of each component/product in the Blood Component and Product Transfusion Record, SLH-BT-HF-001.** • **Follow the Blood Transfusion Users Manual available on each clinical area for ordering and administering blood components.** • **For special blood product requirements i.e. irradiated, washed or reconstituted products, the shelf life may be shortened. Contact the laboratory for further information** § Consultant Haematologist approval required prior to use.					

Major Haemorrhage Pack 1

- 4 units RCC (may contain emergency O neg units)
- 2 units of plasma (Octaplas LG)
- 1 adult therapeutic dose of platelets ordered from IBTS (approx 2 hours)
- 2g fibrinogen if derived fibrinogen is low (for obstetric cases also give 2g). Derived fibrinogen level available from laboratory
- IV 1g Tranexamic Acid for all major haemorrhages with 2g in Obstetric cases: Available from Pharmacy

Major Haemorrhage Pack 2

- 4 units RCC (group specific or crossmatched)
- 4 units of plasma (Octaplas LG)
- 1 adult therapeutic dose of platelets ordered from IBTS irrespective of platelet count
- 2g fibrinogen if derived fibrinogen is low(for obstetric cases give 2g)

10.10 Specialised Blood / Blood Products

These recommendations aim to ensure that specialised products, which are a limited resource, are available to the patients who derive most benefit from them.

10.10.1 Cytomegalovirus (CMV)

Cytomegalovirus is a significant cause of mortality and morbidity in immunocompromised patients: -

Indications for CMV Negative Blood Products in SLH

- All Pregnant Women
- All Children <1Year
- All children with malignancies or immunodeficiency's having shared care with Our Lady's Hospital, Crumlin
- CMV negative patients in the following categories are at risk of CMV disease but remember where CMV status is unknown assume the patient is CMV negative:
- Bone Marrow / Stem cell transplant (SCT) recipients.
- Solid Organ recipients
- Kidney transplant patients from the time of transplant if negative
- Liver transplant patients from the time of transplant if negative

N.B All "pedi-pack"blood is CMV-negative and also plasma-reduced blood for exchange transfusion is CMV negative.

10.10.2 Irradiated Blood Products

Graft Versus Host Disease is prevented by irradiation of cellular blood products. Irradiation prevents donor lymphocytes proliferation thus preventing TA-GVHD.

Indication of Irradiated Blood Products at SLH

- Paediatrics

- Congenital immunodeficiency states
- All children with malignancies or immunodeficiency's having shared care with Our Lady's Hospital, Crumlin.

- Haematological Malignancies
  - Hodgkin's Disease
  - Patients who have received Purine analogues or anti-T cell monoclonal antibody therapies e.g. Fludarabine, Cladribine, Deoxycoformicin, Campath, Anti-lymphocyte globulin
  - All platelets now issued from IBTS are routinely irradiated whether required for the individual patient or not.

- HLA Matched Platelets
  - Used in cases of platelet refractoriness – additional testing required for provision of HLA matched platelets.

10.11 Urgent /Emergency Issue of Blood/ Blood Component

In a non obstetric emergency situation follow the "Clinical protocol for Management of non- obstetric Acute massive blood loss" SLH-PATH-CP-004. For Obstetric bleeds refer to SLGH MID 004 (SLH-CP-006).

Urgent and Emergency sample processing in Blood Transfusion must be accompanied by a telephone call to the laboratory or medical scientist on duty explaining the urgency of the situation.
The emergency phone extension for Blood Transfusion is 85798 during routine hours/ Contact on-call medical scientist on 17296.

There are four units of O Rh D Negative - uncrossmatched blood (RCC) in the Blood Bank Issue Fridge for use in emergencies **for adult patients**.
There is a fresh < 5 days old CPDA O Rh D Negative RCC unit available in Blood Bank Issue Fridge for use in emergency **for neonates** when it is available from the NBC.
These can be issued by the medical scientist in an emergency situation.
When a patient blood group becomes available, group specific blood will be issued.
Note *The emergency neonatal unit is not suitable for transfusion to a neonate where maternal Anti-c is present.
In emergency situation personnel in the Blood Transfusion laboratory have 4 options depending on the urgency of the situation

1. Issue units of O Rh negative blood immediately.
2. Perform a quick ABO and Rh type on the patient specimen. Laboratory will then issue ABO Rh compatible blood. (approx.10-15 mins)
3. Issue red cells electronically immediately if the patient / sample meets the required criteria.
4. Perform complete pre-transfusion cross-matching testing which will take approximately 60 minutes.

The necessary traceability records must be created retrospectively. The traceability label must be completed and signed at administration and returned to the laboratory

as proof of transfusion. This is a mandatory legal requirement, alternatively use Blood Track for recording administration.

It is a Medical Decision to Transfuse Uncrossmatched Red Cells.

Refer to "A Guideline for the use of Blood and Blood Components in the Management of Massive Haemorrhage" issued by the National Blood Users Group, Nov. 2002. Refer to
Other Recommended Websites:
www.transfusionguidelines.org.uk
www.bcshguidelines.com

10.12 Storage of Blood / Blood Components for Collection

Blood/Blood Component	Storage Area
Red Cells & Plasma	Blood Bank Issue Fridge
Albumin	
Platelets	Platelet Agitator in the Laboratory
Fibrinogen/ Coagulation Factors	Blood Bank Issue Fridge
Anti-D	Blood Bank Issue Fridge

Blood component/products should only be collected from the Transfusion Laboratory by trained individuals. Access to the issue fridge in the Blood Transfusion Department is controlled by means of the staff electronic swipe card.

10.13 Collection of Blood / Blood Components from the Laboratory

Prior to collection of any blood component/product, patient details and the blood component/ product required must be filled out on 'Blood Collection & Traceability' form (SLH-BT-HF-002 Aut Even, 003 St. Luke's, 005 St. Luke's Massive Transfusion. 011 Kilcreene as required).

A suitable transport container must be used to bring the blood component/product to the ward, i.e. 'Blood Transport box or MT4 Box (Resus or theatre usually).

All blood components/products must either be scanned out using the Electronic Blood Track System – kiosk beside the Blood Bank Issue fridge or signed out in the Blood Bank Sign Out log (SLH-BT-LF-010) which is beside the Blood Bank Issue fridge before being taken to the ward.

Red cells and platelets are scanned out using the Blood Track Kiosk and all batch products are signed out using the Blood Bank Sign-Out log. The 'Blood Collection & Traceability' form must also be signed and returned to the ward with the blood component/product.

The blood & form must be handed directly to nursing staff, who must then sign for the receipt of the blood component/product.

Avoid delays as components/products taken should be transfused as soon as practicably possible.

If any blood component/product has to be returned to the laboratory/fridge, the laboratory must be contacted both during routine and on-call hours and signed back in with time, date and patient details.
Red cells that have been out of the fridge for > 30 minutes cannot be returned to the fridge.

Collection of Blood for Kilcreene Orthopaedic Hospital is described in the procedure Collection of Blood/Blood Products in SLGH/KROH/UPMC AEH, SLH-BT-HP-011.

10.14 Transfusion Reaction Investigation

Refer to the 'Administration of Blood Components and Products' procedure, SLH-BT-HP-005 available at St Luke's Hospital Kilkenny - HSENet Document Hub (healthservice.ie)
On discovery of a suspected transfusion reaction:

- Stop transfusion of blood product immediately where a suspected reaction has occurred and verify Patient ID, ABO group of patient and donor unit immediately.
- Medical advice should be sought immediately from the patient's team and/or the haematology team.
- Contact the Blood Transfusion laboratory during both routine and on-call hours.
- Contact the Haemovigilance CNS during routine hours.
- Record the reaction on blood track if used.

All implicated blood/product packs with giving set attached must be returned to the Blood Transfusion laboratory with the relevant specimens and the 'Report of Transfusion Reaction' form (SLH-BT-HF-007) on the reverse of the Blood Component and Product Transfusion Record (SLH-BT-HF-001).

Transfusion Reaction Investigation Test/Profiles	**Container (Vol)**	**Special Requirements Take all samples post suspected Transfusion reaction.**	**Accreditation Status**
Type/Screen	6ml EDTA	Use Blood track to label or hand write	Accredited
FBC	EDTA 5ml		Accredited
COAG	Citrate 3.0ml		Accredited
UE, LFT's, LDH	4ml Clotted/ Lithium Heparin.		Not Accredited
Haptoglobins	4ml Clotted		Referred to UHW
MSU (Urobilinogen)	MSU Container	1st voided urine	Test at point of care
Blood Cultures Adult	aerobic and anaerobic vials		Referred to UHW

Blood Cultures Baby	Paeds yellow bottle		Referred to UHW
All Blood Packs including giving sets (used and unused)		Send to lab SLH for inoculation	Referred to UHW

All suspected reactions reported will be fully investigated by the Haemovigilance CNS and reviewed by Consultant Haematologist. It is a mandatory requirement (EU Directive 2002/98/EC) for all Serious Adverse Reactions (SAR) and Serious Adverse Events (SAE) which fit criteria to be reported to the National Haemovigilance Office (NHO).

10.15 Traceability

Article 14 of the Blood Directive 2002/98/EC mandates full traceability of all blood components.

