

Document No.: LP-GEN-0008	CONNOLLY HOSPITAL	Date of issue: 11 th January 2012
Revision No. 05	Pathology Department	Effective Date: 11 th January 2012

LABORATORY USER HANDBOOK



THIS EDITION SUPERSEDES ALL PREVIOUS EDITIONS

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1 INTRODUCTION

Welcome to the Connolly Hospital, Blanchardstown Pathology Laboratory user manual.

This user manual is designed to give an overview of services available in the Pathology Laboratory. It is intended as a quick reference guide for all Pathology users, both within Connolly Hospital, and those from outside agencies. Results of laboratory tests are made available to patients through their Clinicians or General Practitioners. All Pathology services undergo continuous review through quality assurance and audit activities.

Note: The Blood Transfusion service is not available for GP patients.

2 GUIDE TO USING THIS MANUAL

A controlled electronic copy of this manual is available to all clinical areas and general practitioners within the Connolly Hospital catchment area via the Connolly Hospital website: www.connollyhospital.ie. Information regarding laboratory tests and profiles can be located in the manual according to the department where the tests are performed.

3 GENERAL INFORMATION

Pathology Laboratory opening hours and telephone numbers are detailed in section 3.3. Pre-fix (01) 646 for direct access from outside Connolly Hospital. An on-call system operates outside normal hours for emergency work i.e. non-deferrable tests necessary for decisions regarding patient treatment. A limited service is available on Saturday mornings.

Postal Address

Pathology Laboratory

Connolly Hospital

Blanchardstown

Dublin 15

Ireland

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3.3 Opening Hours and Contact Numbers

Prefix (01) 646 for direct access from outside Connolly Hospital

OFFICE & SPECIMEN RECEPTION	CONTACT NUMBER	OPENING HOURS
Laboratory Office – Result Enquiries	5353 / 5352	9.00-17.00 Monday to Friday
Appointments for GP Patient Blood Testing	6465365	10.00-12.00 Monday to Friday
Specimen Reception	5314	08.00-20.00 Monday to Friday; 9.00-13.00 Saturday
Laboratory Fax	Bleep 158 8207747	Out of hours / On-call
PHLEBOTOMY	CONTACT NUMBER	OPENING HOURS
GP Phlebotomy Clinic	5375	07:15-12:15 Monday to Friday
GP Phlebotomy Appointments	6465365	10.00-12.00 Monday to Friday
CLINICAL BIOCHEMISTRY	CONTACT NUMBER	DEADLINE FOR RECEIPT OF ROUTINE SAMPLES
Main Laboratory	5311/5312	16:00 Monday to Friday
Endocrinology Laboratory	5313	12:00 Saturday*
Laboratory On-Call	Bleep 158	Out of hours
HAEMATOLOGY & BLOOD TRANSFUSION	CONTACT NUMBER	DEADLINE FOR RECEIPT OF ROUTINE SAMPLES
Routine Haematology	5305	16:30 Monday to Friday
Coagulation	5351	12:30 Saturday*
Blood Transfusion	5302	15:30 Monday to Friday 11:00 Saturday
Emergency / Massive Transfusion	5301	Anytime
Laboratory On-Call	Bleep 158	Out of hours
Haemovigilance Officer	5307 / Bleep 258	Monday to Friday routine laboratory hours
Haematology Registrar	5326 / Bleep 294	9.00-17.00 Monday to Friday
	Switch	Out of hours
		8.00-20.00 Monday to Friday 9.00-13.00 Saturday*
		8.00-20.00 Monday to Friday 9.00-13.00 Saturday*

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HISTOPATHOLOGY	CONTACT NUMBER	DEADLINE FOR RECEIPT OF ROUTINE SAMPLES	OPENING HOURS
Main Laboratory	5304	17:30 Monday to Friday	8.00-20.00 Monday to Friday
Specimen Reception	5306	12:30 Saturday*	9.00-13.00 Saturday*
Cytology Laboratory	5339		
Histopathology Office	5353 / 5352	9.00-17.00 Monday to Friday	
Registrar	5395	9.00-17.00 Monday to Friday	
MICROBIOLOGY	CONTACT NUMBER	DEADLINE FOR RECEIPT OF ROUTINE SAMPLES	OPENING HOURS
Routine Laboratory	5303	Monday to Friday: 12:30 Antibiotic Assays 17:00 Other Specimens Saturday: 10:30 Antibiotic Assays 11:30 Other Specimens Sunday: 10:30 Antibiotic Assays + Other Specimens	8.00-20.00 Monday to Friday 9.00-13.00 Saturday*
Infection Control	5372 / Bleep 191 5374 / Bleep 270	08.00-18.00 Monday to Wednesday 08.00-17.30 Thursday 09.00- 17.30 Friday	
Laboratory On-Call	Bleep 158	Out of hours	
Clinical Consultation	5396 / Switch Switch	9.00-17.00 Monday to Friday Out of hours	
MORTUARY	CONTACT NUMBER	HOURS	
Mortuary	5475	9.00 – 17.00 Monday to Friday	
PM Room	5426	Bleep 123 out of hours or contact Nursing Administration	

* A limited service is available on Saturday mornings.

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3.4 Contact Information

Key members of staff are listed below including their position and contact information. Prefix (01) 646 for direct access from outside Connolly Hospital.

Pathology Administration			
Laboratory Manager	Mr. Joe Feely	5394	joe.feely@hse.ie
Business Manager	Ms. Annette Murphy	5640	annette.obrienmurphy@hse.ie
Grade IV Officer	Ms. Elaine O'Connor	5353	elaine.oconnor@hse.ie
Quality Officer	Ms. Linda Martin	5302	linda.martin1@hse.ie
Phlebotomy			
Senior Phlebotomist	Ms. Noreen Farrell	Bleep 117	
Phlebotomist	Ms. Teresa Hannon	Bleep 116	
Phlebotomist	Ms. Liisa Kokko	Bleep 447	
Phlebotomist	Ms. Eleanor McGeever	Bleep 242	
Phlebotomist	Ms. Margaret Watts	Bleep 115	
Phlebotomist	Ms. Mary Gillespie		
Pathology Reception			
Laboratory Attendant	Ms. Valerie Kelly	5312	
Mortuary			
Mortuary Technician	Mr. John Fagan	5426 / Bleep 224	
Mortuary Attendant		5477 / Bleep 123	
Clinical Biochemistry			
Consultant Chemical Pathologist	Dr. Bill Tormey	8092676 / Switch	william.tormey@beaumont.ie
Senior Medical Scientists	Ms. Gemma Farrell	5311	emma.farrell@hse.ie
	Ms. Caroline Egan	5311	caroline.egan2@hse.ie
	Mr. John Carbury	5311	john.carbury@hse.ie

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Haematology & Blood Transfusion		
Consultant Haematologist	Dr. Patrick Thornton	5322 / Switch patrick.thornton@hse.ie
Consultant Haematologist	Dr. John Quinn	5322 / Switch johnquinn@beaumont.ie
Haematology Registrar		Bleep 294 / Switch
Chief Medical Scientist	Ms. Maeve Marren	5366 maeve.marren@hse.ie
Senior Medical Scientist Haematology	Ms. Theresa King	5326 theresa.king@hse.ie
Senior Medical Scientist Blood Transfusion	Ms. Marian Lynch	5302 marian.lynchl@hse.ie
A/Senior Medical Scientist Blood Transfusion	Ms. Jessica McCarthy	5302 jessica.mccarthy1@hse.ie
A/Quality Officer	Ms. Niamh Durcan	7974734 niamhdurcan@beaumont.ie
Haemovigilance Officers	Ms. Gretta Boyle	5307 / Bleep 258 gretta.boyle@hse.ie
	Ms. Cathy Matthews	5307 / Bleep 258 haemovigilance.jcm@hse.ie
Histopathology		
Consultant Histopathologist	Dr. Eamon Leen	5397 eamon.leen@hse.ie
Consultant Histopathologist	Dr. Muna Sabah	5398 / Switch muna.sabah@hse.ie
Consultant Histopathologist	Dr. Iqdam Tobbia	5327 / Switch iqdam.tobbia@hse.ie
Histopathology Registrar		5395
Chief Medical Scientist	Mr. Jimmy Conheady	5339 histology@hse.ie
Senior Medical Scientist	Mr. Shay Caffrey	5304 histology@hse.ie
Microbiology		
Consultant Microbiologist	Dr. Anne Gilleece	5396 / Switch anne.gilleece1@hse.ie
Consultant Microbiologist	Dr. Eoghan O'Neill	anne.gilleece@rcsi.ie eoneill@rcsi.ie
Chief Medical Scientist	Ms. Liz Ward	5368 liz.ward@hse.ie
Senior Medical Scientists	Ms. Ann Foley	5303 ann.foley1@hse.ie
	Ms. Jennifer McGarry	5303 jennifer.mcgarry@hse.ie
A/Senior Medical Scientist	Ms. Grainne O'Dea	5303 grainne.odea@hse.ie
Infection Control Nurse Specialists	Ms. Jane Murphy	5372 / Bleep 191 jane.murphy@hse.ie
	Ms. Marie Anne Bruno	5374 / Bleep 270 marieanne.bruno@hse.ie
Surveillance Scientist	Ms. Grainne Bowens	5376 grainne.bowens@hse.ie

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5 SPECIMEN RECEPTION

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

- Reception of samples from porters, attendants, pneumatic tube system etc.
- Reception of goods inwards.
- Supply of swabs, blood culture bottles, CSF containers and specimen bags.

All laboratory request forms, blood bottles and needles can be obtained from the Materials Management Department.

6 ORDERING LABORATORY EXAMINATIONS

6.1 Request Form and Specimen Labelling

The criteria for sample acceptance, as described below, are strictly adhered to in order to comply with accreditation standards and in the interest of patient safety. Failure to provide the required data shall lead to rejection of the specimen and request form. Laboratory personnel are acting correctly when they take action to ensure that the minimum standards set out in this policy are met at all times.

6.1.1 *Clinical Biochemistry, Haematology, Histopathology and Microbiology Labelling Requirements*

<i>Clinical Biochemistry, Haematology, Histopathology and Microbiology</i>		
Labelling Requirements	Essential Information[§]	Desirable Information
Specimen * Details must be identical on form and specimen	Patient's full name* Hospital number (MRN) and / or date of birth*	Date and time of specimen collection Location (ward) Signature of venipuncturist
Request Form * Details must be identical on form and specimen	Patient's full name* Hospital number (MRN) and / or date of birth* Name of requesting clinician or destination for report Test request	Gender Consultant or GP Bleep No. or Contact No. Patient's address Clinical details & relevant therapy (antibiotic treatment important for Microbiology) Date and time of specimen collection (timing in relation to antibiotic dose essential for Antibiotic Assays & for some Biochemistry tests)
Specimen / Request Form	Specimen type or exact site (for all non-blood biological samples)	
Unidentified Patients	Where unique identification is not available (i.e. patient unconscious or confused on arrival in the hospital), the patient is assigned an 'unknown' name and MRN in A/E. This is used to register the patient on the LIS. If the patient's DOB is unknown, the default DOB 01-01-1900 is used.	

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§Where essential information is omitted or incorrect, requests will be processed but reports withheld until essential information is obtained.

6.1.2 *Blood Transfusion Labelling Requirements – 3 Identifiers Available (Full name, HRN & DOB)*

Note: The Blood Transfusion service is not available for GP patients.

<i>Blood Transfusion</i>		
<i>3 Identifiers Available (full name, DOB, MRN)</i>		
Labelling Requirements	Essential Information	Desirable Information
Specimen Details must always be handwritten . The information must be identical to that on the patient's ID band. Addressograph labels are not permitted on pre-transfusion specimen bottles in any circumstances even if the details are also handwritten on the specimen bottle.	Surname / family name (correctly spelt) First name(s) (correctly spelt), no abbreviations Hospital Number Date of birth Signature of the person drawing the blood specimen	Ward Date and time sample was drawn
Request Form	Surname / family name (correctly spelt) First name(s) (correctly spelt), no abbreviations Hospital Number Date of birth Identity of the person taking the blood specimen	Gender Ward Consultant Contact number of person taking the blood sample Name, signature and bleep no. of requester Test required No. and type of blood component(s) / product(s) required Date and time required Date and time of sampling Indications for request Patient diagnosis Any special requirements e.g. CMV seronegative, gamma irradiated. Previous transfusion history Obstetric history
<i>3 Identifiers Not Available e.g. Unidentified Patients, PAS system downtime</i> <i>Form and specimen should be labelled with any available patient details</i>		
Specimen	Hospital Number Gender Typenex Blood Recipient Identification Number Signature of the person drawing the blood specimen	
Form	Hospital Number Gender Typenex Blood Recipient Identification Number Identity of the person taking the blood specimen	

Refer to section 12 Blood Transfusion for specific Blood Transfusion Request Form and specimen labelling requirements.

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6.1.3 *Unrepeatable Samples – Minimum Labelling Requirements Not Met*

In the event that minimum labelling requirements are not met for unrepeatable samples e.g. CSFs, tissue samples, blood cultures taken during temperature spike, certain fluids etc. the clinician taking responsibility for labelling the sample will be contacted and requested to come to the laboratory to resolve the labelling anomaly. The clinician taking responsibility for resolving the anomaly must sign the accompanying request form. Requests may be processed but reports withheld until the anomaly is resolved.

6.2 **Phlebotomy Services**

6.2.1 *Procedures for Ordering Phlebotomy for In-Patients*

Day	Service	Clinical Area	Cut-Off Time for Ordering Blood Tests
Monday to Friday	Routine	All wards (except ICU)	7:30 am*
	Additional	Laurel & Redwood	1:00 pm*
Saturday	Urgent Requests	Laurel, Redwood, Elm, Rowan, Cypress, CCU, Maple & Oak	7:30 am*

*Staff placing orders after this time must be aware they will not be collected until the next day.

1. Request forms must contain minimum details as described in section 6.1 of this document.
2. If using PAS addressograph labels remember to put the addressograph labels on all copies of the request form. If necessary change the location and requesting clinician on the addressograph label.
3. All request forms must be left at the agreed location on each ward, usually in a box at the nursing station.
4. **If the request is urgent, please state clearly on the request form and it will be given priority. Urgent requests should also be communicated to the relevant laboratory by telephone.**
5. If the patient is unavailable for phlebotomy, or the phlebotomist is unable to obtain a sample, the phlebotomist will contact the relevant medical team. The relevant team will then decide whether to leave the request until the next day, or to take the sample themselves.

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6. When ordering fasting blood tests or other tests that require patient preparation, **please state ‘fasting’ clearly on the request form and ensure that the patient and nursing staff are informed.**

6.2.2 Procedures for Ordering Phlebotomy for Out-Patients

1. Request forms must contain minimum details as described in section 6.1 of this document.
2. If using PAS addressograph labels remember to put the addressograph labels on all copies of the request form. If necessary change the location and requesting clinician on the addressograph label.
3. **If the request is urgent, please state clearly on the request form and it will be given priority. Urgent requests should also be communicated to the relevant laboratory by telephone.**
4. When ordering fasting blood tests **please state ‘fasting’ clearly on the request form and inform the patient**, taking cognisance of the insulin dependent diabetic.

6.2.3 Procedures for Ordering Phlebotomy for Non-Hospital Patients / GP Patients

1. All non-hospital patient / GP patient requests must be made on the Connolly Hospital GP Request Form.
2. Request forms must contain minimum details as described in section 6.1 of this document.
3. When ordering fasting blood tests **please state fasting clearly on the request form and inform the patient**, taking cognisance of the insulin dependent diabetic.

7 SPECIMEN COLLECTION

7.1 General Guidelines

Refer to the sections 11 to 15 of this manual for lists of tests performed. Specimens for some tests must be collected with the patient fasting, in the basal state or with due regard to diurnal variations. Some tests may be performed only after prior arrangement with the laboratory. If in doubt contact the relevant laboratory.

7.2 Personnel Responsible for Primary Specimen Collection








- Phlebotomists, NCHDs, nursing staff in specialist areas, general practitioners and practice nurses are responsible for blood specimen collection.
- Clinical staff are responsible for tissue and fluid specimen collection within Connolly Hospital.

- Urine and faecal sample collection may be performed by the patient.

7.3 Specimen Containers

Please note the images below do not reflect the actual size of the containers.

7.2.1 Blood Containers and Order of Draw

ORDER	COLOUR	INVESTIGATION
1 SERUM (WHITE) 7.5ML		RENAL(UEC) PROFILE, LI VER(LFT) PROFILE, BONE PROFILE, LIPIDS, MAGNESIUM(MG), LITHIUM, TNL CK, CRP, IRON, TIBC, URATE, AMYLASE, TFT, FT3, FERRITIN, B12, FOLATE, FSH, LH, OESTRADIOL, PROLACTIN, TESTOSTERONE, PROGESTERONE, SHBG, DHEAS, CORTISOL, PSA, TUMOUR MARKERS, SPE, IGA, IGG, IGM, IGE, DRUG SCREEN, ALPHA-1-ANTITRYPSIN, ACE, DIGOXIN, VALPROATE, PHENYTOIN, PHENOBARBITONE, CARBAMAZEPINE, HEP SCREEN, HAPTOGLOBIN, ALDOSTERONE*, PTH*, VITAMIN D* * SAMPLES MUST BE ON ICE
2 COAGULATION (GREEN) 3ML		COAGULATION SCREEN (PT APTT) INR, FIBRINOGEN, D-DIMER – [ALL PERFORMED ON ONE SAMPLE] THROMBOPHILIA SCREEN – [6 Tubes Required] LUPUS SCREEN – [4 Tubes required] FACTOR ASSAYS – [6 Tubes Required] VON WILLIBRANDS FACTOR – [6 Tubes Required] HLA B27 – [10ML Tube Required] UNDERFILLED OR OVERFILLED SAMPLES WILL BE REJECTED
3 LITHIUM HEPARIN (ORANGE) 7.5ML		VITAMIN A, VITAMIN C, VITAMIN B2-ALL SAMPLES MUST BE LIGHT PROTECTED. KARYOTYPE
4 LH-TRACE METAL ANALYSIS (ORANGE) 7.5ML		METAL ANALYSIS IN A SPECIAL METAL FREE TUBE USING A METAL FREE NEEDLE.
5 7.5 ML EDTA BLOOD TRANSFUSION (RED)		GROUP & SCREEN GROUP & CROSSMATCH
6 2.7 ML EDTA (RED)		FBC, ESR, BLOOD FILM, RETICULOCYTE COUNT, MONOSPOT, MALARIA SCREEN, HAEMOLYTIC SCREEN, SICKLE CELL TEST, HAEMOGLOBINOPATHY SCREEN, DIRECT COOMBS TEST, RENIN*, ACTH*, CYCLOSPORIN A, TACROLIMUS, MOLECULAR ANALYSIS, HBA1C - [MUST HAVE DEDICATED TUBE] HAEMOCHROMOTOSIS SCREEN – [MUST HAVE DEDICATED TUBE] *SAMPLES MUST BE ON ICE
7 2.7 ML SODIUM FLUORIDE (YELLOW)		GLUCOSE, ETHANOL(ALCOHOL), LACTATE

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3 ml Heparin Coated Syringe for Arterial Blood Gas - for sampling from arterial line



Biochemistry Arterial blood gas. Mix well by inverting tube 4-5 times. Must be labelled as per criteria in 6.1.1. Analyse immediately in ICU or ED or send to laboratory immediately on **ice**.

10ml GREEN Tube for HLA Typing



Blood Transfusion HLA Typing - sample tubes are available from the Laboratory.

7.2.2 Swab Types

Virus Transport PINK Swab



Microbiology Swabs for Virology

General Transport BLACK Swab



Microbiology Swabs for Routine Culture or MRSA screening

Aptima Unisex Swab Collection Kit for Chlamydia



Microbiology Endocervical and Male Urethral Swabs for Chlamydia

7.2.3 Urine, Fluid and Biopsy Containers

Plain 24Hr Urine Container



Biochemistry

Bence Jones Protein, Calcium, Citrate, Copper, Cortisol, Creatinine Clearance, Electrophoresis, Iron, Lead, Magnesium, Mercury, Phosphate, Potassium, Protein, Sodium, Thallium, Urate, Urea, Zinc.

Acid 24Hr Urine Container



Biochemistry

Catecholamines, 5HIAA, HMMA, Homovanillic acid, Oxalate, Serotonin.

Yellow MSU Container (Sterile)



Biochemistry

Spot Urines – Albumin / Creatinine Ratio, Amino Acid Screen, Amylase, Drug Screen, Glucose, Microalbumin, Organic Acids, Osmolality.

Fluids

Microbiology

Urine, Faeces, Fluids, Sputum, Tips, Tissue

Sterile Universal Container



Microbiology

CSF, Fluids

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Blood Culture Bottles



Microbiology CSF, Fluids

60ml Container; 10% Buffered Formalin



Histopathology Biopsies and small Histopathology samples

200ml Container



Histopathology Large Histopathology samples

Large White Plastic Containers



Histopathology Large Histopathology samples

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7.3 Phlebotomy

7.3.1 *Fasting Blood Specimens*

Food and drink not allowed except for water and prescribed medication if required. Patients are required to fast for **8 hours** prior to sampling for fasting glucose or GTT and / or 12 hours for fasting lipid profile.

7.3.2 *Order of Draw of Samples*

Refer to section 7.2.1.

7.3.3 *Patient Identification*

1. Check that the patient is wearing an ID band. Patients who can communicate must be asked to state their surname, first name and date of birth.
2. If the patient is not wearing an ID band or there are discrepancies between the information on the ID band and the information from the patient or healthcare record **DO NOT PROCEED** with specimen collection until a correct ID band is applied.

Ref: Connolly Hospital Policy on Patient Identification.

3. For the collection of pre-transfusion specimens in emergency situations refer to Haemovigilance procedures on using Typenex Identification band.

Ref.: WI-HV-0005 Unidentified Patient Policy

7.3.4 *Venipuncture Procedure*

1. Ensure gloves are changed and hands are washed with gel / wash between each patient.
2. Assemble all equipment e.g. needles, sample tubes, request forms, tourniquet and sharp's container, the needle, the necessary blood tubes, gloves, cotton swabs or gauze dressings.
3. Introduce oneself to the patient, explain the procedure, seek consent for procedure and reassure the patient.
4. Positively identify the patient with requisition form.
5. Ensure the patient is positioned safely so he / she will not fall in the event of fainting.
6. Verify any patient diet requirements e.g. confirm that the patient is fasting if a fasting specimen is required.
7. Position the patient comfortably e.g. pillow supporting arm.
8. Verify request forms and sample tubes.

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9. Select vein (preferably anti-cubital fossa). It is recommended where possible to take the sample from an alternative limb to the one where fluids are infusing (NBUG 2004). If the sample must be taken from the same limb, stopping the infusion before taking the sample and choosing a vein distal to the infusion is recommended.
10. Apply tourniquet. Allow time for vein to stand - palpate if necessary. Avoid use of tourniquet for more than 2 minutes as prolonged use can alter test results as well as causing discomfort to patients (Ionised calcium to be taken without a tourniquet).
11. Perform venipuncture, inserting needle with bevel edge upwards.
12. Withdraw blood samples. Release tourniquet before removing needle from vein to avoid haematoma formation, when task is almost complete.
13. When all samples are obtained, place a clean swab / gauze on venipuncture site and remove needle and place in the sharps container
14. Do not flex patients arm after venipuncture. Ask patient to apply pressure on swab/gauze at puncture site for a couple of minutes.
15. Mix specimens by gently inverting two to three times.
16. Do not make more than two attempts to draw blood. Use a sterile needle on each attempt. In the event that the phlebotomy department have been unsuccessful withdrawing the blood from the patient, inform the clinical nurse manager and return the request form.
17. Do not draw blood from in-dwelling lines or cannulae unless one is trained and authorised.
18. 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 5 minutes minimum to allow for venipuncture to take place. Advise staff when procedure has been completed. Do not perform venipuncture on a limb which is paralysed or on a limb with evidence of oedema or where surgery on axillary lymph nodes has taken place e.g. mastectomy. Do not perform venipuncture above or below a renal fistula.
19. Label specimen tubes using clear writing as described in Section 6.1 of this document.
Specimen tubes must not be labelled prior to venipuncture.
20. Check venipuncture site and apply tape to hold swab / gauze in position.
21. Reassure patient and leave comfortable.

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7.4 24 Hr Urine Collections

7.4.1 Specimen Requirements

Test Required	24 Hour Urine Containers			Spot Urine
	Plain	Acid	Light Protected (with tinfoil)	
Albumin/Creatinine Ratio				Yes
Amino Acid Screen				Yes
Amylase				Yes
Bence Jones Protein (BJP)	Yes			
Calcium	Yes			
Catecholamines		Yes		
Citrate	Yes + Refrigerate during collection			
Copper	Yes			
Cortisol	Yes			
Creatinine Clearance	Yes			
Drug Screen				Yes
Electrophoresis	Yes			
Glucose				Yes
5HIAA		Yes		
Homovanillic acid		Yes		
Hydroxyproline (total)				EMU/ Fasting + Diet Restrictions
Iron	Yes			
Lead	Yes			
Magnesium	Yes			
Mercury	Yes			
Microalbumin				Yes
Organic Acids (freeze)				Yes
Osmolality				Yes
Oxalate		Yes		
Phosphate	Yes			
Porphyrins			Yes + Refrigerate during collection	
Porphobilinogen				
Potassium	Yes			
Protein	Yes			
Sodium	Yes			
Serotonin		Yes + Diet Restrictions		
Thallium	Yes			
Urate	Yes			
Urea	Yes			
Zinc	Yes			

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7.4.2 *Specimen Collection -Instructions for Patients*

Approved containers for the collection of 24 Hr-urine are available from the hospital stores department. Depending on the test requested the container may need an acid preservative added or may need to be light protected as per section 7.4.1. Do not discard this acid preservative.

1. Just before the timed collection period is due to start the patient should empty his / her bladder. *This urine must be discarded.*
2. Thereafter, from the start (e.g. at 8am) until the end of the collection period, all urine passed must be added to the container. It is very important that the patient collect all urine passed within an exact 24 hour period. Loss of any urine, or a collection made for either more or less than 24 hours, will invalidate the test and might lead to an incorrect diagnosis.
3. Patients should be cautioned not to urinate directly into a bottle containing acid preservative but into a suitable clean detergent-free jug and then pour into the 24 hour container.
4. If the specimen container contains preservative, it must be mixed gently each time more urine is added to the collection. Ensure the cap is tightened while mixing.
5. At the end of the timed period (e.g. 8am the next day) the patient should empty his / her bladder. *This urine must be included in the timed collection.*
6. The period over which the collection was made must be recorded on the container label. If a second container is used ensure each is fully labelled and that the containers are labelled '1 of 2' and '2 of 2'.
7. The container should be stored in a cool environment during urine collection.
8. Ensure that the identification label on the container is completed.
9. The container should be brought to the laboratory on the day the collection is completed.

Important Note: Hydrochloric Acid (fuming liquid) causes burns and is irritating to eyes, skin and respiratory system. If in contact with skin, wash immediately with plenty of water and seek medical advice. Keep out of reach of children.

7.5 **Mid Stream Urine (MSU) Collection - Instructions for Patients**

Specimen containers are available from the clinical area or general practitioner.

The aim of collecting a mid stream urine sample is to establish if the patient has a urinary tract infection (UTI). A 'mid-stream' sample is the best sample as the first void of urine passed may be contaminated with bacteria from the skin.

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1. The container should be labelled with the patient's full name, date of birth, date / time of collection and the referring doctor's name.
2. The sterile container should not be opened until the patient is ready to collect the sample.
3. The patient should pass some urine into the toilet, then without stopping the flow of urine, catch some urine in the sterile container (approximately half full). The patient should then finish passing urine into the toilet.
4. The patient should ensure that the lid of the container is firmly closed and place the container into the specimen bag attached to the pathology request form. The request form should be labelled with the patient's full name, date of birth, date / time of collection, ward / patient's address and the referring doctor's name.
5. Specimens should ideally be brought to the doctor's surgery or laboratory within 2 hours of collection. If that is not possible the sample should be refrigerated until it can be brought to the doctor's surgery or laboratory.

7.6 Faeces / Stool Sample Collection – Instructions for Patients

Specimen containers are available from the clinical area or general practitioner.

1. The container should be labelled with the patient's full name, date of birth, date / time of collection and the referring doctor's name.
2. The sterile container should not be opened until the patient is ready to collect the sample.
3. Faeces (a bowel movement) should be collected in the container. It is not necessary to fill the container.
4. The patient should ensure that the lid of the container is firmly closed and place the container into the specimen bag attach to the pathology request form. The request form should be labelled with the patient's full name, date of birth, date / time of collection, ward / patient's address and the referring doctor's name.
5. Specimens should be brought to the laboratory as soon as possible.

8 TRANSPORT OF SPECIMENS TO THE LABORATORY

8.1 Packaging

1. The primary container containing the specimen for examination is placed in a biohazard bag, attached to the request form, which is sealed carefully.
2. The person who sends the specimen ensures that the primary container is appropriate, properly closed and is not externally contaminated by the contents.

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3. The secondary sealed biohazard bag and transportation container prevents the contamination of other containers, request forms, the hands of the specimen receptionist and the immediate environment.
4. All unnecessary hand contact with the specimen containers should be limited.

8.2 Specimens From Within Connolly Hospital

8.2.1 Transport Personnel / Portering Service

Request forms and attached biohazard bags must be placed in CHB Laboratory Specimens Transport Bags or in a transport box.

Transport Personnel collect specimens from designated locations in the clinical areas on Monday to Friday at 8:30am.

Specimens are collected by Porters from OPD and Unit 8E at the following times:

Monday		Tuesday		Wednesday		Thursday		Friday	
OPD	Lab	OPD	Lab	OPD	Lab	OPD	Lab	OPD	Lab
9:00	9:20	9:00	9:20	9:00	9:20	9:00	9:20	9:00	9:20
10:00	10:20	10:00	10:20	10:00	10:20	10:00	10:20	10:00	10:20
11:00	11:20	11:00	11:20	11:00	11:20	11:00	11:20	11:00	11:20
12:00	12:20	12:00	12:20	12:00	12:20	12:00	12:20	12:00	12:20
13:00	13:20	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
14:00	14:20	14:00	14:20	14:00	14:20	14:00	14:20	14:00	14:20
15:00	15:20	15:00	15:20	15:00	15:20	15:00	15:20	15:30	15:50
16:30	16:35	16:30	16:35	16:30	16:35	16:30	16:35	N/A	N/A

Porters from other clinical areas collect specimens from designated locations at regular intervals.

8.2.2 Pneumatic Tube System (PTS)

The pneumatic tube system (PTS) is used to transport samples from A/E, Theatre and the wards in the main hospital building. All current blood collection tubes and universal containers are suitable for transport in the PTS.