Collection and Traceability forms must be used when collecting any blood component or product from the laboratory.

When pre-transfusion checking procedure is completed and the component/product is connected to the patient, the peelable section of the Traceability label containing the donor number is removed from the product and placed in the observation section of the prescription.

The 2nd (detachable) section of the traceability label is removed from the pack, signed dated and timed by the person commencing/witnessing the transfusion. The part of the label is then placed on the Blood Collection and Traceability form. The form is then placed in the Collection and Traceability box on the clinical area.

These procedures are described fully in the Blood Transfusion Users Manual available on all clinical areas.
SLH & KROH have moved fully to the use of Blood track wherever possible. This allows for the electronic recording of red cell and platelet transfusions. If using Blood Track, it can record the start and end of transfusion and the fate of the unit is automatically updated to the laboratory LIS. At the moment, the traceability label continues to be returned in addition to the use of Blood Track.

10.16 Major Haemorrhage Plan

For details on Transfusion Management of Major Haemorrhage in SLGH
See clinical protocol SLH-PATH-CP-004. The flow chart for Management of Non-Obstetric Acute Massive Blood Loss is located in appendix II of this manual.

11 Haematology

11.1 Haematology Tests

Test/Profile	Adult: Cap Additive (Vol)	Paediatric: Cap Additive (Vol)	Frequency Of Testing\ Turnaround Times	Special Requirements	Accreditation Status
Full Blood Count	EDTA 2.5ml	EDTA 1.3ml	**Urgent** 1 Hour **Routine** 4 Hours	FBC should be less than 24 hrs old at time of testing	Accredited
Blood Film	EDTA 2.5ml	EDTA 1.3ml	**Urgent** Contact Lab to Arrange **Routine** 72 Hours	Blood film should be made from fresh FBC sample by the lab staff.	Accredited
ESR	EDTA 2.5ml		**Urgent** Contact Lab to Arrange 2 hours **Routine** Request dependant on clinical criteria	Clinical criteria for ESR are: Temporal Arthritis Connective Tissue Disease Otherwise CRP is preferred test.	Not Accredited
Infectious Mononucleosis	EDTA 2.5ml or Serum 1ml		**Urgent** 2 hours **Routine** 24 Hours	Not available on call	Accredited
Haemoglobinopathy Screen	EDTA 2.5ml or Serum 1ml	EDTA 1.3ml	2 Weeks	Samples are sent to St.James's / Crumlin	Not Accredited
Coagulation (Do not take samples from heparin containing IV lines)					
˜Coagulation Screen (PT,INR,APTT)	˜Sodium Citrate 3.0ml	˜Sodium Citrate 1.3ml	**Urgent** 1 Hour **Routine** 4 Hours	Specimens are: Tested on day of collection. GP samples must be in lab before 15:00 hrs Non-urgent samples stored over night. APTT must be tested within 4hrs	Accredited
Fibrinogen	3ml blood Sodium Citrate (blue top)		See Above	A derived fibrinogen screen test is available in SLH on request.	Not Accredited

Test/Profile	Adult: Cap Additive (Vol)	Paediatric: Cap Additive (Vol)	Frequency Of Testing\ Turnaround Times	Special Requirements	Accreditation Status
Thrombophilia Screen (includes PC, PS, ATIII, APCR resistance and Lupus anticoagulant screen)	6x 3ml blood Sodium Citrate (blue top)		4-6 Weeks	Use SLH request form **alert lab**. Samples sent to UHW for testing. **Indications for Thrombophilia screening must meet regional guidelines or the samples will not be processed.**	Referred to UHW Use UHW Request form. (Form-PATH-HAEM-39)
Factor Assays	6x 3ml blood Sodium Citrate (blue top)		Routine: 4-6 weeks Urgent: Same day	Use SLH request form **alert lab**. Samples sent to St.James's for testing. **Indications for factor assays screening must meet regional guidelines or the samples will not be processed.**	Referred to Special Coagulation in St.James's http://www.stjames.ie/Departments/DepartmentsA-Z/C/CoagulationLaboratory/DepartmentOverview/
D-Dimers	3mls blood Sodium Citrate (blue top)		**Urgent** 1 Hour **Routine** 4 Hours	Suitable for testing up to 4 hrs. Interpret results with caution for D Dimers that were tested when time of sampling was unclear/ not documented.	Accredited

11.2 D-Dimer Testing

Please refer to the DVT pathway for the management of patients with suspected DVT. DVT pathway which is available in ED and MAU and outlines that D Dimer will be restricted to DVT/PE/DIC only and will require prior assessment of Wells score. The Wells score must be filled in on the request form in order to allow processing of specimen.
Refer to the age related cut of values for interpretation of results.

11.3 Special Coagulation

Samples for special coagulation are frozen, sent to UHW and subsequently done in batch in the Haematology Lab, UHW.
More unusual coagulation assays are dispatched frozen to the special coagulation Laboratory in St. James Hospital, Dublin.

If required urgently in a particular clinical case please discuss with the laboratory and/or Consultant Haematologist who will advise on guidelines for Thrombophilia screening etc.
It is essential that all tubes be filled accurately to the marked line on the bottle.
Please contact the laboratory for advice if any other clotting assay is required which is not listed below.

11.4 Blood Films

11.4.1 Out of Routine Hours

Scientists 'On-Call' prepare films for review. They are trained to recognise platelet clumping.
All other urgent film review 'Out of Hours' is referred to Consultant Haematologist. See section 1.8 for advisory services and contact details.
The requesting Consultant discusses the case with the Consultant Haematologist on-call, and the blood films are referred on request to the named Consultant.

11.4.2 Blood films for Consultant review

Grossly abnormal results i.e. presence of blasts in new patient less than 70 years are treated as urgent and reviewed by Consultant Haematologist immediately.
Less urgent films i.e. ITP, suspected CLLs etc. are referred to Consultant Haematologist on next routine working day.

If the Medical Scientist deems that a non-urgent film requires review in UHW, they are referred for further comment.
Grossly abnormal films referred to UHW are reported on the same day with all other films reported within 7 days.

11.4.3 UHW Blood Film Review

In the absence of a medical scientist trained for blood film morphology for a period of greater than 5 routine working days, all films are referred to UHW for review.
Urgent films will continue to be sent as described above.

11.5 Reference Ranges

Please note that all reference ranges stated on in Haematology reports do not take into account pregnancy status or gestational age at birth. Please use clinical interpretation in such instances

11.6 Critical Alert Ranges

Parameter	Phone List Limit
Haemoglobin	<7.0 g/dl
Haematocrit	>0.60
WCC	>30 x10^9/L
Ensure all new leukaemia's, Pancytopenias and Erythroblastic blood pictures are phoned	
Neutrophils	<0.5 x 10^9/L
Platelets	<30 x 10^9/L

	>1000 x 10^9/L
INR	> 4.5
APTT	>70 secs
D Dimer	>7650 FEU

12 Biochemistry

12.1 Biochemistry Tests

12.2 All tests for routine biochemistry should be written on one request form

Test/Profile	Adult: Cap Additive	Paediatric: Cap Additive (Vol)	Comments.	Frequency of Assay
Acetomeniphine (Paracetamol)	4ml Clotted/ Lithium Heparin	Heparin 1.3ml	Sample should be tested at least 4 hours post ingestion.	On Demand
Alanine Amino Transferase (ALT)	4ml Clotted/ Lithium Heparin	Heparin 1.3ml	Part of LFT	Continuous – however routine specimen should be received before 19.00 hrs.
Albumin	4ml Clotted/ Lithium Heparin	Heparin 1.3ml	Part of LFT,	Continuous – however routine specimen should be received before 19.00 hrs.
Alcohol	4ml Floride Oxylate	4ml Floride Oxylate	Result cannot be used for medico-legal purposes	On Demand
Alkaline Phosphatase	4ml Clotted/ Lithium Heparin	Heparin 1.3ml	Part of LFT,	Continuous – however routine specimen should be received before 19.00 hrs.
Amylase	4ml Clotted/ Lithium Heparin	Heparin 1.3ml		Continuous – however routine specimen should be received before 19.00 hrs.
Aspartate amino-transferase (AST)	4ml Clotted/ Lithium Heparin	Heparin 1.3ml	Must be requested specifically.	Continuous – however routine specimen should be received before 19.00 hrs.
Bilirubin	4ml Clotted /Lithium Heparin	Heparin 1.3ml	Part of LFT,	Continuous – however routine specimen should be received before 19.00 hrs.