The following sample types are **never** sent via the PTS:

- Any containers containing over 100ml fluid
- Arterial blood gas samples
- CSF samples
- Histology or Cytology samples

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- Blood Components or Products

All specimens are sealed in the bag attached to the request form before loading into the pneumatic tube canister. All urine samples must have a spill absorbent pad in the bag.

Brief operating instructions are located on laminated cards WI-GEN-0001 at each PTS station.

Ref.: WI-GEN-0001 Operation of Pneumatic Tube System - Clinical Areas

8.2.3

8.3 Specimens From Outside Connolly Hospital

All specimens transported by road must comply with ADR transport regulations. Specimens should be packaged as per ADR P650 Packaging Instructions. It is the responsibility of the sender to ensure that specimens are transported in accordance with the ADR.

The Health Service Executive's (HSE) Primary, Community and Continuing Care (PCCC) service provides a specimen collection service from surrounding medical centres and practices.

8.4 Transport of Urgent Specimens

Requests for urgent processing of specimens must be communicated to the relevant laboratory, by phone during routine hours or pager 158 out of routine hours, to ensure the specimen is expected and testing of the specimen is prioritised. Urgent specimens can be transported to the laboratory by the following methods:

Origin	Method of Delivery
Connolly Hospital	<ol style="list-style-type: none"> 1. Pneumatic Tube System – with the exception of those specimens detailed in section 8.2.2. 2. Porters 3. Healthcare Attendants 4. Clinical Staff 5. Transport Personnel – Outside routine hours
General Practitioners / External Locations	Specimens should be hand delivered to laboratory staff.

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9 REPORTING OF RESULTS

9.1 Laboratory Information System

Blood Transfusion results are available on the Laboratory Information system (Telepath). Information regarding availability of blood components and products are available from the Blood Transfusion Laboratory.

Histology and Cytology results are available from the Laboratory Office.

Results are available for Biochemistry, Endocrinology, Haematology and Microbiology on the Laboratory Information system (Telepath) as soon as they are authorised in the laboratory.

9.2 Printed Reports

Printed laboratory reports collected by portering staff for delivery to clinical areas twice daily Monday to Friday at 14:00 and 17:00.

9.3 Telephoned Results

Results are telephoned when:

- Previously arranged, e.g. on “Urgent” samples with prior verbal notification;
- Asked to do so on the request form;
- Results may be of relevance to immediate clinical management.

There is a procedure in place to ensure clear and unambiguous results reach an authorised receiver. Results provided verbally are followed by a formal hardcopy report.

Faxed reports are sent only in medical emergencies where there is no alternative and where the recipient is waiting to receive the fax.

9.4 Results from Referral Laboratories

It is the responsibility of the referring laboratory in Connolly Hospital to ensure that referral laboratory results and findings are provided to the service user.

It is the responsibility of the requesting doctor to contact the referral centre if clarification of results or further advice is required.

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9.5 Critical Values

Department	Test	Result
Biochemistry	Sodium	<130mmol/L or >150mmol/L
	Potassium	<3.0mmol/L or >5.5mmol/L serum or >5.2mmol/L Li-Hep
	Urea and Creatinine	Urea>10mmol/L if Creatinine <150µmol/L A significant increase from previous result e.g. Normal to 20mmol/L for urea Normal to 250umol/L for creatinine
	Calcium (corrected for albumin)	<1.90mmol/L or >3.0mmol/L
	Glucose	<3.0mmol/L or >15.0mmol/L
	Amylase	>300U/L
	Magnesium	<0.5mmol/L or >1.5mmol/L
	Inorganic Phosphate	<0.5mmol/L or >3.0mmol/L
	Protein	>100g/L
	Lithium	>1.2mmol/L
	Lactate	>4.0mmol/L
	Paracetamol	All results
	Troponin	>0.034ng/ml
	Vitamin B12	<150 pmol/L
	Free T4	>45 pmol/L
	TSH	>75 mU/L
Blood Transfusion	Antibody Screen	Positive
Histopathology	Frozen Sections	All results
Microbiology	Blood Culture	Positive – Consultant Microbiologist informed
	CSF	Negative – Team phoned Positive – Consultant Microbiologist informed
	HCG	Positive
	Antibiotic Assay	Abnormal results
	C. difficile	Positive – Infection Prevention & Control Team notified.
	MRSA	Positive - Infection Prevention & Control Team notified.
	VRE	Positive - Infection Prevention & Control Team notified
	Others	All clinically significant results.

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Department	Test	Result
Haematology	Haemoglobin (Hb)	sudden decrease <8.0g/dL – initial presentation
	Platelets	<100x10 ⁹ /L – initial presentation
	WBC	>25x10 ⁹ /L – initial presentation
	Neutrophils	<1.0x10 ⁹ /L – initial presentation
	Lymphocytes	>6.0x10 ⁹ /L – initial presentation
	Sickledex	Positive
	Monospot	Positive
	Malaria Screen	Positive
	INR	<1.5 or >5.0 – patient on warfarin >1.5 – patient not on warfarin
	APTT	>39 secs - patient not on heparin / initial presentation
	Derived Fibrinogen	<1.0g/L
	D-Dimer	>1000 ng/ml

9.6 Clinical Advice and Interpretation

Medical Scientists with appropriate training are responsible for technical advice. The Haematology, Histopathology and Microbiology medical teams are responsible for the provision of clinical advice.

Haemovigilance Officers are responsible for the provision of advice on blood component / product administration, traceability and reporting and investigating Serious Adverse Reactions (SAR) and Serious Adverse Events (SAE).

Infection Control Nurse Specialists are responsible for the provision of infection control advice.

10 ON-CALL SERVICE

Emergency service is available outside of routine working hours for Biochemistry, Blood Transfusion, Haematology and Microbiology. This service is restricted to true emergencies. No emergency service is available for Endocrinology or Histopathology.

Bleep 258	
Monday to Friday	20:00 to 08:00 following day (Monday to Thursday)
Saturday	13:00 to 09:00 following day
Sunday / Bank Holiday	09:00 to 08:00 following day

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10.1 Tests Available On-Call

Biochemistry * Require consultation with referral laboratory	ABG Renal Profile LFT Profile Bone Profile Glucose Lactate Magnesium Lithium Troponin Amylase CPK AST LDH Iron-suspected overdose Urate Urinary Amylase Urinary Electrolytes Urinary Urea Urinary Creatinine Fluid pH CSF Glucose CSF Protein Paracetamol Carboxy Haemoglobin* Methaemoglobin Levels* Therapeutic Drugs*
Blood Transfusion * Requires authorisation by Haematology team	Group & Antibody Screen – from A/E and Theatre Only Group & Crossmatch – Urgent Requests Only Direct Coombs Test – Suspected Haemolysis Only* Transfusion Reaction Investigation – if further RCC transfusion is required during on-call period only.
Haematology	Full Blood Count + Differential Prothrombin Time (PT) + INR APTT Derived Fibrinogen D-Dimer Infectious Mononucleosis Screen Malaria Screen Sickledex – Patients going for emergency theatre Only. Erythrocyte Sedimentation Rate (ESR) – Suspected Temporal Arthritis Only
Microbiology	CSF – Microbiology Laboratory must be notified in advance Urine – Microscopy, Culture and / or HCG from A/E Only Virology – Urgent requests in cases of Organ Transplantation or Needlestick Injuries; require consultation with Consultant Microbiologist

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11 CLINICAL BIOCHEMISTRY

11.1 Introduction

The Department of Clinical Biochemistry provides a clinical laboratory service in the areas of core clinical biochemistry and endocrinology. Specimens received for examinations not performed by the Clinical Biochemistry laboratory in Connolly Hospital are referred to the appropriate external laboratory for analysis.

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11.2 Specimen Requirements

Examination	Specimen Type	Analysing Laboratory	When Available	Turnaround Time
A Glycoprotein	1 x 7.5ml Plain Tube - Peripheral Blood	SJH - Biochemistry	Routine Hours	
A1 Anti-Trypsin	1 x 7.5ml Plain Tube - Peripheral Blood	Dept of Respiratory Med RCSI Beaumont	Routine Hours	
ACE (Angiotensin Converting Enzyme)	1 x 7.5ml Plain Tube - Peripheral Blood	SJH - Biochemistry	Routine Hours	
ACTH	2 x 2.7ml EDTA - Peripheral Blood. Send down immediately	SJH - Endocrinology	Routine Hours	
ACR (Albumin Creatinine Ratio)	Spot Urine	Beaumont - Renal Biochemistry	Routine Hours	
Adenosine d-Aminase	1 x 7.5ml Plain Tube - Peripheral Blood	Claymon	Routine Hours Monday-Wednesday only	
Adenosine d-Aminase (Pleural Fluid)	Pleural Fluid Mon-Wed only	St Thomas' Hospital, London	Routine Hours Monday to Wednesday Only	
Adrenaline	24Hr Urine with acid added	Beaumont - HPLC Biochemistry	Routine Hours	
AFP (Alpha Feto Protein)	1 x 7.5ml Plain Tube - Peripheral Blood	Claymon	Routine Hours	
delta-ALA (Aminolevulinic Acid)	See Porphyrin Screen		Routine Hours	
Albumin (included in Bone Profile)	1 x 7.5ml Plain Tube - Peripheral Blood	Connolly - Biochemistry	Routine & On-Call Hours	
Albumin / Creatinine Ratio	Spot Urine	Connolly - Biochemistry	Routine Hours	
Alcohol (Ethanol)	1 x 2.6ml Fluoride Tube - Peripheral Blood and / or Spot Urine	Beaumont - Toxicology	Routine Hours. On-Call - requires consultation with Beaumont	
Aldolase	Assay no longer available. Do CPK + AST	N/A	N/A	N/A

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Examination	Specimen Type	Analysing Laboratory	When Available	Turnaround Time
Aldosterone	1 x 7.5ml Plain Tube - Peripheral Blood on ice Send down immediately	SJH- Endocrinology	Routine Hours	
Alkaline Phosphatase (included in LFT or Bone Profile)	1 x 7.5ml Plain Tube - Peripheral Blood	Connolly - Biochemistry	Routine & On-Call Hours	
Alkaline Phosphatase Isoenzymes	1 x 7.5ml Plain Tube - Peripheral Blood Send down immediately	Claymon	Routine Hours	
ALT (included in LFT)	1 x 7.5ml Plain Tube - Peripheral Blood	Connolly - Biochemistry	Routine & On-Call Hours	
Aluminium	1 x 4.9ml Lithium Heparin Metal Free Tube* - Peripheral Blood; taken with metal free needle	Claymon	Routine	
Amino Acids	1 x 7.5ml Lithium Heparin - Peripheral Blood and / or Spot Urine	Temple Street – Biochemistry	Routine	
Aminophyllin (Theophylline)	1 x 7.5ml Plain Tube - Peripheral Blood	Beaumont – TDM	Routine On-Call – requires consultation with Beaumont	
Ammonia	1 x 7.5ml Lithium Heparin*. Send down immediately. Need a control specimen from person with normal LFT + non smoker taken at same time.	Temple Street – Biochemistry	Routine	
Amylase	1 x 7.5ml Plain Tube - Peripheral Blood and / or Spot Urine	Connolly – Biochemistry	Routine & On Call Hours	
Androgens FSH, LH,	2 x 7.5ml Plain Tube - Peripheral Blood	FSH + LH done in Connolly – Endocrinology DHEAS, Testosterone Androstenedione SJH - Endocrinology	Routine Hours	48 hrs
DHEAS, Androstenedione, Testosterone				

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Examination	Specimen Type	Analysing Laboratory	When Available	Turnaround Time
Androstenedione	1 x 7.5ml Plain Tube - Peripheral Blood	SJH - Endocrinology	Routine Hours	
Antibiotic Assays	1 x 7.5ml Plain Tube - Peripheral Blood See antibiotic guidelines re: timing of samples in relation to administration of dose. State time of sampling, details of last does and whether sample is a trough or a peak.	Connolly - Biochemistry	Samples must be received in the laboratory before : 14.30 Monday- Friday 10.30 Saturday, Sunday and Public Holidays	
Anti Epileptic Drugs Valproate (Epilim) Carbamazepine (Tegretol) Phenytoin (Epanutin) Phenobarbitone	1 x 7.5ml Plain Tube - Peripheral Blood	Beaumont - TDM	Routine Hours On-Call - requires consultation with Beaumont	
Arterial Blood Gas (ABG)	1 x 3ml Air-Free Heparinised Syringe. Labelled + on ice. Do not send in PTS.	Connolly - Biochemistry	Routine & On-Call Hours	20 mins
AST	1 x 7.5ml Plain Tube - Peripheral Blood	Connolly - Biochemistry	Routine & On-Call Hours	
Azathioprine (Imuger, Imuran)	2 x 7.5ml Lithium Heparin* Send down immediately. Mon-Wed only	Claymon	Routine Hours Monday to Wednesday Only.	
Base Excess (included in ABG)	1 x 3ml Air-Free Heparinised Syringe. Labelled + on ice. Do not send in PTS.	Connolly - Biochemistry	Routine & On-Call Hours	20 mins
Barbiturates	1 x 7.5ml Plain Tube - Peripheral Blood	Beaumont - Toxicology	Routine Hours	
Bence Jones Protein (BJP)	Plain 24 Hr Urine	Beaumont - Protein Separation	Routine Hours	
Benzodiazepine	1 x 7.5ml Plain Tube - Peripheral Blood	Beaumont - Toxicology	Routine Hours	
Beta hCG	1 x 7.5ml Plain Tube - Peripheral Blood	SJH - Endocrinology	Routine Hours	
Beta Hydroxybutyrate	1 x 2.6 ml Fluoride Tube - Peripheral Blood on ice	Sheffield	Routine Hours	
Beta-2-Microglobulin	1 x 7.5ml Plain Tube - Peripheral Blood	Beaumont	Routine Hours	
Bilirubin Direct (Conjugated)	1 x 7.5ml Plain Tube - Peripheral Blood	Connolly - Biochemistry	Routine Hours	

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Examination	Specimen Type	Analysing Laboratory	When Available	Turnaround Time
Bilirubin Total (included in LFT)	1 x 7.5ml Plain Tube - Peripheral Blood	Connolly - Biochemistry	Routine & On-Call Hours	
Bone Profile (Calcium, Phosphate, Alkaline Phosphatase, Protein, Albumin)	1 x 7.5ml Plain Tube - Peripheral Blood	Connolly - Biochemistry	Routine & On-Call Hours	
Brain Natriuretic Peptide (BNP)	1 x 2.7ml EDTA-Peripheral Blood. Send down immediately on ice.	Claymon	Routine Hours	
CA125	1 x 7.5ml Plain Tube - Peripheral Blood	Claymon	Routine Hours	
CA15.3	1 x 7.5ml Plain Tube - Peripheral Blood	Claymon	Routine Hours	
CA19.9	1 x 7.5ml Plain Tube - Peripheral Blood	Claymon	Routine Hours	
CA50	1 x 7.5ml Plain Tube - Peripheral Blood	Claymon	Routine Hours	
Caeruloplasmin	1 x 7.5ml Plain Tube - Peripheral Blood	SJH - Immunology	Routine Hours	
Calcitonin	1 x 7.5ml Plain Tube - Peripheral Blood	SJH - Endocrinology	Routine Hours	
Calcium (Serum) (included in Bone Profile)	1 x 7.5ml Plain Tube - Peripheral Blood	Connolly - Biochemistry	Routine & On-Call Hours	
Calcium (Urine)	Plain 24Hr Urine	Connolly - Biochemistry	Routine Hours	
Calcium, Ionised	Contact Biochemistry for details	Claymon	Routine Hours	
Calculi	Renal Stones	Claymon	Routine Hours	
Carbamazepine	1 x 7.5ml Plain Tube - Peripheral Blood	Beaumont	Routine Hours	
Carboxy Haemoglobin	1 x 2.7ml EDTA Tube - Peripheral Blood	Beaumont - Toxicology	Routine Hours On-Call - requires consultation with Beaumont	
Carcinoembryonic Antigen (CEA)	1 x 7.5ml Plain Tube - Peripheral Blood	Claymon	Routine Hours	
Cardiac Enzymes (CK)	1 x 7.5ml Plain Tube - Peripheral Blood	Connolly - Biochemistry	Routine & On-Call Hours	
Catecholamines	24Hr Urine with acid added	Beaumont - HPLC Biochemistry	Routine Hours	
Chloride	1 x 7.5ml Plain Tube - Peripheral Blood	Connolly - Biochemistry	Routine Hours & On-Call	
Cholesterol	1 x 7.5ml Plain Tube - Peripheral Blood	Connolly - Biochemistry	Routine Hours	
Cholinesterase Inhibitor	1 x 7.5ml Plain Tube - Peripheral Blood	SJH - Immunology	Routine Hours	