Test/Profile	Adult: Cap Additive	Paediatric: Cap Additive (Vol)	Comments.	Frequency of Assay
BNP	2.5ml EDTA		Separate sample required, only for diagnosis of heart failure and restricted test due to expense	On Demand, Use BNP request form & indicate reason for request. Only 1 BNP test per admission. Serial BNP not indicated.
Calcium	4ml Clotted/ Lithium Heparin.	Heparin 1.3ml		Continuous – however routine specimen should be received before 19.00 hrs.
Cardiac profile Troponin CPK	4ml Clotted (CPK) & 2.5 ml EDTA (TNI)	Heparin 1.3ml	Second timed sample should be 3- 6 hours after the initial sample. Thereafter use CPK only to monitor	Continuous – however routine specimen should be received before 19.00 hrs.
CPK	4ml Clotted/ Lithium Heparin	Heparin 1.3ml		Continuous – however routine specimen should be received before 19.00 hrs.
Creatinine	4ml Clotted/ Lithium Heparin	Heparin 1.3ml	Part of renal profile	Continuous – however routine specimen should be received before 19.00 hrs.
CRP	4ml Clotted or Li Heparin sample	Heparin 1.3ml		Continuous – however routine specimen should be received before 19.00
Direct Bilirubin	1ml Li Heparin /Clotted	Heparin 1.3ml	Indicate on request form if direct bilirubin is required.	Continuous – however routine specimen should be received before 19.00 hrs.
Blood Gas pH pCO_2 pO_2 HCO_3 O_2 Saturation Base Excess Carboxy-haemoglobin Methaemoglobin	1ml Arterial / venous/capillary	1ml Arterial / venous/capillary	Point of Care test only. Not available in the laboratory.	On Demand

Test/Profile	Adult: Cap Additive	Paediatric: Cap Additive (Vol)	Comments.	Frequency of Assay
Electrolytes **Sodium** **Potassium** **Chloride**	4ml Clotted/ Lithium Heparin	Heparin 1.3ml	Specimen should be received in lab **within 4 hours**. Values may be altered if serum left un-separated from cells.	Continuous – however routine specimen should be received before 19.00 hrs.
Glucose	Fluoride oxalate plasma.	Fluoride oxalate plasma.		Continuous – however routine specimen should be received before 19.00 hrs.
HCG	4ml Clotted/ Lithium Heparin	1.3ml Clotted		Continuous – however routine specimen should be received before 19.00 hrs.
ICU Profile	4ml Clotted/ Lithium Heparin	Heparin 1.3ml	Biochemistry tests automatically include UE, LFT, Ca, PO4, Mg CRP	On Demand
Liver profile ALT Bilirubin (total) ALP Total Protein Albumin GGT	4ml Clotted/ Lithium Heparin	Heparin 1.3ml	ALP reference range is age linked.	Continuous – however routine specimen should be received before 19.00 hrs.
Lactate	Fluoride oxalate plasma.	Fluoride oxalate plasma.	Should be sent to lab without delay	Lactate can only be tested on fresh samples (no add-ons) the sample needs to be spun within 15 minutes of sampling as per supplier. Lactates are only performed to confirm high lactate results from point of care devices
Magnesium	4ml Clotted/ Lithium Heparin	Heparin 1.3ml		Continuous – however routine specimen should be received before 19.00 hrs.
PET Profile	4ml Clotted/ Lithium Heparin	Heparin 1.3ml	UE, LFT, CA, LDH, Uric Acid, AST (include FBC)	On Demand
Potassium	4ml Clotted/ Lithium Heparin	Heparin 1.3ml	Sample must be received in lab **within 4 hours** of collection	Continuous – however routine specimen should be

Test/Profile	Adult: Cap Additive	Paediatric: Cap Additive (Vol)	Comments.	Frequency of Assay
			or sample must be separated.	received before 19.00 hrs.
Procalcitonin	4ml Clotted Sample	1.3ml Clotted	Test should only be requested by Consultant	Once a day in pm batch
Renal profile Urea Sodium Potassium Chloride Creatinine	4ml Clotted/ Lithium Heparin	Heparin 1.3ml	Bring to laboratory as soon as possible – **within four hours.** Altered levels of electrolytes can occur if separation is delayed.	Continuous – however routine specimen should be received before 19.00 hrs.
Troponin	2.5ml EDTA	EDTA 1.3ml	Separate sample required-cannot process FBC & TNI on the same sample.	On Demand
Urea	4ml Clotted/ Lithium Heparin	Heparin 1.3ml	See renal profile	Continuous – however routine specimen should be received before 19.00 hrs.
Urea/Electrolytes	4ml Clotted/ Lithium Heparin	Heparin 1.3ml	See renal profile	Continuous – however routine specimen should be received before 19.00 hrs.

12.3 Turnaround Times

Status /Location	TAT
Routine in-house biochemistry	4 Hours
MAU/A&E/ICU biochemistry	1 Hour
Critically urgent samples	Phone call to 85371

12.4 Urgent Specimens

Samples from Accident & Emergency Department, MAU and ICU, CCU/SCBU and Oncology in St. Lukes General Hospital are automatically treated as urgent samples. These samples are given priority.

If there is an emergency request from other areas, the laboratory should be telephoned and the specimen request form clearly marked as **urgent** so that it can be easily identified.

Outside normal working hours, on call staff must be contacted via the switchboard.

12.5 Referral Specimens

12.5.1 Tests for UHW Biochemistry

For primary sample requirements on examinations that are referred to UHW check the UHW user manual:
http://www.hse.ie/eng/services/list/3/hospitals/waterford/
Under Departments Click on Laboratory Services then in the test library search all tests from A-Z by name for all required information.

Dispatch Times to UHW	Comments
Monday-Friday 08:00 11:00	All routine Samples
After Routine Dispatch times	For Urgent Samples contact Lab to arrange
Weekends & Bank Holidays 09.30am	All routine Samples

Therapeutic drug levels / urgent samples MUST be received in UHW by:

- 16:00hr Monday to Friday
- 12:00hr at the weekend.

If samples need to be processed after these times, the lab must be contacted to arrange transport.

12.5.2 Tests not done in SLH / UHW

Many tests are referred to Eurofins Laboratories or other public labs if testing is centralised nationally, such as genetics etc.
For primary sample requirements on examinations sent refer to Biomnis website:
http://www.eurofins.ie
Select Test Information then Test Guide, now select the department and then the actual examination that you require for all required information on sample collection.

All samples referred out by the lab in St. Lukes General Hospital are either captured on the system as a KPOST request which records details of the test requested and where it was sent, or with the actual code for the tests. If using the actual code, then the results will be available on Lab web Enquiry as they are transmitted from the referral lab electronically.

Due to the expense of some external tests, it may be necessary to restrict ordering of such tests to a Consultant only.

Please note

- If the test requested is not processed in-house but is sent to UHW, please send a separate sample and request form.

- **It is essential that any specialised test requiring special handling e.g. freezing prior to dispatch is sent on a St. Lukes Laboratory request form and the lab is informed that the sample is being taken. Please ensure that the sample is then handed directly to laboratory staff.**
- Failure to do so may result in the sample being missed and therefore unsuitable.

12.6 Hypoglycaemic Workup / Metabolic Work up Request Forms

All samples sent for Hypoglycaemic (Newcastle screen) /Metabolic work up must be accompanied by either "SLH Hypoglycaemic Work up Request form" SLH-BIO-LF-017 or "CHI Metabolic Request form" LF-META-0108 (SLH-PATH-LIB-160) these forms give details of samples required and also includes space for essential clinical details. Samples are referred to Biochemistry in Temple Street / Eurofins and will not be processed by referral lab without clinical details attached.
Metabolic work up forms available on Paediatric ward, please contact lab for Hypoglycaemic (Newcastle screen) work up form.
Note: if the only clinical details are Autism/ASD then the metabolic request must be sent to Eurofins as CHI cannot process them.

12.7 Reference Ranges

Please note that all reference ranges stated in biochemistry reports do not take into account pregnancy status or gestational age at birth. Please use clinical interpretation in such instances

12.8 Critical Alert Ranges

Below is a list of action limits for contacting medical practitioners and wards with urgent abnormal results. These limits are based on the first abnormal set of results or repeat results that have shown a markedly significant change for an individual patient.

Action Limits			
Analyte (serum/Plasma)	**Unit**	**Below**	**Above**
Sodium	mmol/L	120	150***
Potassium	mmol/L	2.5	5.8**
Urea	mmol/L	None	30****
Creatinine	umol/L	None	300*
Glucose	mmol/L	2.5	20
Calcium	mmol/L	1.8	3.0
Magnesium	mmol/L	0.4	1.8
Phosphate	mmol/L	0.3	
AST	U/L	None	800
ALT	U/L	None	800
CPK	U/L	None	500

Amylase	U/L	None	500
TnI	Ug/L	None	>0.2
CRP	mg/L	None	>300
Alcohol	Mg/L	None	>400
D Bili	Umol/L	None	25
Lactate	mmol/L	None	4.0
Urate	Umol/L	None	340

- *>200 if < 16yrs
- ** >6.0 if GP
- *** <130 if <16yrs
- **** >10 if <16yrs
- Urate is for ante natal only

13 Microbiology

13.1 Microbiology Tests

Test/Profile	Type of Sample		Comments.	Frequency of Assay
SARS-CoV-2 Assay (Flu A/B & RSV during winter months also available)	Nasopharyngeal and /or Oropharyngeal swabs		Swabs should be collected in universal transport medium. If a sample is seen to be leaking on receipt, it cannot be processed	Assay for SARS-CoV-2 is run in batches throughout the day from 9am-9pm Mon-Fri/ / 9am-4pm Saturday/ Sunday/ Public Holidays
Test/Profile	**Adult: Sample Requirements**	**Paediatric: Sample Requirements**	**Comments**	**Frequency of Assay**
Blood Culture	2 Blood culture vials Aerobic (Grey Label) & Anaerobic BACTEC bottle (Purple label) 8-10ml of Blood transferred equally between vials/ if less than 10mls transfer larger volume into aerobic vial and remainder into anaerobic vial.	1-3 ml of blood in a Paediatric blood Culture vial(Pink Label).	Include site taken, on request form. In suspected endocarditis, two sets of blood cultures should be taken from separate venepuncture sites Barcode labels must be left on the on the bottle when taking sample	Daily

13.2 Blood Culture Turnaround Times

Gram stains within 2 hours of turning positive on the Bactec. Negative reports available after 36hrs incubation for paediatric and 48hrs for adults.
Ongoing culture for 5 days days (7 days for suspected Bacterial endocarditis (BE), Infective Endocarditis (IE), Subacute bacterial endocarditis (SBE), cardiac vegetation, prosthetic valves in situ & Brucella cases) with further reports if positive after initial 36/48hrs. Identification and susceptibility within 2 days of growth.