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Examination	Specimen Type	Analysing Laboratory	When Available	Turnaround Time
Chromogranin A	Contact Biochemistry for details	SJH - Biochemistry	Routine Hours	
Citrate - Urine	Plain 24 Hr Urine - must be refrigerated during collection	Claymon	Routine Hours	
CKMB	1 x 7.5ml Plain Tube - Peripheral Blood	Connolly - Biochemistry	Routine & On-Call Hours	
Copper (Urine)	Plain 24 Hr Urine Container	Claymon	Routine Hours	
Copper (Serum)	1 x 4.9ml Lithium Heparin Metal Free Tube* - Peripheral Blood; taken with metal free needle.	Claymon	Routine Hours	
Cortisol (Serum)	1 x 7.5ml Plain Tube - Peripheral Blood	Connolly - Endocrinology	Routine Hours	48 hrs
Cortisol (Urine)	Plain 24 Hr Urine Container	Claymon	Routine Hours	
C-Peptide	1 x 7.5ml Plain Tube - Peripheral Blood. Send down immediately	SJH - Endocrinology	Routine Hours	
Creatine Kinase (CK)	1 x 7.5ml Plain Tube - Peripheral Blood	Connolly - Biochemistry	Routine & On-Call Hours	
Creatine Kinase – MB (CK-MB)	1 x 7.5ml Plain Tube - Peripheral Blood. On request only.	Connolly - Biochemistry	Routine & On-Call Hours	
Creatinine Clearance	Plain 24 Hr Container. Serum creatinine must be sent during 24 Hr Collection for calculation.	Connolly - Biochemistry	Routine Hours	
Creatinine (Serum) (included in Renal Profile)	1 x 7.5ml Plain Tube - Peripheral Blood	Connolly - Biochemistry	Routine & On-Call Hours	
Creatinine (Urine)	Spot Urine	Connolly - Biochemistry	Routine & On-Call Hours	
Cross Linked Collagen (CTX)	Contact Biochemistry for details. Part of a screen.	St. Vincent's - Metabolic Lab	Routine Hours	
CSF (cerebrospinal fluid) Biochemistry – Glucose + Protein	CSF - sample obtained from Connolly Microbiology	Connolly - Biochemistry	Routine & On-Call Hours	
Cryoglobulin	1 x 7.5ml Plain Tube - Peripheral Blood sent @ 37°C	Connolly - Biochemistry	Routine Hours	

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Examination	Specimen Type	Analysing Laboratory	When Available	Turnaround Time
Cyclosporine	1 x 2.7ml EDTA	Beaumont	Routine Hours	
Cystic Fibrosis Genotyping	2 x 2.7ml EDTA. Send down immediately.	OLHSC – Genetics / LabLink	Routine Hours Monday to Thursday Only.	
Delta 508	Crumlin Patient form to be completed.			
Digoxin	1 x 7.5ml Plain Tube - Peripheral Blood	Beaumont - TDM	Routine Hours On-Call - requires consultation with Beaumont	
Dopamine	24 Hr Urine with acid added	Beaumont	Routine Hours	
Deoxyypyridinoline	Contact Biochemistry for details	Claymon	Routine Hours	
DHEAS	1 x 7.5ml Plain Tube - Peripheral Blood	SJH - Endocrinology	Routine Hours	
Drug Screen	1 x 7.5ml Plain Tube - Peripheral Blood 1 x 2.6ml Fluoride Tube - Peripheral Blood Spot Urine	Beaumont - Toxicology	Routine Hours	
Electrophoresis (Urine)	Plain 24Hr Urine	Beaumont – Protein Separation	Routine Hours	
Epanutin	1 x 7.5ml Plain Tube - Peripheral Blood	Beaumont - TDM	Routine Hours On-Call - requires consultation with Beaumont	
Epilim	1 x 7.5ml Plain Tube - Peripheral Blood	Beaumont - TDM	Routine Hours On-Call - requires consultation with Beaumont	
Erythrocyte Porphyrins	See Porphyrin Screen	SJH	Routine Hours	
Ethanol	1 x 2.6ml Fluoride Tube - Peripheral Blood and / or spot urine	Beaumont - Toxicology	Routine Hours On-Call - requires consultation with Beaumont	
Fabrys Disease	2 x 2.7ml EDTA	Royal Manchester Hospital - Willink Biochemical Unit	Routine Hours Monday to Wednesday Only.	
Faecal Elastase	Random Faeces	SJH - Biochemistry	Routine Hours	

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Familial Adenomatous Polyposis Coli (FAP)	2 x 2.7ml EDTA Send down immediately.	OLCHC – Genetics / Lab Link	Routine Hours Monday to Thursday Only.	
FK506	1 x 2.7ml EDTA	Beaumont	Routine Hours	
Flecainide	1 x 7.5ml Plain Tube - Peripheral Blood. Send down immediately	Claymon	Routine Hours	
Fluid Biochemistry - Glucose	1 x 2.6 ml Fluoride Tube - Peripheral Blood	Connolly - Biochemistry		
Fluid Biochemistry - LDH, Protein	1 x 7.5ml Plain Tube - Peripheral Blood	Connolly - Biochemistry		
Fluid Biochemistry - pH	1 x 3ml Air Free Heparinised Syringe. Labelled. Send down immediately.	Connolly - Biochemistry	Routine & On-Call Hours	
Fragile X	1 x 7.5ml Lithium Heparin* + 2 x 2.7ml EDTA. Send down immediately.	OLCHC – Genetics / Lab-Link	Routine Hours Monday to Thursday Only.	
Free T3	1 x 7.5ml Plain Tube - Peripheral Blood	Connolly - Biochemistry	Routine Hours	
Frisium (Benzodiazepine)	1 x 7.5ml Plain Tube - Peripheral Blood	Beaumont - Toxicology	Routine Hours On-Call - requires consultation with Beaumont Toxicology.	
Fructosamine	1 x 7.5ml Plain Tube - Peripheral Blood	Coombe - Biochemistry	Routine Hours	
FSH (Follicle Stimulating Hormone)	1 x 7.5ml Plain Tube - Peripheral Blood	Connolly - Endocrinology	Routine Hours	48 hrs
Furosemide	1 x 7.5ml Plain Tube - Peripheral Blood	Claymon	Routine Hours	
Gabapentin (Neurontin)	1 x 7.5ml Plain Tube - Peripheral Blood. Send down immediately	Claymon	Routine Hours	
Gastrin	1 x 7.5ml Plain Tube - Peripheral Blood on ice. Patient must be fasting 16 hrs. No water allowed.	SJH - Endocrinology	Routine Hours	
Growth Hormone	1 x 7.5ml Plain Tube - Peripheral Blood	SJH - Endocrinology	Routine Hours	
Glucagon	Contact Biochemistry for details	Claymon	Routine Hours	

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Gamma GT. Included in LFT	1 x 7.5ml Plain Tube - Peripheral Blood	Connolly - Biochemistry	Routine & On-Call Hours	
Glucose (Plasma)	1 x 2.6ml Fluoride Tube - Peripheral Blood	Connolly - Biochemistry	Routine & On-Call Hours	
Glucose (Urine)	Spot Urine	Connolly - Biochemistry	Routine Hours	
Glucose Tolerance Test	Fasting + 2Hr Post Prandial Glucose	Connolly - Biochemistry	Routine Hours	
5-Hydroxy-indole Acetic Acid (5HIAA)	24 Hr Urine with acid added.	Beaumont - HPLC Biochemistry	Routine Hours	
Haematinics (Iron, TIBC, Transferrin Saturation, Ferritin, B12, Folate)	2 x 7.5ml Plain Tube - Peripheral Blood	Connolly - Biochemistry + Endocrinology	Routine Hours	
HbA1C	1x 2.7ml EDTA	Connolly – Endo	Routine Hours	48 hrs
HDL Cholesterol (included as part of Lipid profile)	1 x 7.5ml Plain Tube - Peripheral Blood	Connolly - Biochemistry	Routine Hours	
Homocysteine	1 x 2.7ml EDTA on ice	SJH - Haematology	Routine Hours	
Homovanillic acid	24 Hr Urine with acid added.	Beaumont - HPLC	Routine Hours	
Hydroxyproline (Total)	Fasting Early Morning Urine. Diet restrictions. Send down immediately	Clayton	Routine Hours	
IgE	1 x 7.5ml Plain Tube - Peripheral Blood	SJH - Immunology	Routine Hours	
IGF1	1 x 7.5ml Plain Tube - Peripheral Blood. Send down immediately.	SJH - Endocrinology	Routine Hours	
IGF11	1 x 7.5ml Plain Tube - Peripheral Blood	Dr. Derek Teale - Royal Surrey County Hospital, Guilford	Routine Hours	
Immunoglobulins - IgA, IgG, IgM	1 x 7.5ml Plain Tube - Peripheral Blood	Beaumont - Protein Separation	Routine Hours	
Inhibin A+B	1 x 7.5ml Plain Tube - Peripheral Blood. Send down immediately.	Super Regional Protein Ref. Unit – Sheffield	Routine Hours	

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Insulin	1 x 7.5ml Plain Tube - Peripheral Blood. Send down immediately.	SJH - Endocrinology	Routine Hours	
Insulin Stress Test	1 x 7.5ml Plain Tube - Peripheral Blood for Growth Hormone + 1 x 7.5ml Plain Tube - Peripheral Blood for Cortisol Times 0, 30, 45, 60, 90, 120 mins. Corresponding 1 x 2.6ml Fluoride specimens for Glucose.	SJH – Endocrinology	Routine Hours	
Ionised Calcium	Contact Biochemistry for details.	Claymon	Routine Hours	
Iron (Serum)	1 x 7.5ml Plain Tube – Peripheral Blood	Connolly – Biochemistry	Routine Hours Out of Hours in cases of suspected overdose only	
Iron (Urine)	Plain 24Hr Urine	Claymon	Routine Hours	
Iron Saturation (included in Iron Studies)	1 x 7.5ml Plain Tube – Peripheral Blood	Connolly – Biochemistry	Routine Hours	
Iron Studies (Iron, Total Iron Binding Capacity (TIBC), Transferrin Saturation)	1 x 7.5ml Plain Tube – Peripheral Blood	Connolly – Biochemistry	Routine Hours	
Karyotyping	1 x 7.5ml Lithium Heparin Tube – Peripheral Blood*. Send down immediately.	OLCHC – Cytogenetics / Lab Link	Routine Hours Monday-Thursday Only	
Keppra (Levetirag)	1 x 7.5ml Plain Tube – Peripheral Blood- Send down immediately.	Claymon	Routine Hours	
Lamictal	1 x 7.5ml Plain Tube – Peripheral Blood. Send down immediately.	Claymon	Routine Hours	
Lamotrigine	1 x 7.5ml Plain Tube – Peripheral Blood	SJH – Immunology	Routine Hours	
Kappa Lambda Ratio (KLR)	1 x 2.6ml Fluoride Tube – Peripheral Blood. Send down immediately.	Connolly – Biochemistry	Routine & On-Call Hours	

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LDH (Lactate Dehydrogenase)	1 x 7.5ml Plain Tube – Peripheral Blood	Connolly – Biochemistry	Routine & On-Call Hours	
LDL (LDL-Cholesterol) (included in Lipid Profile)	1 x 7.5ml Plain Tube – Peripheral Blood. Min 12hr Fast	Connolly – Biochemistry	Routine Hours	
Lead (Serum)	1 x 7.5ml Lithium Heparin Metal Free Tube* - Peripheral Blood; taken with metal free needle.	Claymon	Routine Hours	
Lead (Urine)	Plain 24Hr Urine	Claymon	Routine Hours	
LH (Luteinising Hormone)	1 x 7.5ml Plain Tube – Peripheral Blood	Connolly – Endocrinology	Routine Hours	48 hrs
Lipase	1 x 7.5ml Plain Tube – Peripheral Blood	Claymon	Routine Hours	
Lipid Profile / Screen (Cholesterol, Triglyceride, HDL, LDL)	1 x 7.5ml Plain Tube – Peripheral Blood	Connolly – Biochemistry	Routine Hours	
Lipoprotein A	1 x 7.5ml Plain Tube – Peripheral Blood	Claymon	Routine Hours	
Lithium	1 x 7.5ml Plain Tube – Peripheral Blood. Take 12Hrs post dose.	Connolly – Biochemistry	Routine & On-Call Hours	
Liver Profile / LFT (Bilirubin, ALP, ALT, GGT)	1 x 7.5ml Plain Tube – Peripheral Blood	Connolly – Biochemistry	Routine & On-Call Hours	
Magnesium (Serum)	1 x 7.5ml Plain Tube – Peripheral Blood	Connolly – Biochemistry	Routine & On-Call Hours	
Magnesium (Urine)	Plain 24Hr Urine	Connolly – Biochemistry	Routine Hours	
Mercury (Peripheral Blood)	1 x 5ml EDTA – Peripheral Blood + taken with metal free needle	Claymon	Routine Hours	
Mercury (Urine)	Plain 24Hr Urine	Claymon	Routine Hours	
Metanephrines (Normetadrenaline + Metadrenaline)	24 Hr Urine with acid added	Beaumont – HPLC Biochemistry	Routine Hours	
Methaemoglobin – Dapsone Therapy	1 x 2.7mls EDTA	SJH – Biochemistry	Routine Hours	

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Methaemoglobin – Level	Venous Blood Gas	Beaumont – Biochemistry	Routine Hours On-Call – requires consultation with Beaumont Biochemistry	
Microalbumin	Spot Urine	Connolly - Biochemistry	Routine Hours	
Monoclonal Bands	1 x 7.5ml Plain Tube – Peripheral Blood	Beaumont – Protein Separation	Routine Hours	
Myeloma Screen	1 x 7.5ml Plain Tube – Peripheral Blood + Plain 24Hr Urine Collection	Beaumont – Protein Separation	Routine Hours	
Myoglobin	Spot Urine	SJH – Haematology	Routine Hours	
Noradrenaline	24Hr Urine with acid added.	Beaumont – HPLC Biochemistry	Routine Hours	
NTX	Contact Biochemistry for details. Part of a screen	St. Vincent's Metabolic Laboratory	Routine Hours	
Oestradiol	1 x 7.5ml Plain Tube – Peripheral Blood	Connolly – Biochemistry	Routine Hours	
Oligoclonal Bands	CSF + 1 x 7.5ml Plain Tube – Peripheral Blood.	Beaumont – Protein Separation/St.James Immunology	Routine Hours	
Organic Acids	Spot Urine. Send to lab immediately	Temple Street – Biochemistry	Routine Hours	
Oxalate	24 Hr Urine with acid added.	SJH – Biochemistry	Routine Hours	
Osmolality (Serum)	1 x 7.5ml Plain Tube – Peripheral Blood	Connolly – Biochemistry	Routine Hours	
Osmolality (Urine)	Spot Urine	Connolly – Biochemistry	Routine Hours	
Oxygen Saturation (included in ABG)	Air-free heparinised syringe. Labelled + on ice. Do not send in PTS.	Connolly – Biochemistry	Routine & On-Call Hours	20 mins
Paracetamol	1 x 7.5ml Plain Tube – Peripheral Blood	Connolly – Biochemistry	Routine & On-Call Hours	
Paraprotein	1 x 7.5ml Plain Tube – Peripheral Blood	Beaumont – Protein Separation	Routine Hours	

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Parathyroid Hormone (PTH)	1 x 7.5ml Plain Tube – Peripheral Blood on ice. Send down immediately	Beaumont – Renal Biochemistry	Routine Hours	
Parathyroid Related Protein (PTH-RP)	Contact Biochemistry for details	Claymon	Routine Hours	
pCO ₂ (included in ABG)	Air-free heparinised syringe. Labelled + on ice. Do not send in PTS.	Connolly – Biochemistry	Routine & On-Call Hours	20 mins
pH (included in ABG)	Air-free heparinised syringe. Labelled + on ice. Do not send in PTS.	Connolly – Biochemistry	Routine & On-Call Hours	20 mins
Phenobarbitone	1 x 7.5ml Plain Tube – Peripheral Blood	Beaumont – TDM	Routine Hours On-Call – requires consultation with Beaumont.	
Phenylalanine	1 x 7.5ml Lithium Heparin Tube – Peripheral Blood. Send down immediately	Temple Street – Biochemistry	Routine Hours	
Phenytoin	1 x 7.5ml Plain Tube – Peripheral Blood	Beaumont – TDM	Routine Hours On-Call – requires consultation with Beaumont.	
Phosphate (Serum) (included in Bone Profile)	1 x 7.5ml Plain Tube – Peripheral Blood	Connolly – Biochemistry	Routine & On-Call Hours	
Phosphate (Urine)	Plain 24Hr Urine	Connolly – Biochemistry	Routine Hours	
Phyllocortin (Theophylline)	1 x 7.5ml Plain Tube - Peripheral Blood	Beaumont - TDM	Routine Hours On-Call - requires consultation with Beaumont	
Placental Alkaline Phosphatase (PALP)	1 x 7.5ml Plain Tube - Peripheral Blood	Claymon	Routine Hours	
pO ₂ (included in ABG)	Air-free heparinised syringe. Labelled + on ice. Do not send in PTS.	Connolly - Biochemistry	Routine & On-Call Hours	20 mins

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Examination	Specimen Type	Analysing Laboratory	When Available	Turnaround Time
Porphyrin Screen / Porphyrins	<ul style="list-style-type: none"> • 24 Hr Plain Urine • 2 x 2.7ml EDTA • 1 x 7.5ml Lithium Heparin • Random Faeces <p>All must be light protected with tin foil. If screen positive, individual tests are carried out for Porphobilinogen, Erythrocyte Porphyrins, Urinary Porphyrins and delta-Aminolevulinic Acid</p>	SJH – Biochemistry	Routine Hours	
Porphobilinogen	24 Hr Urine. Must be light protected with tin foil.	SJH – Biochemistry	Routine Hours	
Potassium (Serum) (included in Renal Profile)	1 x 7.5ml Plain Tube - Peripheral Blood	Connolly – Biochemistry	Routine & On-Call Hours	
Potassium (Urine)	Plain 24Hr Urine or Spot Urine	Connolly – Biochemistry	Routine & On-Call Hours	
Progesterone	1 x 7.5ml Plain Tube - Peripheral Blood	SJH – Endocrinology	Routine Hours	48 hrs
PROGRAF	1 x 2.7ml EDTA	Beaumont	Routine Hours	
Prolactin	1 x 7.5ml Plain Tube - Peripheral Blood	Connolly – Endocrinology	Routine Hours	48 hrs
Post Fractionation Prolactin	Only done if Prolactin is >700mU/L 1 x 7.5ml Plain Tube - Peripheral Blood	Connolly – Biochemistry	Routine Hours	
Protein Electrophoresis	1 x 7.5ml Plain Tube - Peripheral Blood	Beaumont – Protein Separation	Routine Hours	
Protein, Total (Serum)	1 x 7.5ml Plain Tube - Peripheral Blood	Connolly - Biochemistry	Routine & On-Call Hours	
Protein, Total (Urine)	Plain 24Hr Urine	Connolly - Biochemistry	Routine Hours	
PSA-Total (Prostate Specific Antigen)	1 x 7.5ml Plain Tube - Peripheral Blood	Connolly - Endocrinology	Routine Hours	48 hrs
PSA-Free	Total PSA analysed first. Free measured if total >4 and <10ug/L	Connolly - Biochemistry	Routine Hours	

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Examination	Specimen Type	Analysing Laboratory	When Available	Turnaround Time
Pyruvate	Lactate must be elevated. Contact Biochemistry for details.	Claymon	Routine Hours	
Renal Profile (Urea, Na, K, Creatinine)	1 x 7.5ml Plain Tube - Peripheral Blood	Connolly - Biochemistry	Routine & On-Call Hours	
Renin	Resting: 2 x 2.7ml EDTA Standing: 2 x 2.7ml EDTA. Send down immediately	St James - Endocrinology	Routine Hours	
Rivital (Benzodiazopine)	1 x 7.5ml Plain Tube - Peripheral Blood. Dosage + Time of last dose must be given. Send down immediately	Claymon	Routine Hours	
Salicylate	1 x 7.5ml Plain Tube - Peripheral Blood	Beaumont - Toxicology	Routine Hours On-Call - requires consultation with Beaumont.	
Selenium	1 x 7.5ml Lithium Heparin Metal Free Tube - Peripheral Blood + taken with metal free needle	Claymon	Routine Hours	
Serotonin (Serum / Plasma)	Heparinised Whole Blood. Send down immediately. 48 Hrs before collection do not eat: bananas, chocolate, tomatoes, grapefruit, nuts, avocado, pineapple, plums, citrus fruits, tea, coffee	Claymon	Routine Hours	
Serotonin (Urine)	24 Hr Urine with acid added. Same diet restrictions apply as listed under serum serotonin.	Claymon	Routine Hours	
Sex Hormone Binding Globulin (SHBG)	1 x 7.5ml Plain Tube - Peripheral Blood	SJH - Endocrinology	Routine Hours	
Sirolimus	1 x 2.7ml EDTA	Beaumont	Routine Hours	

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Sodium - Serum (included in Renal Profile)	1 x 7.5ml Plain Tube - Peripheral Blood	Connolly - Biochemistry	Routine & On-Call Hours	
Sodium - Urine	Plain 24 Hr or Spot Urine	Connolly - Biochemistry	Routine & On-Call Hours	
Somastatin	Please contact Biochemistry for details	Claymon	Routine Hours	
Standard Bicarbonate. (included in ABG)	Air-free heparinised syringe. Labelled + on ice. Do not send in PTS.	Connolly - Biochemistry	Routine & On-Call Hours	20 mins
Stone Analysis	Renal Stones	Claymon	Routine Hours	
Sulphonylurea (GLIB)	Contact Biochemistry for details.	Claymon	Routine Hours	
Syncathen	1 x 7.5ml Plain Tube - Peripheral Blood for Cortisol Time 0, 30min, 60min	Connolly - Biochemistry	Routine Hours	
6-Thiopurine Methyltransferase (Purines / Pyrimidines) / TPMT	2 x 2.7ml EDTA Send down immediately.	Claymon	Routine Hours Monday - Wednesday Only	
Tacrolimus	1 x 2.7ml EDTA	Beaumont	Routine Hours	
Tegretol	1 x 7.5ml Plain Tube - Peripheral Blood	Beaumont - TDM	Routine Hours On-Call - requires consultation with Beaumont.	
Testosterone	1 x 7.5ml Plain Tube - Peripheral Blood	Connolly - Biochemistry	Routine Hours	
Thallium - Serum	1 x 7.5ml Plain Tube - Peripheral Blood	Claymon	Routine Hours	
Thallium - Urine	Plain 24 Hr Urine	Claymon	Routine Hours	
Theophylline	1 x 7.5ml Plain Tube - Peripheral Blood	Beaumont - TDM	Routine Hours On-Call - requires consultation with Beaumont.	
Thyroid Function Tests (TSH, FT4)	1 x 7.5ml Plain Tube - Peripheral Blood	Connolly - Endocrinology	Routine Hours	
Total Iron Binding Capacity (TIBC) (included in Iron Studies)	1 x 7.5ml Plain Tube - Peripheral Blood	Connolly - Biochemistry	Routine Hours	

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Transferrin Saturation (included in Iron Studies)	1 x 7.5ml Plain Tube - Peripheral Blood	Connolly - Biochemistry	Routine Hours	
Tryptase	1 x 7.5ml serum at: 1Hr Post 3-6 Hrs Post 24 Hr Post	SJH - Immunology	Routine Hours	
Troponin I	1 x 7.5ml Plain Tube - Peripheral Blood	Connolly - Biochemistry	Routine & On-Call Hours	
Tricyclics	1 x 7.5ml Plain Tube - Peripheral Blood	Beaumont - Toxicology	Routine Hours.	
Trypsinogen	See Faecal Elastase above.	N/A	N/A	
6-Thioguanine Nucleotide Methyl-6-Mercaptopurine	2 x 7.5ml Lithium Heparin Send down immediately.	Claymon	Routine Hours Monday - Wednesday Only	
Uniphyllin	1 x 7.5ml Plain Tube - Peripheral Blood	Beaumont - TDM	Routine Hours On-Call - requires consultation with Beaumont TDM.	
Urate - Serum	1 x 7.5ml Plain Tube - Peripheral Blood	Connolly - Biochemistry	Routine & On-Call Hours	
Urate - Urine	Plain 24 Hr Urine	Connolly - Biochemistry	Routine Hours	
Urea - Serum (included in Renal Profile)	1 x 7.5ml Plain Tube - Peripheral Blood	Connolly - Biochemistry	Routine & On-Call Hours	
Urea - Urine	Plain 24 Hr Urine	Connolly - Biochemistry	Routine & On-Call Hours	
1,25 Dihydroxycholecalciferol	Only done if 25- Hydroxycholecalciferol increased or clinically indicated. 1 x 7.5ml Plain Tube - Peripheral Blood on ice. Send down immediately.	St. Vincent's Metabolic Laboratory	Routine Hours	
V.L.C.F.A. (Very long chain fatty acids)	4 x 2.7mls EDTA	Willink Biochemical Genetics Unit - Manchester	Routine Hours Monday to Wednesday only	

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Valproate (Epilim)	1 x 7.5ml Plain Tube - Peripheral Blood	Beaumont - TDM	Routine Hours On-Call - requires consultation with Beaumont.	
VIP	Contact Biochemistry for details	Claymon	Routine Hours	
Vitamin A	1 x 7.5ml Lithium Heparin / Serum. Protect from light with tin foil . Send down immediately on ice.	Claymon	Routine Hours	
Vitamin B1(Thiamine)	1 x 2.7ml EDTA. Protect from light with tin foil . Send down immediately on ice.	Claymon	Routine Hours	
Vitamin B2(Riboflavin)	1 x 7.5ml Lithium Heparin. Protect from light with tin foil .	Claymon	Routine Hours	
Vitamin B3 (Niacin / Vitamin PP)	1 x 2.7ml EDTA. Send down immediately.	Claymon	Routine Hours Monday – Thursday Only	
Vitamin C	1 x 7.5ml Lithium Heparin on ice. Protect from light with tin foil . Send down immediately.	Claymon	Routine Hours	
Vitamin D (25-Hydroxycholecalciferol)	1 x 7.5ml Plain Tube - Peripheral Blood on ice. Protect from light with tin foil . Send down immediately.	St. Vincent's Metabolic Laboratory	Routine Hours	
Vitamin E	1 x 7.5ml Plain Tube - Peripheral Blood Protect from light with tin foil . Send down immediately.	Claymon	Routine Hours	
Vitamin K1	1 x 7.5ml Plain Tube-Peripheral Blood. Send down immediately	Claymon	Routine Hours	
Water Deprivation Test	Measure Plain 24Hr urine volume. Proceed to Water Deprivation test if >3L/day. Measure serum osmolality + urine osmolality during test.	Connolly-Biochemistry	Routine Hours	

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White Cell Enzymes	4 x 2.7mls EDTA	Willink Biochemical Genetics Unit- Manchester	Routine Hours Monday to Wednesday only.	
Zarontin (Ethosuximide)	1 x 7.5ml Plain Tube - Peripheral Blood	Claymon	Routine Hours	
Zinc - Serum	1 x 4.9ml Lithium Heparin Metal Free Tube - Peripheral Blood + taken with metal free needle	Claymon	Routine Hours	
Zinc - Urine	Plain 24Hr Urine	Claymon	Routine Hours	

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11.2.1 Guide to Number of Specimens Required for Test Profiles

Full clotted specimens are required unless otherwise specified. Refer to specimen requirements table above. Each Group requires a separate specimen. Groups 1, 2 and 3 which can go on the same green card, but each other Group 4 requires a separate request card. Tests not specified below require an additional request card and specimen.

Group 1 - Routine Biochemistry	Group 3 - Endocrinology / Haematinics
Renal Profile (RFT) Liver Profile (LFT) Bone Profile CPK Lipids Urate LDH AST Iron / TIBC / Transferrin Saturation Lithium Amylase Magnesium CRP Paracetamol Troponin I Glucose (Fluoride Oxalate specimen) Lactate (Fluoride Oxalate specimen)	Thyroid Function (FT4.TSH) FSH / LH Oestradiol Prolactin B12 Folate Ferritin FT3 PSA / fPS Cortisol
Group 2 - Diabetes	Group 4 - Miscellaneous Biochemistry
HbA1C (Additional EDTA specimen required)	Therapeutic Drugs, Drug Screen (Fluoride Oxalate spec. for Alcohol) Hormones not listed in Group 3

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11.3 Request Form

All test requests must be accompanied by a fully completed request form. Refer to section 6 of this document.

11.3.1 Clinical Chemistry Request Form

All hospital in-patient and out-patient requests must be made on the Clinical Chemistry request form.

CLINICAL BIOCHEMISTRY REQUEST FORM		LF-BIO-33	CONNOLLY HOSPITAL, BLANCHARDSTOWN	
HAVE YOU LABELLED THE SPECIMEN CORRECTLY?	PATIENT CHART No	SPECIMEN		
	DATE OF BIRTH	MALE/FEMALE		
	SURNAME	CLINICAL DETAILS		
	FIRST NAME			
	ADDRESS	DATE AND TIME TAKEN		
	CONS / GP	DR'S SIGNATURE	BLEEP	REPORT TO WARD
	GENERAL CLINICAL CHEMISTRY	HAEMATINICS	ENDOCRINOLOGY	MISCELLANEOUS
	Lab No.	Lab No.	Lab No.	Lab No.
	Lab No.	Lab No.	Lab No.	Lab No.
	Labelled by	Request entered by	Checked by	

DO NOT USE FOR FBC, COAG, D-DIMER, VIROLOGY

11.3.2 GP Request Form

All non-hospital / GP patient requests must be made on the GP request form.