13.3 Blood Culture Specimen Requirements

The optimal time for collection is before antimicrobial therapy and as soon as possible after a spike of fever. Blood cultures should be transported to the laboratory within 4 hours of collection, for loading to the blood culture system. Where there is a delay in transport to the laboratory or loading onto the blood culture system, blood cultures MUST NOT be refrigerated.

13.4 Clinical Information

Positive Blood Cultures are sent to UHW for analysis. Clinical governance of Blood Cultures is solely the responsibility of UHW. All positive blood cultures go to the Microbiology lab in UHW for further testing and reporting.

13.5 SARS-CoV-2 Assay Result Interpretation

A not detected result, although a negative result was obtained, the laboratory findings in this case suggest that a repeat specimen should be considered, if COVID is clinically suspected. This result should NOT be assumed to rule out COVID in this case.

A weak positive comment is entered on all Detected results where the CT count is >30. Here a repeat samples is suggested in 24-48 hours.

13.6 Critical Alert Ranges

All positive gram stains/isolates are phoned to the requesting clinicians. Gram stains phoned within 2 hours of turning positive on the Bactec.

All SARS-CoV-2 Assays with a detected result are phoned and emailed to clinical area and relevant staff once result is available.

14 Revision and Audit

Documents can be reviewed at any time if necessary

All documents must be reviewed at least every two years.

Compliance with this procedure will be checked regularly and reviewed if necessary.

15 Revision History

Date	Review Number	Section Number	Change/s
04-2016	10	All	Updated to PPPG Format
		3.10	Addition of section 3.10
		4	Labelling of Blood Transfusion Samples
		4.2 / 11.2	New Request forms for Metabolic / Hypoglycaemic work up's- Paediatric ward only
		5.4	Irreplaceable Samples
		5.6	Out of hours add on requests for ESR/Monospot
		6.5	Addition of process flow
		6.6	Changed section 6.6
		6.10	Uncertainty of Measurement
		All	Standardized examinations offered tables in each section

			Addition of section 9.6 / 10.3.1
11-2017	11	10.1	Removed reference to sickle testing
11-2017	11	1.2	Updated figures for service description
11-2017	11	1.4	Updated laboratory contact details
11-2017	11	1.7	Added instruction for processing G&S samples on call
11-2017	11	3.6	Added reference to external test requirement lists available on the wards.
11-2017	11	4.1/4.3	Added time and date of sampling/ requirement for clinical details to BT specimen
11-2017	11	5.3	Updated reference to lab procedure to SLH-LAB-LP-005
11-2017	11	6.6	Added section on phoning critical GP results out of hours.
11-2017	11	9.6	Updated section on second sample requirements to include samples labeled by blood track
11-2017	11	9.15	Created new section on major hemorrhage plan.
11-2017	11	10.2	Updated D-dimer testing to include DVT pathway.
11-2017	11	10.5	Changed critical alert ranges for D-dimer to > 7650 FEU
July 2020	12	1.3	Update contacts
July 2020	12	4.8	Update transport times to UHW
July 2020	12	5.8	Add EI
July 2020	12	6.3	Update for electronic reporting in UWH & histology printing in UHW
July 2020	12	6.6	Update process flow on critical results
July 2020	12	6.7	Update for healthmail
July 2020	12	9.6	2nd sample for all –not just hand labels
July 2020	12	9.8	Plasma 5 days after thawing
July 2020	12	11.2	Update BNP/HCG/Procalcitonin. Remove individual NA/K
July 2020	12	10.5	Reference Ranges TAT on coag assays/ link to SJH/ Accreditation status
April 2022	13	All	Update outlining temporary suspension of accreditation for all elements of scope

April 2022	13	4.3	Address and location taken out of mandatory section in request form.
April 2022	13	9.1	updated to include EI
April 2022	13	All	Updated to reflect Q-Pulse Document control
April 2022	13	12	Inclusion of Microbiology Section
April 2022	13	All	Inclusion of Microbiology discipline
April 2022	13	5.6	Updated table for BT sample retention times
April 2022	13	11.7	Addition of reference ranges advise for pregnant patients
April 2022	13	9.7	Addition of EI
April 2022	13	9.11	Updated to say emergency neonatal unit available if possible from NBC
Sept 23	14	1.1	Master copy in Q Pulse, remove reference to copies on G Drive/ Regional share
Sept 23	14	1.2	Update for micro & tracking of histology samples . Update staffing
Sept 23	14	1.3	Update accreditation status
Sept 23	14	1.4	Updated table
Sept 23	14	1.7	Removed IM from on call
Sept 23	14	1.8	Updated table
Sept 23	14	1.9	Took out reference to uncontrolled copies on wards
Sept 23	14	4.2	Update UHW request forms
Sept 23	14	4.7	Updated Pods table
Sept 23	14	9.1	Update accreditation status
Sept 23	14	9.8	Updated MSBOS
Sept 23	14	9.11	Updated CP SOP reference & included new Obstetric PPH guideline
Sept 23	14	9.13	Updated SOP reference
Sept 23	14	9.14	Changed link to document hub

Sept 23	14	11.2	Added HCG to table and updated information on lactate
Sept 23	14	15	Updated Appendices
Sept 24	15	11.3	Update phone number for Biochemistry
Sept 24	15	11.8	Update Critical Alert Ranges for AST and ALT
	15	All	See updates in change details of Q-Pulse

16 References/Bibliography

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BCSH Guidelines for pre-transfusion compatibility procedures in blood transfusion laboratories 2012

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Practical Transfusion Medicine. Murphy and Pamphilon 2005 Blackwell Publishing

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Transfusion Medicine, 1996, 6, 261-271.

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17 Sample requirements for Adult Tests (SLH & Referral laboratories including UHW Laboratory)

Please check this form before phlebotomy for sample requirements. **Only contact the laboratory if the test required is not listed.**

Note 1:Tests highlighted must be sent on a SLH request form as they require extra pre examination preparation before sending to referral laboratory.

Note 2: Some clinical areas (ED/MAU/ONC/ICU) are using Green Li Heparin bottles for all SLH Biochemistry in SLH in order to allow speedier processing.

TEST NAME	SPECIMEN TYPE	BOTTLE COLOUR	DEPT.
A			
1,25 Dihydroxy Vitamin D (see note No.1)	Serum	Yellow	Use SLH form
A 1 Anti Trypsin	Serum	Yellow	Biochemistry UHW
A 1 Anti Trypsin Phenotype	Serum	Yellow	Biochemistry UHW
Acetaminophin (Paracetamol)	Serum/ Lithium Heparin	Yellow/Green	SLH Form
ACTH (see Note 1)	EDTA + Aprotinin Special tube from Lab	In SLH Lab	Use SLH Form
Activated Protein C Resistance (APCR) (see note 1)	Trisodium Citrate x 3	Blue	Use SLH Form
Adenovirus	Serum	Yellow	Serology
ADH (Vasopressin) see note 1	EDTA + Aprotinin	Pink top	Use SLH Form
Albumin	Serum/ Lithium Heparin	Yellow/Green	SLH Form
Albumin Creatinine Ratio	Urine	Yellow Monovette Urine syringe	Biochem UHW
Alcohol	Flouride Oxylate	Grey	SLH Form
Aldosterone	EDTA	Purple	Use SLH Form
Alk. Phos. Isoenzymes	Serum	Yellow	Biochem UHW
Alpha Fetoprotein	Serum	Yellow	Biochem UHW
Alpha Gliadin Antibodies	Serum	Yellow	Autoantibody Lab.
Alpha1 Antitrypsin	Serum	Yellow	Biochem UHW
ALT	Serum/Lithium Heparin	Yellow/Green	SLH Form
Aluminium	Plasma	Navy Blue from Lab	Biochem UHW
AMH (Anti Mullerian Hormone)	Serum	Yellow	Use SLH Form
Amikacin	Serum	Yellow	Biochem UHW
Amino Acids (see note 1)	Lithium Heparin	Green	Use Metabolic Form
Amino Acids (see note1)	Urine	Plain- No Boric Acid	Use Metabolic Form