CONNOLLY HOSPITAL, BLANCHARDSTOWN DUBLIN 15, IRELAND		G.P. REQUEST FORM Essential criteria *		PATHOLOGY LABORATORY LF-GEN-0015	
MRN (if available)		Doctor's Name*	Lab No		
Surname*		Doctor's Address*	Type of Specimen		
First Forename*		Date Taken*	Time Taken*		
Patient's Address*		Emergency Phone No.* (For critical reports)	Relevant clinical details and therapy:		
ETHNIC ORIGIN					
D.O.B.*	Gender*				
APPOINTMENTS FOR BLOOD TESTING Telephone (01) 6465365					
GP Use	Biochemistry	Endocrinology	Haematology	Immunology/Virology	Microbiology
8 hour fast for: Glucose, GTT	<input type="checkbox"/> Renal <input type="checkbox"/> Liver <input type="checkbox"/> Bone	<input type="checkbox"/> TFT <input type="checkbox"/> Ferritin <input type="checkbox"/> Vitamin B12 <input type="checkbox"/> Serum Folate <input type="checkbox"/> PSA <input type="checkbox"/> Other	<input type="checkbox"/> FBC <input type="checkbox"/> INR (Warfarin) <input type="checkbox"/> Coag Screen <input type="checkbox"/> Other		<input type="checkbox"/> Urine (C/S) <input type="checkbox"/> Sputum (C/S) <input type="checkbox"/> Stools (C/S) <input type="checkbox"/> MRSA Screen <input type="checkbox"/> Nose <input type="checkbox"/> Groin <input type="checkbox"/> Other Site
12 hour fast for: Lipid	<input type="checkbox"/> Lipid (min 12hr fast) <input type="checkbox"/> Cholesterol fast / random <input type="checkbox"/> Iron Studies <input type="checkbox"/> Glucose fast / random <input type="checkbox"/> Other				<input type="checkbox"/> Swab <input type="checkbox"/> Throat <input type="checkbox"/> HVS <input type="checkbox"/> Other Site
Food and drink not allowed except for water and prescribed medication if required.					<input type="checkbox"/> Other
FASTING <input type="checkbox"/>	Lab No	Lab No			
Labelled by:	Result entered by:		Checked by:		

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11.4 Urgent Requests

11.4.1 Urgent Requests - Routine and Out of Hours

To request that any specimen is processed urgently, please contact the relevant laboratory, by phone during routine hours or pager 158 out of routine hours, to ensure the specimen is expected and testing of the specimen is prioritised.

11.4.2 Urgent Out of Hours Toxicology and Therapeutic Drug Monitoring Requests

Urgent urine toxicology screens can be performed in A/E on the Biosite analyser. Blood toxicology, TDM, Carboxy-Haemoglobin and Methaemoglobin requests are forwarded to the **Biochemistry Laboratory Beaumont Hospital**. The medical scientist on call should be contacted directly by the requesting clinician through the switch in Beaumont at (01) 8093000.

11.5 Storage of Examined Specimens

Clinical Chemistry and Endocrinology specimens are kept for six days.

11.6 Requesting Additional Examinations

Subject to individual analyte stability, further tests on a specimen that is already in the laboratory can be requested by sending a request form stating the patient's details and additional tests required. Requests should be signed by the requesting doctor and contain the doctor's bleep number. Note, however, that for most routine analytes, stability concerns prevent addition of tests where the blood sample is more than **7 hours** old.

11.7 Analytical Failure

Analytical failure may be caused by specimens which are:

- Insufficient
- Haemolysed
- Grossly Lipaemic

In such cases repeat specimens may be requested.

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11.8 Reference Ranges

Routine Biochemistry	Range	Units	Comments
Urea	2.5-7.1	mmol/L	
Sodium	137-145	mmol/L	
Potassium	3.6-5.0	mmol/L	
Creatinine	58-110	umol/L	Male
	46-92	umol/L	Female
Total Bilirubin	3-22	umol/L	
ALT (SGPT)	21-72	U/L	Male
	9-52	U/L	Female
Alkaline Phosphatase	38-126	U/L	
GGT	8-78	U/L	
Protein	63-82	g/L	
Albumin	39-50	g/L	
Calcium	2.10-2.55	mmol/L	
In. Phosphate	0.81-1.45	mmol/L	
Chloride	98-107	mmol/L	
Lithium	0.6-1.2	mmol/L	Therapeutic
Lactate	0.70-2.10	mmol/L	
Magnesium	0.7-0.9	mmol/L	
Glucose	3.6-6.1	mmol/L	
	<5.6	mmol/L	Fasting
	5.6-6.9	mmol/L	Impaired Fasting
	>7.0-diabetic	mmol/L	If Fasting
Amylase	30-110	U/L	
Urate	208-506	umol/L	Male
Urate	149-446	umol/L	Female
AST (SGOT)	10-47	U/L	
LDH	313-618	U/L	
CPK	55-170	U/L	Male
	30-135	U/L	Female
Troponin I	<0.034	ng/mL	Normal
	>0.034	ng/mL	> 99 percentile
CSF Protein	0.12 - 0.60	g/L	
CRP	0.00- 10.00	mg/L	

Acid-Base	Range	Units	Comments
pH	7.38-7.42		
pCO ₂	4.7-6.0	kPA	
Base Excess	+/-2.5	mmol/l	
Std. Bicarbonate	21-25	mmol/l	
pO ₂	11-15	kPA	

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Endocrinology	Range	Units	Comments
HbA1C	20-42	mmol/mol	IFCC
Free T4	8.5 – 22.0	pmol / L	
Free T3	2.76 - 6.45	pmol / L	
TSH	0.4 - 4.0	mU / L	
Cortisol	138 - 690	nmol / L	8AM
	69 - 345	nmol / L	Midnight
FSH	2.8-14.4	U / L	Follicular Phase
	5.8-21	U / L	Midcycle
	1.2-9	U / L	Luteal
	21.7-153	U / L	Postmenopausal
	0.7-11.1	U / L	Male
LH	1.1-11.6	U / L	Follicular Phase
	17-77	U / L	Midcycle
	0.1-14.7	U / L	Luteal
	11.3-39.8	U / L	Postmenopausal
	0.8-7.6	U / L	Male
Oestradiol	<587	pmol/L	Follicular Phase
	124-1468	pmol/L	Midcycle
	101-905	pmol/L	Luteal
	<110	pmol/L	Postmenopausal
	<206	pmol/L	Male
Prolactin	53 - 360	mU / L	Male
	40 - 530	mU / L	Female
PSA	0.03- 4.0	ng /ml	
F/T PSA%	< 20% Refer to Urologist		
	>20% BPH		

Lipids	Range	Units	Comments
Cholesterol	< 5.20	mmol / L	
Triglyceride	<1.90	mmol / L	
HDL Cholesterol	1.00 - 1.70	mmol / L	
LDL Cholesterol	2.90 - 4.90	mmol / L	

Haematinics	Range	Units	Comments
B12	193-982	ng / L	
Folic Acid	3.0-15.0	ug / L	
Ferritin	28-365	ng /ml	Male
	5-148	ng /ml	Female
Iron	6.6-30.4	umol / L	Female
	8.8-32.4	umol / L	Male
Transferrin Saturation	15 - 50	%	
TIBC	44.8-80.6	umol / L	

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Miscellaneous	Range	Units	Comments
Plasma Osmolality	282 – 295	mosmol / Kg	
Urine Osmolality	400 – 1400	mosmol / Kg	

Urine Levels	Range	Units	Comments
Creatinine	8800-17600	umol/24Hr	Male
	7100 - 15900	umol/24Hr	Female
Protein	< 0.2	g / 24 hr	
Calcium	2.5 - 7.5	mmol / 24 hr	
Phosphate	12.9 - 42.0	mmol / 24 hr	
Sodium	40.0 - 220.0	mmol / 24 hr	
Potassium	35.0 - 90.0	mmol / 24 hr	
Urea	320.0 - 600.0	mmol / 24 hr	
Amylase	32.0 -641.0	U/L	
Urate	1.8 - 3.0	mmol / 24 hr	Nucleoprotein free diet
Urate	3.5 - 4.2	mmol / 24 hr	Average diet
Hydroxyproline	10.0 - 40.0	mg/24Hr	Claymon Range
Cortisol	40 - 240	nmol/24Hr	Claymon Range
Microalbumin	0.0-2.5	mg/gcreat	Male
	0.0-3.5	mg/gcreat	Female
Mg	3.0 - 5.0	mmol/24Hr	Beaumont Range

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12 BLOOD TRANSFUSION

The Blood Transfusion Department incorporates the Blood Transfusion laboratory, the Haemovigilance and Traceability functions, and the clinical transfusion consultancy service. The Blood Transfusion Department is accredited by the Irish National Accreditation Board (INAB) and is compliant with the International Standard titled “Medical Laboratories Particular Requirements for Quality and Competency” (ISO 15189:2007) and competent to comply with Articles 14 and 15 of EU Directive 2002/98/EC (S.I. No. 360 of 2005 and S.I. No. 547 of 2006).

The administration of Blood Components and Products involves more than 70 steps and each of these may be subject to error. Standard protocols for the administration of these Components and Products are essential to minimise the potential for error and are outlined in this User Handbook.

These are the recommended guidelines for use in Connolly Hospital Blanchardstown but cannot cover every situation. They are not meant to supersede clinical judgement.

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12.1 Services and Blood Components / Products Available from Connolly Hospital Blood Transfusion Department

Service / Component / Product	When Available	Specimen Required	Special Requirements	Turnaround Times
Group & Screen (G&S) also known as: Group & Hold Type & Screen Note: This is <u>not</u> a request for red cell units.	Routine Requests Mon-Fri 08.00 to 15.30 Sat 09.00 to 11.00 Urgent requests at any time. For elective cases, G&S should be received in laboratory by 15.30 on last routine day before surgery	7.5ml Specimen bottle labelled: "EDTA KE - FOR BLOOD TRANSFUSION" for Group & Screen	Minimum volume of 2.5ml for adults. Routine Requests Must be received in the laboratory before: 15.30 Monday to Friday or 11.00 Saturday Non Routine Urgent Requests Phone request at least 40 minutes before Red Cells are required with valid G&S. Requests must be made by a Registrar / Consultant. Emergency Requests At any time. Patients with identified antibody(ies) - G&S required at <u>least 24 hours</u> before Red Cells are required.	Non-Urgent Requests 2 hours (if received before 15.30 Monday to Friday or 11.00 Saturday) Urgent Requests 40 minutes
Crossmatched Red Cells	Routine Requests Mon-Fri 08.00 to 15.30 Sat 09.00 to 11.00 Urgent / emergency requests at any time	Group & Screen Specimen	Routine Requests Must be received in the laboratory before: 15.30 Monday to Friday or 11.00 Saturday Non Routine Urgent Requests Phone request at least 40 minutes before Red Cells are required with valid G&S. Requests must be made by a Registrar / Consultant. Emergency Requests At any time. Patients with identified antibody(ies) - G&S required at <u>least 24 hours</u> before Red Cells are required.	2 hours 1 hour 30 minutes 40 minutes Turnaround time dependent on the complexity of the case.

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Service / Component / Product	When Available	Specimen Required	Special Requirements	Turnaround Times
Uncrossmatched Red Cells	Urgent	Group & Screen Specimen	<u>All</u> requests for uncrossmatched red cells must be communicated by phone to the Blood Transfusion Laboratory.	No G&S sample available Group O Rh D Neg Red Cells available within 10 minutes Valid G&S sample in lab Group specific Red Cells available within 10 minutes
Platelets	Routine & Urgent	Group & Screen Specimen	Phone request and send request form well in advance of time required. Only 1 adult dose of platelets should be ordered at a time by a Registrar / Consultant. Only ordered from NBC(National Blood Centre) on named patient basis as required.	Non-Urgent Requests 2 hours Urgent Requests <1 hour
SD Plasma	Routine & Urgent	Group & Screen Specimen	Phone request & send request form at least 30 minutes before plasma is required by a Registrar or Consultant.	30 minutes / 2 units
Prothrombin Complex Concentrate (Octaplex)	Routine & Urgent	None	Phone request & send request form in advance. Reference to Haemovigilance Guidelines or discussion with Haematology Team if necessary.	10 minutes
Fibrinogen Concentrate	Routine & Urgent	None	Phone request & send request form in advance.	10 minutes
Specific Coagulation Factors	Routine & Urgent	None	Discussion with Haematology Medical Team required. Phone request & send request form in advance.	Specific coagulation factor concentrates are ordered from external suppliers as required. Turnaround times vary.

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Service / Component / Product	When Available	Specimen Required	Special Requirements	Turnaround Times
Albumin	Routine & Urgent	None	Phone request & send request form in advance.	10 minutes
Direct Antiglobulin Test	Routine Mon-Fri 08.00 to 15.30 Sat 09.00 to 11.00 Urgent requests at any time	EDTA Specimen	Non-Urgent Requests Must be received in the laboratory before: 15.30 Monday to Friday or 11.00 Saturday Urgent Requests Urgent out-of-hours requests must be made through the Haematology team.	2 hours 20 minutes

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12.2 Medical Indications, Appropriate Selection and Administration of Available Blood Components / Products

For information on medical indications, appropriate selection and administration of available Blood Components / Products refer to Haemovigilance Procedures:

LP-HV-0001 Administration of Blood Components and Blood Products

LP-HV-0004 Guidelines for the Use of Blood Components / Blood Products

LP-HV-0011 Guidelines for Use of Fibrinogen Concentrate

available in the Haemovigilance Folder on all wards and on the internet via link:

http://hsenet.hse.ie/Hospital_Staff_Hub/Connolly/Haemovigilance.html

The maximum blood ordering schedule (MBOS) (refer to section 12.3) should be adhered to for routine / elective surgery unless the clinical situation suggests otherwise. It is the responsibility of the doctor requesting the pre-operative group and screen to check the patient's Hb result at least 2 hours prior to scheduled surgery. If cross-matched blood is required for the patient the request should be communicated to the blood transfusion laboratory immediately, followed by a sample if required or a completed blood transfusion request form if there is a valid sample in the laboratory, to ensure that red cells are issued and ready for transport to theatre fridge prior to the patient arriving in theatre.