Aminolevulinic Acid (protect from light)	Urine	Plain no Boric Acid	SLH form
Aminophylline	Serum	Yellow	Biochem UHW
Amiodarone (Cordarone) See Note 1	Serum	Yellow	Use SLH Form
Ammonia (see note No. 1)	Plasma	Green	Use SLH Form
Amylase	Serum/Lithium Heparin	Yellow/Green	SLH Form
Androstendione	Serum	Yellow	Biochem UHW
Angelmans (Do not send Friday)	Lithium Heparin x2 EDTA x2	Green x2 Purple x2	Crumlin genetics Form with SLH form
Angiotensin Converting Enzyme	Serum	Yellow	Biochem UHW
Anti-Acetylcholine Receptor Antibodies (AChR Ab)	Serum	Yellow	SLH Form
Anti Adrenal Antibodies	Serum	Yellow	Autoantibody Lab.
Anti Cardiolipin Antibodies(CLA)	Serum	Yellow	Autoantibody Lab.
Anti centromere antibodies	Serum	Yellow	Autoantibody Lab.
Anti- Ds DNA Antibodies	Serum	Yellow	Autoantibody Lab.
Anti-Endomysial Antibodies	Serum	Yellow	Autoantibody Lab.
Anti Factor Xa (see note No. 1)	Trisodium Citrate X 3	Blue	Use SLH Form
Anti- Ganglioside Antibodies (GM1& GO1B)	Serum	Yellow	Autoantibody Lab.
Anti-Glomerular Basement Membrane Antibodies	Serum	Yellow	Autoantibody Lab.
Anti-Glutamic Acid Dehydrogenase Antibodies	Serum	Yellow	Autoantibody Lab.
Anti-Histone Antibodies	Serum	Yellow	Autoantibody Lab.
Anti IgA antibodies	Serum	Yellow	Autoantibody Lab.
Anti IgG antibodies	Serum	Yellow	Autoantibody Lab.
Anti IgM antibodies	Serum	Yellow	Autoantibody Lab.
Anti-Insulin Antibodies	Serum	Yellow	Autoantibody Lab.
Anti-Intrinsic Factor Antibodies	Serum	Yellow	Autoantibody Lab.
Anti- Islet Cell Antibodies	Serum	Yellow	Autoantibody Lab.
Anti Jo-1 antibodies	Serum	Yellow	Autoantibody Lab.
Anti- Liver Kidney Microsomal Antibodies	Serum	Yellow	Autoantibody Lab.
Anti-Mitochondrial Antibodies	Serum	Yellow	Autoantibody Lab.
Anti-Motor End Plate Antibodies	Serum	Yellow	Autoantibody Lab.
Anti-Muscle Specific Tyrosine Kinase Antibodies	Serum	Yellow	Autoantibody Lab.
Anti- Myelin Antibodies	Serum	Yellow	Autoantibody Lab.
Anti- Myeloperoxidase Antibodies	Serum	Yellow	Autoantibody Lab.

Anti Nerve Cell Antibodies (Hu Ri & Yo)	Serum	Yellow	Autoantibody Lab.
Anti Neutrophil Cytoplasmic Antibodies(ANCA)	Serum	Yellow	Autoantibody Lab.
Anti Nuyellow Antibodies(ANA)	Serum	Yellow	Autoantibody Lab.
Anti Ovarian Antibodies	Serum	Yellow	Autoantibody Lab.
Anti-Parathyroid Antibodies	Serum	Yellow	Autoantibody Lab.
Anti- Parietal Cell Antibodies	Serum	Yellow	Autoantibody Lab.
Anti Phospholipid Antibodies	Serum	Yellow	Autoantibody Lab.
Anti-Pituitary Antibodies	Serum	Yellow	Autoantibody Lab.
Anti-Proteinase 3 Antibodies	Serum	Yellow	Autoantibody Lab.
Anti-Reticulin Antibodies	Serum	Yellow	Autoantibody Lab.
Anti RNP antibodies	Serum	Yellow	Autoantibody Lab.
Anti-Salivary Glands Antibodies	Serum	Yellow	Autoantibody Lab.
Anti Scl 70 antibodies	Serum	Yellow	Autoantibody Lab.
Anti-Skin Basement Membrane Antibodies	Serum	Yellow	Autoantibody Lab.
Anti-Skin Epithelial Intracellular Antibodies	Serum	Yellow	Autoantibody Lab.
Anti-Striated Muscle Antibodies	Serum	Yellow	Autoantibody Lab.
Anti SM (Smith) antibodies	Serum	Yellow	Autoantibody Lab.
Anti Sperm Antibodies	Serum	Yellow send to lab <15 mins for freezing	Autoantibody Lab.
Anti SS-A antibodies	Serum	Yellow	Autoantibody Lab.
Anti SS-B antibodies	Serum	Yellow	Autoantibody Lab.
Anti Streptolysin O titre (ASOT)	Serum	Yellow	Serology UHW
Anti-Testicular Antibodies	Serum	Yellow	Autoantibody Lab.
Anti Thyroid Antibodies	Serum	Yellow	Autoantibody Lab.
Anti-Thyroglobulin Antibodies	Serum	Yellow	Autoantibody Lab.
Anti-Thyroid Microsomal Antibodies	Serum	Yellow	Autoantibody Lab.
Anti-Thyroid Peroxidase Antibodies	Serum	Yellow	Autoantibody Lab.
Anti-Tissue Transglutaminase Antibodies	Serum	Yellow	Autoantibody Lab.
Anti-TSH Receptor Antibodies (TRAB)	Serum	Yellow	Autoantibody Lab.
Anti-Voltage Gated Ca Channel Antibodies	Serum	Yellow	Autoantibody Lab.
Anti-Voltage Gated Potassium Channel	Serum	Yellow	Autoantibody Lab.
Anti-Hepatitis B titre	Serum	Yellow	Serology UHW
Antithrombin III See Note 1	Trisodium Citrate x 3	Blue	Use SLH Form
APTT	Trisodium Citrate	Blue	SLH Form

Aspergillus Antibodies	Serum	Yellow	Serology UHW External
Aspirin/ Salicylate	Serum	Yellow	Biochem UHW
AST	Serum/Lithium Heparin	Yellow/Green	SLH Form
Atypical pneumonia screen	Serum	Yellow	Serology UHW External
Autoantibody Screen(AAS)	Serum	Yellow	Autoantibody Lab.
Avian Antibodies	Serum	Yellow	Serology UHW External
Avian Precipitans	Serum	Yellow	Serology UHW
B			
B2 Glycoprotein 1	Serum	Yellow	Autoantibody Lab.
Bartonella/ Cat Scratch	Serum	Yellow	Serology UHW
Bence Jones Prot.	Urine EMU	Plain- No Boric Acid	Biochem UHW
Beta 2 Microglobulin	Serum	Yellow	Biochem UHW
Beta HCG	Serum	Yellow	SLH Form
Bile Acids	Serum	Yellow	Biochem UHW
Bilirubin (Total/ Direct)	Serum/Lithium Heparin	Yellow/Green	SLH Form
Bird fanciers Disease	Serum	Yellow	Serology UHW External
Blood Group, Antibody Screen, Crossmatch or DCT	EDTA	Pink-6ml	Blood Trans SLH or UHW if Ante Natal
Bone Marrow Aspirate (BMA) Discuss with Haematology Team	BMA Slides		Haem UHW
Bone Marrow Aspirate (For Cytogenetics) Discuss with Haematology Team	Lithium Heparin	Green	Haem UHW external
Borrelia burgdorferi antibodies (see Lyme serology)			
BNP (**Once per admission only**)	EDTA	Purple	SLH Form
Brucella	Serum	Yellow	Serology UHW
C			
C Peptide See Note 1	Serum	Yellow	Use SLH Form
C1 Esterase Inhibitor	Serum and Citrate	Contact Lab for bottles	Biochem UHW External
C3/C4	Serum	Yellow	Biochem UHW
CA125	Serum	Yellow	Biochem UHW
CA153	Serum	Yellow	Biochem UHW
CA199	Serum	Yellow	Biochem UHW
Caeruloplasmin	Serum	Yellow	Biochem. UHW
Caffeine See note 1	Serum	Yellow	Use SLH Form

Calcium	Serum/Lithium Heparin	Yellow/Green	SLH Form
Calcitonin (see Note No. 1)	Serum x 2	Yellow	Use SLH Form
Calprotectin	Stool	Blue topped stool sample container	Use blue calprotectin request form- **ensure date and time of sample is completed**
Campylobacter serology	Serum	Yellow	Serology UHW External
Carbamazapine	Serum	Yellow	Biochem UHW
Cardiolipin antibodies	Serum	Yellow	Autoantibody Lab.
Carnitine (Free & Total) See Note 1	Lithium Heparin	Green	SLH form + Metabolic Form
Catecholamines (see Note No.1) Blood & Urine	EDTA & 24 Hour Urine Acid	Purple & Acidified urine	Use SLH Form for Blood
CEA	Serum	Yellow	Biochem UHW
CGH Array	EDTA	Purple	Crumlin Genetics Form with SLH form
Chlamydia pneumoniae	Serum	Yellow	Serology External
Chlamydia pscittici	Serum	Yellow	Serology External
Chloride	Serum/Lithium Heparin	Yellow/Green	SLH Form
Cholinesterase (Acetylcholinesterase/ erythrocyte cholinesterase)	EDTA	Purple	Biochem. UHW
Cholesterol	Serum	Yellow	Biochem. UHW
Chromosome Analysis, karyotyping (Do not send Fridays)	Lithium Heparin	Green	Crumlin Genetics form with SLH
Chromogranin A	Serum	Yellow	Use SLH form
CMV PCR	EDTA	Purple	Serology UHW
CPK	Serum/Lithium Heparin	Yellow/Green	SLH Form
Coagulation factor assays(multiple assays) (see note No. 1)	Trisodium Citrate X 6	Blue	Use SLH Form
Coagulation factor assays(single assay) (see note No. 1)	Trisodium Citrate X 3	Blue	Use SLH Form
Complement C3/C4	Serum	Yellow	Biochem UHW
Coagulation Screen	Trisodium Citrate	Blue	Use SLH Form
Complement Titre CH50/CH100 See Note 1	Serum	Yellow	Use SLH Form

Copper	Plasma Urine	Navy Blue From Lab 24 Hour Plain Urine	Biochem UHW
Cordarone (Amiodarone) See Note 1	Serum	Red top serum	Use SLH Form
Cortisol	Serum Urine	Yellow 24 hour plain	Biochem UHW
Creatinine Urine	Urine	Random Plain No Boric Acid	Biochem UHW
Creatinine Clearance	Urine & Serum	24 hour Plain & Yellow	Biochem UHW
CRP	Serum/Lithium Heparin	Yellow/Green	SLH Form
CSF Cell Count & Culture	Sterile Universal	Plain	UHW Microbiology with SLH form (NB ring lab to advise)
CSF Protein	Sterile Universal	Plain	Biochem UHW
CSF Glucose	Fluoride Oxylate	Yellow	Biochem UHW
Cyclosporin	EDTA	Purple	Haem UHW
Cystic Fibrosis (Do not send Friday)	EDTA	Purple	Crumlin Genetics Form
Cystine	Urine	24 hr. Urine - Acidified	Biochem. UHW
Cytogenetics (Do not send Friday)	Lithium Heparin + EDTA	Green + Purple	Crumlin genetics form
Cytomegalovirus (CMV)	Serum	Yellow	Serology External
Cytotoxic antibodies	Serum x2	Yellow	Autoantibody Lab.
D			
D Dimer	Trisodium Citrate	Blue	SLH Form
DEAFF test for Cytomegalovirus (CMV)	Urine	Sterile universal	Serology External
Dengue Fever	Serum	Yellow	Serology
11 Deoxycortisol	Serum	Yellow	Biochem. UHW
DHEA/S (Dehydroepiandrosterone/ Sulphate)	Serum	Yellow	SLH form
Di-George-Do not send Friday	Lithium Heparin + EDTA	Green + Purple	Crumlin Genetics form + SLH form
Digoxin	Serum	Yellow	Biochem UHW
Dihydrotestosterone	Serum	Yellow	Biochem. UHW External
DNA Analysis	EDTA	Purple	Crumlin Genetics Form with SLH form
Down Syndrome (Contact Lab if Urgent)	Lithium Heparin + EDTA	Green	Crumlin Genetics form with SLH form

Drugs Of Abuse	Urine or serum	Plain- No Boric Acid Yellow	Biochem. UHW
E			
Epstein Barr Virus (EBV)	Serum	Yellow	Serology UHW External
Electron Microscopy (Faeces & Fluids)	Faeces/Fluids		Serology UHW
Electrophoresis (Albumin, Alpha, Beta and Gamma Globulins)	Serum	Yellow	Biochem. UHW
Enterovirus	Serum	Yellow	Serology UHW
Epanutin (Phenytoin)	Serum	Yellow	Biochem UHW
Epilim (Valporic Acid , Sodium Valporate)	Serum	Yellow	Biochem UHW
Erythropoietin, Do not send on Fridays	Serum	Yellow	SLH Form
ESR- **Strictly** limited to clinical conditions use CRP instead	EDTA	Purple	SLH form
Extractable Nuclear Antigens	Serum	Yellow	Auto Antibody Lab
F			
Fabrys Disease	EDTA x2 Lithium Heparin x2	Purple x2 Green x2	Crumlin Genetics form with SLH
Factor V Leiden Mutation (**MUST** have abnormal Thrombophillia screen) (See note No. 1)	EDTA	Purple	Use SLH Form
Faeces for Viral culture.	Faeces	Universal with spoon	Serology UHW
Fanconi Anaemia discuss with Haematologist first, not on Friday 's	EDTA	Purple	Haem. UHW
Farmer's Lung Antibodies	Serum	Yellow	Serology UHW
FBC	EDTA	Purple	SLH Form
Ferritin	Serum	Yellow	Haem UHW
Flecanide (Tambocar) See Note 1	Serum x2	Red top serum x2	Use SLH Form with TDM form from Lab
Fluid Analysis (Protein, LDH Glucose, Cell count)	Analysers cannot sample viscous samples, EDTA for cell counts	Universal Plain Purple Grey (glucose)	UHW forms
FK506 (Tacrolimus) Do not send Friday	EDTA x2	Purple x2	SLH Form
FOB	Faeces	Card	Biochem UHW
Folic Acid	Serum	Yellow	Biochem UHW
Fragile X Syndrome	EDTA	Purple	Crumlin Genetics form with SLH form
Free T4	Serum	Yellow	Biochem UHW
Fructosamine Do not send on Fridays	Serum	Yellow	Haem UHW

FSH	Serum	Yellow	Biochem UHW
G			
G6PD (see note No. 1) Do not send Fridays	EDTA	Purple	Use SLH Form
GGT	Serum/Lithium Heparin	Yellow/Green	SLH Form
Gamma Globulin's	Serum	Yellow	Biochem UHW
Gastrin (see note No. 1) Must be fasting 16 hours	Serum	Yellow	Use SLH form
Gauchers screen (Discuss with Haematologist first)	Lithium heparin	Green	Haem UHW
Gentamycin	Serum	Yellow	Biochem UHW
Glucose	Flouride Oxylate	Grey	SLH Form
Glucagon See Note 1	EDTA + Aprotinin	Pink Top	Use SLH Form
Glycosylated Haemoglobin (HbA1C)	EDTA	Purple	Haem UHW
Growth Hormone (see note No. 1)	Serum	Yellow	Use SLH Form
H			
17 Hydroxyprogesterone	Serum/Lithium Heparin	Yellow/green	Biochemistry UHW
5 HIAA (Hydroxyindole acetic acid)	24 Hour Urine-Acid	24 hour container with acid	Biochemistry UHW
HLA Typing Disease Association & Pre Transplant	EDTA	Pink-6ml x 2	Blood Trans UHW + NHIRL form.
Haematinic Screen (B12, folate, ferritin)	Serum	Yellow	Biochem UHW
Haemochromatosis Screen (see note No. 1)	EDTA	Purple	Use SLH Form & Biominis Genetics consent form
Haemoglobinopathies Screen (see note No. 1)	EDTA + Serum	Purple + Yellow	Use SLH Form + Haemoglobinopathy form
Haptoglobin/HAP	Serum	Yellow	Biochem UHW
HDL	Serum	Yellow	Biochem UHW
Helicobacter pylori	Serum	Yellow	Serology UHW External
Helicobacter pylori antigen	Stool	Blue topped stool sample container	Use H. Pylori antigen available in lab
Hepatitis A Antibody	Serum	Yellow	Serology UHW External
Hepatitis B Antibody	Serum	Yellow	Serology UHW External
Hepatitis B PCR (see note No. 1)	Serum	Yellow	Use NVRL Form with SLH form

Hepatitis B sAg	Serum	Yellow	Serology UHW External
Hepatitis B DNA Viral Load	EDTA	Purple	Use NVRL Form with SLH form
Hepatitis C Antibody	Serum	Yellow	Serology UHW External
Hepatitis C PCR (see note No. 1)	EDTA	Purple	Use NVRL Form with SLH form
Hepatitis C Genotyping	EDTA	Purple	Use NVRL Form with SLH form
Hepatitis E Antibody	Serum/ EDTA	Yeollow/Purple	Serology UHW
Herpes Simplex Virus (HSV)	Pink top viral swab	Pink top viral swab	Serology UHW External
Histoplasmosis	Serum	Yellow	Serology UHW
HIT Screen(Heparin Induced Thrombocytopenia) (See note 1)	Serum 2 x 6ml	Yellow	Use SLH Form
Homocysteine (Thrombophilia Screen) See Note 1 Metabolic Deficiency	EDTA Lithium Heparin	Purple Green	Use SLH Form
Homocysteine/Cysteine (See Note1)	Plasma x 2	Green	Use SLH Form
Human Immunodeficiency Virus (HIV)	Serum	Yellow	Serology
Human Immunodeficiency Virus (HIV) PCR (See Note1)	EDTA	Purple	Use SLH Form
Hydroxyproline see dietary requirements	24 Hour Urine Plain	24 Hour Urine	Biochemistry UHW
I			
Ig E Rast only on abnormal total result	Serum	Yellow	Biochemistry UHW
IgE Total	Serum	Yellow	Biochem UHW
IGF1 (Insulin Like Growth Factor 1) See Note 1	Serum	Yellow	Use SLH Form
IGF2 (See Note 1)	Serum	Yellow	Use SLH Form
IGF4 (see note 1)	Serum	Yellow	Use SLH Form
IGF Binding Protein 3 See Note 1	Serum	Yellow	Use SLH Form
IgG Subclasses NB Clinical Details	Serum	Yellow	Biochemistry UHW External
IgG/IgA/IgM	Serum	Yellow	Biochem UHW
IM Screen	EDTA/Lithium Heparin	Purple/Green	SLH Form
Immune Complexes	Serum	Yellow	Autoantibody Lab.
Immunoglobulins	Serum	Yellow	Biochem UHW
Immunophenotyping (lymphocyte subsets) (See note 1) Not on Fridays	EDTA X 2	Purple	Use SLH Form