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12.3 Maximum Blood Ordering Schedule (MBOS)

	MBOS		MBOS
Orthopaedic		Gynaecology	
Above Knee Amputation	T/S	Bi Salpingo-Oophorectomy	T/S
Below Knee Amputation	T/S	Lap Oophorectomy	T/S
ORIF Femur	2	Myomectomy	T/S
ORIF Humerus	T/S	Ovarian Cystectomy	T/S
Austin Moore's Prosthesis	T/S	Subtotal Abdominal Hysterectomy	T/S
DHS	T/S	TAH	T/S
Hemiarthroplasty	2	Vaginal Hysterectomy	T/S
Fasciotomy for Lower Limb Ischemia	T/S		
Fasciotomy for Upper Limb Ischemia	T/S	General	
Decompression Fasciotomy Calf / Forearm	T/S	Endoscopic Banding of Oesophageal Varices	T/S
External Fixation of # Pelvis	T/S	Total Gastrectomy	T/S
IM Nailing Femur	2	Subtotal Gastrectomy	T/S
Total Hip Replacement	T/S	Oesophagogastrectomy	T/S
Total Knee Replacement	T/S	Oesophagectomy	T/S
		Subtotal Thyroidectomy	T/S
Colorectal Surgery		Thyroidectomy	T/S
Abdominal Perineal Resection	2	Parathyroidectomy	T/S
Colostomy	T/S	Lap Cholecystectomy	T/S
Hartmans Procedure	2	Open Cholecystectomy	T/S
Ileorectal Anastomosis	T/S	Nissen Fundoplication	T/S
Jejunocolic Anastomosis	T/S	R/O Diaphragmatic Hernia	T/S
Lt Hemicolectomy	T/S	Repair of Incarcerated Hernia	T/S
Rt Hemicolectomy	T/S	Simple Mastectomy	T/S
Rectopexy	T/S	Splenectomy	2
Subtotal Colectomy	T/S	Hellers Myotomy	T/S
Sigmoid Colectomy / High Anterior Resection	2	Adrenalectomy	T/S
Low Anterior Resection with TME	2		
		Cardio Thoracic Surgery	
Urology		Thoracotomy	2
Nephrectomy	2		
TURP	T/S		

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12.4 Information for Patients

For information and instructions provided to patients in relation to their own preparation before specimen collection, refer to leaflet **LF-HV-0001 Blood Transfusion Information for Patients and Families**, available on all wards. The information leaflet is also available in Russian, Polish, Irish, Chinese and French on the Connolly Hospital Intranet under “Haemovigilance”. It must be recorded on **LF-HV-0002 Blood Transfusion Record Form** whether or not the patient receives the information leaflet.

12.5 Identification of Patient

- Check that the patient is wearing an ID band. Patients who can communicate must be asked to state their surname, first name and date of birth.
- If the patient is not wearing an ID band or there are discrepancies between the information on the ID band and the information from the patient or healthcare record **DO NOT PROCEED** with specimen collection until a correct ID band is applied.

Ref: Connolly Hospital Policy on Patient Identification.

- In emergency situations refer to Haemovigilance procedures on using Typenex Identification band.

Ref.: **WI-HV-0005 Unidentified Patient Policy**

12.6 Completion of the Request Form

All Blood Components / Products or DAT requests must be ordered on a Blood Transfusion Request Form. Ref.: **LF-BT-0094 Blood Transfusion Request Form**

BLOOD TRANSFUSION

CONNOLLY HOSPITAL BLANCHARDSTOWN

LF-BT-0094 BLOOD TRANSFUSION REQUEST FORM EXT. 5302 CONNOLLY HOSPITAL BLANCHARDSTOWN

HEALTHCARE RECORD NO.*

DATE OF BIRTH* GENDER M / F

SURNAME*

FIRST NAME*

LOCATION

CONSULTANT

REQUESTED BY BLEEP NO.

SPECIMEN TAKEN BY* BLEEP NO. DATE TIME

TESTS REQUIRED

Group + Screen Only Direct Antiglobulin Test Antibody Investigation Transfusion Reaction Investigation Other (Specify)

COMPONENT / PRODUCT REQUIRED - STATE NUMBER OR VOLUME REQUIRED; REFER TO MBOS OVERLEAF

Transfusion History

ANY PREVIOUS TRANSFUSIONS? YES NO

DATE OF LAST TRANSFUSION

BLOOD GROUP (IF KNOWN)

ANY PREVIOUS ANTIBODIES? YES NO

ANY TRANSFUSION REACTIONS? YES NO

ANY PREGNANCIES IN THE PAST MONTH? YES NO

Reason for Transfusion

SURGERY (Specify Procedure)

ANAEMIA Hb

BLEEDING

OTHER (Specify)

REQUIRED FOR

Date Time

SPECIAL REQUIREMENTS

CMV Neg Irradiated

DIAGNOSIS

FOR LABORATORY USE ONLY

LAB NO.

PAS RECORDS CHECKED

HISTORICAL GROUP

FOR LABORATORY USE ONLY

DATE + TIME RECEIVED

TYPENEX BANDS MUST BE USED if full name, date of birth and for healthcare record number are unavailable e.g. Unidentified patients or PAS system out of order

Complete specimen and form details using BLOCK CAPITALS and a ballpoint pen.

SPECIMENS AND / OR REQUEST FORMS FAILING TO COMPLY WITH CONNOLLY HOSPITAL LABELLING CRITERIA WILL BE DISCARDED

* DENOTES MANDATORY REQUIREMENTS

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Telephone requests for crossmatched red cells, platelets, SD plasma etc. must be accompanied by a transfusion request form before blood components / products can be issued to the patient. The clinician requesting the blood component / product should complete and sign the transfusion request form.

12.6.1 Three Patient Identifiers Available – Full Name, Healthcare Record Number and Date of Birth

Request Form	
Essential Information	<ol style="list-style-type: none"> 1. Full name - surname / family name and first name (correctly spelt; no abbreviations) – as appears on ID band 2. Unique identification number (Healthcare Record Number) (Also known as chart number or hospital number) 3. Date of birth 4. Identity of the person taking the blood specimen
Desirable Information	Gender of patient Patient location Contact number of person taking the blood sample Name, signature and bleep no. of requester Test required e.g. Group& Screen or Crossmatch Blood component(s) / product(s) required No. of units / volume of blood component / product required Date and time required blood component(s) / product(s) Date and time specimen was drawn Indications for request Patient diagnosis Any special requirements e.g. CMV seronegative, gamma irradiated. Previous transfusion history including previous red cell antibodies or adverse reactions Obstetric history

Patient details on the request form are taken from the patient's Healthcare Record which are confirmed at the bedside with the patient's ID band and also confirmed with the patient.

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12.6.2 Three Patient Identifiers Not Available

This labelling protocol must be implemented when one or all of the 3 critical identifiers i.e. full name, date of birth and / or healthcare record number, is not available.

For the **unidentified patient**, the form should be labelled with any available patient details but **must** contain the following minimum details:

Request Form
<ol style="list-style-type: none"> 1. Typenex Blood Recipient Identification Number (if 3 unique identifiers i.e. full name, HRN and / or DOB are not available) 2. Identity of the person taking the blood specimen 3. Unique identification number (Healthcare Record Number) 4. Gender of the patient or any available patient details (name, HRN and / or DOB)

12.7 Labelling of Specimens

The person who has identified the patient and drawn the sample must label the sample immediately after phlebotomy. The sample tube must be **handwritten** and labelled at the patient's bedside.

12.7.1 Three Patient Identifiers Available – Full Name, HRN, and Date of Birth

Sample tubes **must be hand written** and labelled with the following details:

Specimen	
Essential Information	<ol style="list-style-type: none"> 1. Full name - surname / family name and first name (correctly spelt; no abbreviations) – as appears on ID band 2. Unique identification number (Healthcare Record Number) 3. Date of birth 4. Signature of the person drawing the blood specimen*
Desirable Information	<p>Ward</p> <p>Date and time sample was drawn</p>

* The signature is required to confirm that this person has verified the patient's identification and date and time sample was drawn.

The information **must** be identical to that on the patient's ID band.

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Addressographs labels are **not** permitted on pre-transfusion sample bottles in any circumstances even if the details are also hand written on the sample.

12.7.2 *Three Patient Identifiers Not Available*

This labelling protocol must be implemented when one or all of the 3 critical identifiers i.e. full name, date of birth and / or healthcare record number, is not available.

For the **unidentified patient**, the sample tube should be labelled with any available patient details but **must** be labelled with the following minimum details:

<p>Specimen - Details <u>must</u> be handwritten</p> <p>For the unidentified patient, the specimen tube should be labelled with any available patient details and the following minimum details:</p> <ol style="list-style-type: none"> 1. Unique identification number (Healthcare Record Number) 2. Typenex Blood Recipient Identification Number (if 3 unique identifiers i.e. full name, HRN and / or DOB are not available) 3. Gender or any available patient details (name, HRN and / or DOB) 4. Signature of the person drawing the blood specimen*
--

12.8 Specimen Transport

Refer to section 8 of this manual.

12.9 Storage of Examined Samples

Separated plasma is stored in the Jewett freezer (CTF 406) for a minimum of 7 days at $\leq -18^{\circ}\text{C}$, in compliance with British Committee for Standards in Haematology and Blood Transfusion (BCSH) Guidelines.

Primary Samples are stored in the Blood Transfusion laboratory fridge at 4°C for a minimum 7 days.

Ref: Guidelines for Compatibility Procedures in Blood Transfusion Laboratories, BCSH. *Transfusion Medicine*, 2004, 14, 59–73.

12.10 Reports

Results are telephoned as per section 9 of this manual. Results are available on the LIS in clinical areas.

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12.10.1 Issuing of Reports during Normal Opening Hours

Results are entered into the laboratory information system (Telepath) and authorized upon completion. Results of requests which have been accepted as urgent and results requiring clinical attention are phoned to the relevant clinical area or requesting clinician. A copy of the report is printed, checked and placed in 'Reports Out' tray for sorting and distribution by the Laboratory Office Staff and Transport Personnel respectively or retained in the Blood Transfusion Laboratory for dispatch with issued blood components / products. Hospital reports are delivered twice a day (Mon-Fri) at 14:00 and 17:00.

12.10.2 Issuing of Reports On-Call

Results are entered into the laboratory information system (Telepath) and authorized upon completion. Results of requests which have been accepted as urgent and results requiring clinical attention are phoned to the relevant clinical area or requesting clinician. A copy of the report is printed and left for checking and distribution by routine staff unless it has to be dispatched with issued blood components / products. In such cases details will be checked retrospectively by routine staff.

12.11 Requesting Additional Examinations

All additional requests for blood components / products must be communicated to the blood transfusion laboratory via phone and must be accompanied by a Blood Transfusion Request Form as per section 12.6 of this handbook.

12.11.1 Time Limits for Requesting Additional Examinations

- If a patient has had a red cell transfusion or been pregnant within the last month the patient's current Group & Screen specimen must not be greater than 72 hours old, at the projected time of transfusion completion, in compliance with BCSH Guidelines.
- If a patient has not had a red cell transfusion or not been pregnant within the last month, then a Group & Screen specimen must not be greater than 7 days old at the projected time of transfusion completion, in compliance with BCSH Guidelines.
- Group specific SD plasma or platelets may be issued if the patient has a sample valid for red cell transfusion or if the patient has been previously grouped on 2 separate pre-transfusion samples. If the patient does not have a sample valid for red cell transfusion or has not previously been grouped on 2 separate samples a new pre-transfusion sample is required before group specific components can be issued.

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- A valid pre-transfusion sample is not required for the issue of non-group specific blood products e.g. albumin, prothrombin complex concentrate (Octaplex), fibrinogen or factor concentrates.

12.11.2 Repeat Examinations

Specimens are stored in the Blood Transfusion laboratory fridge at 4°C for at least 7 days and additional serological tests may be requested within this time period. Such tests include investigation of a suspected transfusion reaction.

In certain circumstances a repeat Group & Screen specimen may be required for additional serological investigations.

Analytical failure may be caused by specimens which are:

- Insufficient
- Haemolysed
- Grossly Lipaemic

In such cases a repeat Group & Screen specimen may be requested.

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12.12 Services Provided by Referral Laboratories for Connolly Hospital Blood Transfusion Department

12.12.1 Specimen Requirements

Test	When Available	Sample Type	Referral Lab
Red Blood Cell Investigations			
Antibody Investigation	Routine only	7.5ml EDTA	Crossmatch NBC IBTS
Antibody Investigation + Crossmatch			
ABO + Rh D Group Confirmation			
DNA Typing - *Heparin must not be used as it interferes with DNA tests.			
*DNA Typing (HPA, HLA etc) for: Disease Associations Platelet Refractoriness Investigation Platelet Phenotyping / Genotyping	Routine only (Samples must arrive in the lab before 10am Monday to Friday)	5-10ml Tri-sodium citrate (Green Capped Tube)	NHIRL IBTS
*DNA Typing of HSCT Patients			
*DNA Typing of Potential Donors			
Leucocyte / Platelet Alloimmune Investigations			
HLA and Platelet Specific Alloantibody Screening / Identification	Routine only (Samples must arrive in the lab before 10am Monday to Thursday)	5-10ml clotted	NHIRL IBTS
Adverse Transfusion Reaction Investigations			
Post Transfusion Purpura (PTP)	Routine only (Samples must arrive in the lab before 10am Monday to Friday)	5-10ml clotted + 5ml EDTA Discuss with IBTS Consultant / Haemovigilance	NHIRL IBTS
Transfusion –related acute lung injury (TRALI)	Routine only (Samples must arrive in the lab before 10am Monday to Friday)	5-10 ml clotted Discuss with IBTS Consultant / Haemovigilance	NHIRL IBTS

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Platelet Immunology			
Drug Related Thrombocytopenia	Routine only (Samples must arrive in the lab before 10am Monday to Thursday)	2 x 2.7ml EDTA + 10ml clotted + sample of drug(s)	NBS Bristol
Autoimmune Thrombocytopenia		6 x 2.7ml EDTA + 6ml clotted	
Thromboasthenias		Contact the NBS Bristol before referring samples	
Granulocyte Immunology			
Autoimmune Neutropenia	Routine only (Samples must arrive in the lab before 10am Monday to Thursday)	10ml clotted	NBS Bristol
Drug Related Neutropenia		10ml clotted + sample of drug(s)	

All specimens should be labelled with hand-written patient details as per section 12.7. When a patient / donor cannot be identified an accident and emergency unique number or code may be used. All specimens should be accompanied by the appropriate request form completed by the requesting doctor. Refer to section 12.12.2.