Immunophenotyping (malignancy) (See note 1) Not on Friday s	EDTA blood or marrow.		Use SLH Form
Influenza A & B/ RSV /SARS COV2	Nasopharyngeal swab	Red top Naso swab	SLH Fast trak form Urgent Micro UHW – not urgent
Insulin	Serum	Yellow	Use SLH Form
Iron/FE	Serum	Yellow	Biochem UHW
K			
Karyotyping (Not on Friday)	Lithium Heparin	Green	Crumlin genetics form with SLH form
Kleinfelter Syndrome (Not on Friday)	Lithium Heparin	Green	Crumlin genetics form with SLH form
Kleihauer	EDTA	Purple	Haematology UHW
L			
Lactate	Flouride Oxylate or heparinsed syringe for analysis on POCT Blood Gas analyser	Grey	Use SLH Form
Lanoxin (Digoxin)	Serum	Yellow	Biochem UHW
LDL	Serum	Yellow	Biochem. UHW
Lead	EDTA	Purple	Biochem UHW
Lebers HePurpleitary Opic Neuropathy Contact lab prior to sending	EDTA & Lithium Heparin	Purple & Green	Crumlin genetics form with SLH form
Legionella Antibodies	Serum	Yellow	Serology External
Leptospiral serology (Weils Disease)	Serum	Yellow	Serology External
LFT	Serum/Lithium Heparin	Yellow/Green	SLH Form
LH	Serum	Yellow	Biochem UHW
Lipoprotein Profile	Serum	Yellow	Biochem UHW External
Lithium	Serum	Yellow	Biochem UHW
Lupus Anticoagulant (See note 1)	Trisodium Citrate x 3	Blue	Use SLH Form
Lyme serology (B.burdorferi)	Serum	Yellow	Serology UHW
Lysozyme Do not send Friday	Serum	Yellow	Haematology UHW
M			
Magnesium	Serum/Lithium Heparin	Yellow/Green	SLH Form

Malaria Screen (See note 1)	EDTA	Purple	Use SLH Form
Measles antibodies	Serum	Yellow	Serology UHW External
Meningococcus -PCR	EDTA	Purple	Microbiology
Mercury	Whole Blood	Green or Purple	Biochemistry UHW External
Metabolic Screen Includes urine organic acid & serum amino acid, See Metabolic form for full details	Lithium Heparinx 1 Urine (plain)	Green Clear top	Use Temple St Metabolic Form with SLH
Methotrexate	Serum/Lithium Heparin	Yellow/Green	Biochemistry UHW External
Microalbumin	Urine	Yellow urine monovette syringe	Biochemistry UHW
Molecular Genetics	EDTA	Purple	Use Crumlin genetics form with SLH Form
Monospot (IM Screen)	EDTA/Lithium Heparin	Purple/Green	SLH Form
Mucopolysaccharidoses (initial screen -GAG's) see note 1	Urine EDTA	Plain- No Boric Acid Purple	Use SLH form
Mumps	Serum	Yellow	Serology UHW
Mycophenolic acid (Cellcept) Do not send Friday s	EDTA	Purple	Haem UHW
Mycoplasma pneumoniae	Serum	Yellow	Serology UHW
Myeloma Screen	Serum	Yellow	Biochem UHW
Myoglobin	Urine	Plain- No Boric Acid	Biochemistry UHW
N			
Neurone Specific Enolase (NSE) See note 1 Do not send on Fridays	Serum	Yellow	Use SLH form
Neutrophil Alkaline Phosphatase (NAP score) Discuss with Haematologist	EDTA and blood films	Purple	Use SLH Form
Newcastle Hypoglycaemic Screen	Urine Serum Lithium Heparin Guthrie card	See Hypoglycaemic form for full details	Use Hypoglycaemic Form with SLH form
O			
Oestradiol	Serum	Yellow	Biochem UHW
Oligoclonal Bands	Serum/CSF	Yellow	Biochem UHW
Organic Acids (See Note 1)	Urine	Plain- No Boric Acid	Use Metabolic Form with SLH
Osmolality-Serum	Serum	Yellow	Biochem UHW
Osmolality-Urinary	Urine	Yellow urine monovette syringe	Biochem UHW

Osmotic Fragility (See note 1) Do not send Friday s	EDTA	Purple	Use SLH Form
Oxalate See Note	Serum- 2ml	Yellow	Use SLH Form
Oxalate	Urine Acid	24 hour	Eurofins Metabolic form with SLGH form
P			
Pancreatic Polypeptide- See note 1	Plasma	Red top	Use SLH form
Paracetamol	Serum/Lithium Heparin	Yellow/Green	SLH Form
PBG Analysis (Protect from light) during acute attack	Urine	Plain- No Boric Acid	Use SLH form
Phenobarbitone before next dose	Serum	Yellow	Biochem UHW
Phenytoin before next dose	Serum	Yellow	Biochem UHW
Phosphate-Blood	Serum/Lithium Heparin	Yellow/Green	SLH Form
Phosphate- Urine	Urine plain	24 hour or spot yellow urine monovette syringe	Biochem UHW
Plasma Viscosity Do not send Friday	EDTA	Purple	Haem UHW
Platelet Allo-Antibodies Discuss with Haematologist first	Serum	Yellow x 2	IBTS request form from Lab
Pneumococcal antibodies	Serum	Yellow	Serology UHW External
PNH screen (See note 1)	EDTA	Purple	Use SLH Form
Polio Virus	Serum	Yellow	Serology UHW
Porphyria Screen (Protect from Light) See Note 1	Urine + random faeces + 2 EDTA if skin involvement	24 hr. Urine Faeces Purple x2	Use SLH Form
Potassium- Blood	Serum/Lithium Heparin	Yellow/Green	Use SLH Form
Potassium - Urine	Urine plain	24 hour or spot yellow urine monovette syringe	Biochem UHW
Pradi Willi Do not send Fridays	Lithium Heparin + EDTA	Green + Purple	Crumlin Genetics form with SLH form
Priadel	Serum	Yellow	Biochem UHW
Procollagen peptide Type III See note 1	Serum x2	Red top x 2	Use SLH Form
Progesterone	Serum	Yellow	Biochem UHW
Prograft Level	EDTA x2	Purple x2	Use SLH form
Prolactin	Serum	Yellow	Biochem UHW

Protein- Blood	Serum/ Lithium Heparin	Yellow/Green	SLH Form
Protein - Urine	Urine plain	24 hour or spot yellow urine monovette syringe	Biochem UHW
Protein/ Creatinine ratio	Urine random	yellow urine monovette syringe	Biochem UHW
Protein C (PC) (See note 1)	Trisodium Citrate x3	Blue x3	Use SLH Form
Protein S (PS) (See note 1)	Trisodium Citrate x3	Blue x3	Use SLH Form
Prothrombin mutation -Do not send Friday Consultant Haematologist approval required	EDTA	Purple	SLH form + Eurofins Genetics form
PSA	Serum	Yellow	Biochem UHW
Pseudocholinesterase	Lithium Heparin	Green	Biochem UHW External
PT/INR	Trisodium Citrate	Blue	SLH Form
PTH (See Note 1)	EDTA	Purple	Use SLH Form
Purine Testing See note 1	Urine	Plain -no boric acid	Use SLH Form
Pyruvate Kinase (See note 1) Do not send friday	EDTA	Purple	Use SLH Form
Q			
Q Fever/Coxiella burnetti	Serum	Yellow	Serology UHW External
Quantiferon	Serum	Special Tubes from lab	UHW Microbiology return pack containing all sample bottles to the lab before 11am daily mon - fri
R			
Rast Include Rast Form	Serum	Yellow	Biochem UHW
Purple Cell Glycogen Do not send Friday arrange with lab prior to taking	Lithium Heparin	Green	Use SLH form
Red Cell Folate Contact UHW Lab	EDTA	Purple	Haem UHW
Red Cell Transketolase Do Not send Friday	Lithium Heparin	Green	Haem UHW
Reducing Substances (Faeces) (See note 1)	Faeces	Faeces Bottle	Use SLH Form
Renin (See note 1)	EDTA	Purple	Use SLH Form
Reticulocyte Count	EDTA	Purple	Haem UHW
Rheumatoid factor.	Serum	Yellow	Serology

Retinol Binding Protein	Serum or spot urine	Yellow	Use SLH form
Rubella	Serum	Yellow	Serology
S			
Salicylate	Serum	Yellow	Biochem UHW
Save serum- post inoculation injury	Serum	Yellow	Serology
Selenium	Na Heparin plasma	Navy bottles from Lab	Biochem UHW
Serotonin (5 Hydroxytryptamine) See note 1	Lithium Heparin x2	Green x2	Use SLH Form
Sex Hormone Binding Globulin (SHBG)	Serum	Yellow	Biochemistry UHW External
Sirolimus Assay Do not send Friday	EDTA	Purple	Haematology UHW external
Sickle Cell Screen (Electrophoresis) Urgent Pre Op – UHW Non Urgent – St James	EDTA	Purple	Use SLH Form
Sodium- Blood	Serum/Lithium Heparin	Yellow/Green	SLH Form
Sodium -Urine	Urine Plain	Spot-Urine monovette syringe or 24 Hour	SLH Form Biochem UHW
Sodium Valporate	Serum	Yellow	Biochem UHW
Somatostatin See note 1	EDTA + Aprotinin	available in Lab	Use SLH Form
Stone Analysis	STONE	Universal Container	Biochemistry UHW External
Sulphonyl Urea Consultant only request	Serum or 24 hr plain urine	Yellow	Use SLH form
Synacthen	Serum	Yellow	Biochem UHW
Syphilis serology	Serum	Yellow	Serology
T			
T3 Need clinical details	Serum	Yellow	Biochem UHW
T4 only if TSH Abnormal or < 16 yrs or at endocrinologist request	Serum	Yellow	Biochem UHW
Tacrolimus assay Do not send Friday s	EDTA	Purple	Use SLH form
Targocid/Teicoplanin	Serum	Yellow	Biochem UHW External
Thyroxin Binding Globulin See note 1	Serum	Yellow	Use SLH Form
Tegretol	Serum	Yellow	Biochem UHW
Testosterone	Serum	Yellow	Biochem UHW
Theophylline (aminophylline)	Serum	Yellow	Biochem UHW
Thiopurine methyltransferase	EDTA – phenotype	Purple	Use SLH form

	Lithium Heparin - activity	Green	
Thyroglobulin	Serum	Yellow	Biochem UHW
Thrombophilia Screen (See note 1)	Trisodium Citrate x 6	Blue x6	Use SLH Form
Thyroid Function	Serum	Yellow	Biochem UHW
TIBC	Serum	Yellow	Biochem UHW
Tobramycin	Serum	Yellow	Biochem UHW
TORCH Screen	Serum	Yellow	Serology UHW External
Total & Free Carnitine	Li Heparin	Green	Use Metabolic form with SLH
Toxicology (Blood / Urine)	Serum/Urine	Yellow or Urine Spec.	Biochemistry UHW External
Toxocara Antibodies	Serum	Yellow	Serology UHW External
Toxoplasma Antibodies	Serum	Yellow	Serology UHW External
Toxoplasma-PCR	EDTA	Purple	Serology UHW External
Transferrin	Serum	Yellow	Biochem UHW
Troponin	EDTA	Purple	SLH Form
Triglyceride	Serum	Yellow	Biochem. UHW
Tryptase asap after anaphylactic shock, then at 2 + 8 hours	Serum	Yellow	Use SLH form
TSH	Serum	Yellow	Biochem UHW
Turners Syndrome Do not send on Fridays	Lithium Heparin + EDTA	Green + Purple	Crumlin Genetics form with SLH form
U			
U&E	Serum/Lithium Heparin	Yellow/Green	SLH Form
Urea	Serum/Lithium Heparin	Yellow/Green	SLH Form
Uniphylline	Serum	Yellow	Biochem UHW
Urinary Osmolality	Urine	Yellow urine monovette syringe	Biochemistry UHW
Urinary Oxalate	Urine	24 hr. Urine – Acidified	Biochemistry UHW External
Urinary Urea	Urine	24 hour or spot Yellow urine monovette syringe	Biochem UHW
Uric Acid (Urate)	Serum/Lithium Heparin	Yellow/Green	SLH Form

Urinary Uric Acid	Urine	24 hour or spot Yellow urine monovette syringe	Biochem UHW
V			
Valproate	Serum	Yellow	Biochem UHW
Vancomycin	Serum	Yellow	Biochem UHW
Varicella zoster serology (VZV)	Serum	Yellow	Serology
Viral Screen NB Clinical Details	Serum	Yellow	Serology
Vitamin A (protect from light) See note 1	Lithium Heparin	Green	Use SLH Form
Vitamin B12	Serum	Yellow	Biochem UHW
Vitamin D (See note 1)	Serum	Yellow	Use SLH Form
Vitamin E Protected from light see note 1	Serum	Yellow	Use SLH Form
VMA (Adult)	Urine	24 hr. Urine - Acidified	Biochemistry UHW External
VMA (Paediatric) to see note 1	Urine	Plain- No Boric Acid	Use SLH Form
Von Willebrands screen (See note 1) Discuss with Haematologist	Trisodium Citrate x 6	Blue	Use SLH Form
Warfarin Assay (See Note 1) Discuss with Haematologist	Trisodium Citrate	Blue	Use SLH Form
W			
Weils disease (See Leptospiral serology)	Serum	Yellow	Serology UHW
Y			
Yersinia Antibodies	Serum	Yellow	Serology UHW External
Z			
Zinc	Plasma	Navy Blue from lab	Biochemistry UHW

18 Appendix I Packaging Instruction P650

- **This packing instruction applies to UN No. 3373 (Diagnostic Specimens)**

1. The packaging shall be of good quality, strong enough to withstand the shocks and loadings normally encountered during carriage, including transhipment between vehicles or containers and between vehicles or containers and warehouse as any removal from a pallet or over pack for subsequent manual or mechanical handling. Packaging shall be constructed and closed to prevent any loss if contents that might be caused under normal conditions of carriage by vibration or by changes in temperature, humidity or pressure.

2. The packaging shall consist of three components

    a) a primary receptacle;
    b) a secondary packaging; and
    c) An outer packing.

3. Primary receptacles 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 of the outer packaging.

4. For carriage, the mark illustrated below shall be displayed on the external surface of the outer packaging on a background of a contrasting colour and shall 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.

5. The completed package shall be capable of successfully passing the drop test in 6.3.2.5. as specified in 6.3.2.3. and 6.3.2.4. except that the height of the drop shall not be less that 1.2m. The smallest external dimension of outer packaging shall be not less than 100mm. (See note).

(Note: This condition has been removed in a corrigendum issued by the UN dated, December 2004).

6. For liquid substance:
    a) The primary receptacle(s) shall be leak proof;
    b) The secondary packaging shall be leak proof;
    c) If multiple fragile primary receptacles are placed in a single secondary packaging, they shall be either individually wrapped or separated to prevent contact between them;
    d) Absorbent material shall be placed between the primary receptacles(s) and the secondary packaging. The absorbent material shall be in quantity sufficient to absorb the entire contents of the primary

receptacle(s) so that any release of the liquid substance will not compromise the integrity of the cushioning material or of the outer packaging;

e) The primary receptacle or the secondary packaging shall be capable of withstanding, without leakage, and internal pressure of 95 kPa (0.95 bar).

7. For solid substances:
   a) The primary receptacle(s) shall be sift proof;
   b) The secondary packaging shall be sift proof;
   c) If multiple fragile primary receptacles are placed in a single secondary packaging, they shall be either individually wrapped or separated to prevent contact between them.

8. Refrigerated or frozen specimens: Ice, dry ice and liquid nitrogen
   a) When dry ice or liquid nitrogen is used to keep specimens cold, all applicable requirements of ADR shall be met. When used, ice or dry ice shall be placed outside the secondary packaging or in the outer packaging or an over pack. Interior supports shall be provided to secure the secondary packaging in the original position after the ice or dry ice has dissipated. If ice is used, the outside packaging or over pack shall be leak proof. If carbon dioxide, solid (dry ice) is used, the packaging shall be designed and constructed to permit the release of carbon dioxide gas to prevent a build up of pressure that could rupture the packaging and the package (the outer packaging or the over pack) shall be marked “Carbon dioxide, solid” or “Dry ice”.
   b) The primary receptacle and the secondary packaging shall maintain their integrity at the temperature of the refrigerant used as well as the temperatures and the pressures, which could result if refrigeration were lost.

9. Infectious substances assigned to UN No. 3373 which are packed and packages which are marked in accordance with this packing instruction are not subject to any other requirement in ADR.

10. Clear instructions on filling and closing such packages shall be provided by packaging manufacturers and subsequent distribution to the consignor or to the person who prepares the package (e.g. patient) to enable the package to be correctly prepared for carriage.

11. If any substance has leaked and has been spilled in a vehicle or container, it may not be reused until after it has been thoroughly cleaned and, if necessary, disinfected or decontaminated. Any other goods and articles carried in the same vehicle or container shall be examined for possible contamination

19 Appendix II Management of Non-Obstetric Acute Massive Blood Loss