12.12.2 Request Forms

NHIRL Request Form – Available from the Blood Transfusion Laboratory

To be completed by the requesting doctor

<p align="center">National Histocompatibility and Immunogenetics Reference Laboratory (NHIRL) EFI Accredited since 2001 REQUEST FORM BT 255-4</p>  <p align="center">Irish Blood Transfusion Service, National Blood Centre, James's Street, Dublin 8. Tel: +353 1 432 2975. Fax: +353 1 432 2701. NHIRL Customer Handbook: www.ibts.ie (Our Services)</p> <p><small>Please ensure specimen is labelled with Full name, Date of birth, Hospital No. and date of collection.</small></p>				<p>This section for use of NHIRL only</p> <p>Date and time specimen received at NBC: _____</p> <p>Specimen labelled: _____</p> <p>Specimen disposition/condition: _____</p> <p>LABORATORY NUMBER: _____</p> <p>COMMENTS:</p>	
Hospital / Referring Centre		Nature of specimen			
Surname		Date/time sample taken			
Forename		Hospital No.	Ethnic Origin		
Date of Birth: / /	Male <input type="checkbox"/> Female <input type="checkbox"/>	Laboratory No.	Order No.		
Report to:					
Diagnosis & clinical history					
<p align="center">PLEASE COMPLETE FOR IMMEDIATE AND EXTENDED FAMILY MEMBERS ONLY</p> <p>Conor relationship to patient: _____ Patient name and date of birth: _____</p>					
Any history of NAT? Yes / No	Previous transfusion? YES / NO	Date of most recent			
<input checked="" type="checkbox"/> Investigations Required		Samples			
HLA B27 typing		S - 10ml EDTA / citrate			
HLA Class I & II typing of transplant patients and family members		S - 10ml EDTA / citrate			
HLA and disease association: HLA-A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> DR <input type="checkbox"/> DQ <input type="checkbox"/> DP <input type="checkbox"/>		S - 10ml EDTA / citrate			
HLA Class I typing for HLA matched platelets		S - 10ml EDTA / citrate			
Screening for HLA antibodies		S - 10ml clotted			
Screening for Platelet Ab antibodies		S - 10ml clotted			
Platelet refractoriness		10ml clotted + 3 - 10ml EDTA / citrate			
HLA-Human platelet antigen typing		5ml EDTA			
Neonatal alloimmune thrombocytopenia (NATP)		Mother: 20ml clotted + S - 10ml EDTA Father: 20ml EDTA, Neonate: 5ml EDTA Discuss with IBTS Consultant/Registrar			
Post-transfusion purpura (PTP)		S - 10ml clotted + 5ml EDTA Discuss with IBTS Consultant/Haemoglossin			
Transfusion - related acute lung injury (TRALI)		20ml clotted + S - 10ml EDTA Discuss with IBTS Consultant/Haemoglossin Please forward samples to QC Lab, NIC, IBTS			
<input checked="" type="checkbox"/> Tick Box to indicate required investigation(s) High risk specimen? YES <input type="checkbox"/> NO <input type="checkbox"/>		Signed: _____ Date: _____			
Please telephone urgent requests					

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13 HAEMATATOLOGY

13.1 Specimen Requirements

13.1.1 Routine Haematology

Examination	Specimen Type	Analysing Laboratory	When Available	Turnaround Time
Full Blood Count (FBC)	1x2.7ml EDTA Tube - Peripheral Blood	Connolly – Haematology	Routine + On-Call Hours	1 hour
ESR	1x2.7ml EDTA Tube - Peripheral Blood – Sample must be < 4hrs old	Connolly – Haematology	Routine Hours On-Call in cases of suspected temporal arthritis only	2 hours
Blood Film Examination	1x2.7ml EDTA Tube - Peripheral Blood – contact laboratory if urgent.	Connolly – Haematology	Routine Hours	48 hours
Malaria Parasite Screen	1x2.7ml EDTA Tube - Peripheral Blood – Sample must be < 4hrs old – Contact laboratory with patient history	Connolly – Haematology	Routine + On-Call Hours	3 hours
Monospot (infectious mononucleosis screen)	1x2.7ml EDTA Tube - Peripheral Blood – contact laboratory if urgent.	Connolly – Haematology	Routine Hours	24 hours
Reticulocyte Count	1x2.7ml EDTA Tube - Peripheral Blood	Connolly – Haematology	Routine Hours	8 hours
Haptoglobin	1x2.7ml EDTA Tube - Peripheral Blood	Connolly – Haematology	Routine Hours	56 hours
Sickle cell screen	1x2.7ml EDTA Tube - Peripheral Blood – contact laboratory if patient is for theatre	Connolly – Haematology	Routine Hours On-Call only if patient is for theatre	24 hours
1x2.7ml EDTA specimen is sufficient to perform all of the above examinations				
Haemolytic Screen: FBC, Reticulocytes, Haptoglobins, Direct Antiglobulin Test	2x2.7ml EDTA Tube - Peripheral Blood – Patient must not have been transfused in past 3 months	Connolly – Haematology / Blood Transfusion	Routine Hours	56 hrs

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13.1.2 Specimen Requirements – Coagulation

*****N.B. Please fill the specimen bottle to the mark. The ratio of anticoagulant to blood is critical for coagulation examinations.*****

Please state if patient is on anticoagulant therapy.

Examination	Specimen Type	Analysing Laboratory	When Available	Turnaround Time
Prothrombin Time (PT)	1x3ml Sodium Citrate Tube - Peripheral Blood	Connolly – Haematology	Routine + On Call Hours	1 hr
INR	1x3ml Sodium Citrate Tube - Peripheral Blood	Connolly – Haematology	Routine + On Call Hours	1 hr
Activated Partial Thromboplastin Time (APTT)	1x3ml Sodium Citrate Tube - Peripheral Blood	Connolly – Haematology	Routine + On Call Hours	1 hr
Coagulation Screen (PT, INR + APTT)	1x3ml Sodium Citrate Tube - Peripheral Blood	Connolly – Haematology	Routine + On Call Hours	1 hr
Derived Fibrinogen	1x3ml Sodium Citrate Tube - Peripheral Blood	Connolly – Haematology	Routine + On Call Hours	1 hr
D-Dimer	1x3ml Sodium Citrate Tube - Peripheral Blood. Sample must be < 4 hours old	Connolly – Haematology	Routine + On Call Hours	1 hr
One 3ml Sodium Citrate Sample is sufficient to perform all of the above examinations				

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13.1.3 Specimen Requirements – Special Haematology

Examination	Specimen Type	Analysing Laboratory	When Available	Turnaround Time
Platelet Function Tests	6x3ml Sodium Citrate Tube Peripheral Blood 1x2.7ml EDTA Tube - Peripheral Blood	Connolly – Haematology	Routine Hours only by prior arrangement with Haematology Lab.	1 week
Bone Marrow Aspirate	RPMI – Contact Haematology for RPMI specimen containers.	Connolly – Haematology	Routine Hours in consultation with Haematology team only	1 week

13.2 Specimen Requirements – Specimen Referred to External Laboratories

13.2.1 Special Haematology

Examination	Specimen Type	Analysing Laboratory	When Available	Turnaround Time
β_2 Glycoprotein	1x7.5 Plain Tube - Peripheral Blood	SJH - Immunology	Routine Hours	
Erythropoietin levels	1x7.5 Plain Tube - Peripheral Blood	SJH - B12 / Folate	Routine Hours	2 weeks
G6PD	1x2.7ml EDTA Tube - Peripheral Blood	SJH - Haematology	Routine Hours	
Haemochromatosis (HFE Gene)	1x2.7ml EDTA Tube - Peripheral Blood - Patient information form filled in by requesting Dr. and signed by patient must accompany specimen – see 13.3.4	MMUH - GI Laboratory	Routine Hours	1 month
Haemoglobinopathy Screen Hb Electrophoresis	1x2.7ml EDTA Tube - Peripheral Blood	MMUH - Haematology	Routine Hours	
WC Lysozyme Enzyme	1x2.7ml EDTA Tube - Peripheral Blood	Manchester	Routine Hours	

SJH – St James' Hospital

MMUH – Mater Misericordiae University Hospital

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13.2.2 Special Coagulation

Please state relevant clinical details, anticoagulant status and family history. Specimens must arrive in laboratory before 12md Monday to Friday.

Examination	Specimen Type	Analysing Laboratory	When Available	Turnaround Time
Anti Factor Xa levels	2x3ml Sodium Citrate Tube - Peripheral Blood - 3 hours post Inohep	SJH – NCHCD	08.00 to 15.00 Monday to Friday only	1 week
Factor Assays	Minimum 2x2.7ml Sodium Citrate - Peripheral Blood Contact Haematology Laboratory	SJH – NCHCD	08.00 to 15.00 Monday to Friday only	
HIT Screen	2x3ml Sodium Citrate Tube - Peripheral Blood 1x7.5ml Plain Tube - Peripheral Blood	SJH – NCHCD	08.00 to 15.00 Monday to Friday only	4 weeks
Lupus Anticoagulant Only	4x3ml Sodium Citrate Tube - Peripheral Blood	SJH – NCHCD	08.00 to 15.00 Monday to Friday only	
Protein C (for Meningococcal Septicaemia)	2x3ml Sodium Citrate Tube - Peripheral Blood – This is an emergency request	SJH – NCHCD (Routine) SJH – CPL (On-Call)	Routine + On-Call Hours	
Prothrombin Gene Mutation	1x2.7ml EDTA Tube - Peripheral Blood	SJH – NCHCD	Routine Hours	
Thrombophilia Screen: Antithrombin Protein C Protein S Lupus Anticoagulant Screen Activated Protein C Resistance (APCR) Factor V Leiden	6x3ml Sodium Citrate Tube - Peripheral Blood 1x2.7ml EDTA Tube - Peripheral Blood Must only be requested in consultation with the Haematology team. Factor V Lieden only performed if APCR <2.1	SJH - NCHCD	08.00 to 15.00 Monday to Friday only	4-6 weeks
Von Willibrands Screen (vWF)	4x2.7ml Sodium Citrate Tube - Peripheral Blood	SJH – NCHCD	08.00 to 15.00 Monday to Friday only	4 weeks

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13.2.3 Flow Cytometry and Genetic Analysis

The following tests may only be ordered by the Haematology team.

Examination	Specimen Type	Analysing Laboratory	When Available	Turnaround Time
BCR-ABL	1x2.7ml EDTA Tube - Peripheral Blood	SJH - Cancer Molecular Diagnostics	Routine Hours	
CLL MRD	RPMI - Peripheral Blood / Bone Marrow - Contact Laboratory for tubes	SJH - Cancer Molecular Diagnostics	Routine Hours	
Cytogenetics	RPMI- Peripheral Blood / Bone Marrow - Contact Laboratory for tubes	OLCHC - Cytogenetics	Routine Hours	
Flow Cytometry / Immunophenotyping	1x2.7ml EDTA Tube - Peripheral Blood / Bone Marrow - Contact Laboratory for tubes	SJH - Special Haematology	Routine Hours	
Hereditary Spherocytosis	1x2.7ml EDTA Tube - Peripheral Blood	SJH - Special Haematology	Routine Hours	
IgVH Mutation Analysis	1x2.7ml EDTA Tube - Peripheral Blood	Southampton General Hospital - Cancer Science Division	Routine Hours	
JAK2 Mutation	1x2.7ml EDTA Tube - Peripheral Blood	SJH - Cancer Molecular Diagnostics	Routine Hours	
MTHFR	2x2.7ml EDTA Tube - Peripheral Blood	Clayton	Routine Hours	
PNH Screen	1x2.7ml EDTA Tube - Peripheral Blood	SJH - Special Haematology	Routine Hours	
TCR (T Cell Receptors)	1x2.7ml EDTA Tube - Peripheral Blood / Bone Marrow - Contact Laboratory for tubes	SJH - Cancer Molecular Diagnostics	Routine Hours	

NCHCD – National Centre for Hereditary Coagulation Disorders, St James’ Hospital
 SJH – St James’ Hospital
 OLCHC – Our Lady’s Children’s Hospital Crumlin
 MMUH – Mater Misericordiae University Hospital

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13.3 Request Forms

13.3.1 Haematology and Coagulation Request Form

All hospital in-patient and out-patient requests must be made on the Haematology and Coagulation request form.

LF-HAEM-0056 HAEMATOLOGY AND COAGULATION REQUEST FORM CONNOLLY HOSPITAL, BLANCHARDSTOWN			
Patient's Chart No.:		Location	Lab No.:
Surname:			Labelled by Initials
First Name:	Sex:	Cons / G.P.	Lab No.:
Date of Birth:	Ethnic Origin:		
Address:		Date / Time:	Requested by: (Dr. Signature)
			Bleep No.:
Please attach Patient Labels to both copies TICK APPROPRIATE BOX			
HAEMATOLOGY TESTS		COAGULATION TESTS	
<input type="checkbox"/> FBC <input type="checkbox"/> Other (specify) _____		NOTE: It is critical to indicate anticoagulant therapy and clinical details <input type="checkbox"/> PT Anticoagulant Therapy <input type="checkbox"/> APTT <input type="checkbox"/> On Warfarin <input type="checkbox"/> INR <input type="checkbox"/> On Heparin <input type="checkbox"/> Other (specify) _____ <input type="checkbox"/> Other (specify) _____	
CLINICAL DETAILS			
<input type="checkbox"/> Pre Op <input type="checkbox"/> Post Op <input type="checkbox"/> Post transfusion <input type="checkbox"/> Other (specify) _____			


13.3.2 GP Request Form

All non-hospital / GP patient request must be made on the GP request form.


CONNOLLY HOSPITAL, BLANCHARDSTOWN DUBLIN 15, IRELAND		G.P. REQUEST FORM Essential criteria *		PATHOLOGY LABORATORY LF-GEN-0015	
MRN (if available)		Doctor's Name*	Lab No		
Surname*		Doctor's Address*	Type of Specimen		
First Forename*			Time Taken*		
Patient's Address*		Date Taken*	Relevant clinical details and therapy:		
ETHNIC ORIGIN		Emergency Phone No.* (For critical reports)			
D.O.B.*	Gender*				
APPOINTMENTS FOR BLOOD TESTING Telephone (01) 6465365					
GP Use	Biochemistry	Endocrinology	Haematology	Immunology/Virology	Microbiology
8 hour fast for: Glucose, GTT	<input type="checkbox"/> Renal <input type="checkbox"/> Liver <input type="checkbox"/> Bone	<input type="checkbox"/> TFT <input type="checkbox"/> Ferritin <input type="checkbox"/> Vitamin B12 <input type="checkbox"/> Serum Folate <input type="checkbox"/> PSA <input type="checkbox"/> Other	<input type="checkbox"/> FBC <input type="checkbox"/> INR (Warfarin) <input type="checkbox"/> Coag Screen <input type="checkbox"/> Other		<input type="checkbox"/> Urine (C/S) <input type="checkbox"/> Sputum (C/S) <input type="checkbox"/> Stools (C/S) <input type="checkbox"/> MRSA Screen <input type="checkbox"/> Nose <input type="checkbox"/> Groin <input type="checkbox"/> Other Site _____ <input type="checkbox"/> Swab <input type="checkbox"/> Throat <input type="checkbox"/> HVS <input type="checkbox"/> Other Site _____ <input type="checkbox"/> Other
12 hour fast for: Lipid	<input type="checkbox"/> Lipid (min 12hr fast) <input type="checkbox"/> Cholesterol fast / random <input type="checkbox"/> Iron Studies <input type="checkbox"/> Glucose fast / random <input type="checkbox"/> Other				
Food and drink not allowed except for water and prescribed medication if required	Lab No	Lab No			
FASTING: <input type="checkbox"/>					
Labelled by:		Result entered by:		Checked by:	

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13.3.3 Haemochromatosis Genetic Testing Request Form



Centre for Liver Disease, 55 Eccles Street, Dublin 7.
Mater Misericordiae University Hospital



Haemochromatosis Genetic Testing

Screening Request Form (C282Y & H63D Mutations)

• **PATIENT DETAILS**

NAME: _____
D.O.B.: _____
ADDRESS: _____
TELEPHONE NO.: _____
GENDER: _____
NATIONALITY: _____
HOSPITAL MRN: _____

• **REQUESTING CLINICIAN**

REFERRING CLINICIAN: _____
ADDRESS FOR REPORT: _____
TEL/FAX NO. _____

• **REASON FOR REQUESTING HFE GENOTYPE**

• FAMILY HISTORY: Yes / No (If Yes please state relationship to index case): _____

• **CLINICAL INDICATIONS (PLEASE TICK)**

	Yes	No	UNKNOWN	DETAILS
Raised serum ferritin				
Raised transferrin saturation %				
Abnormal liver function tests				
Diabetes				
Cardiomyopathy				
Arthropathy/arthritis				
Fatigue				
Other (please Specify)				

• **PATIENT CONSENT**

MY SIGNATURE BELOW INDICATES THAT I AM CONSENTING TO HAVE A GENETIC TEST FOR HEREDITARY HAEMOCHROMATOSIS AND THAT THE IMPLICATIONS OF SAME HAVE BEEN FULLY EXPLAINED TO ME.

PATIENT SIGNATURE

DATE

13.4 Urgent Requests

To request that any specimen is processed urgently, please contact the laboratory to ensure the specimen is expected and testing of the specimen is prioritised.

13.5 Storage of Examined Specimens

FBC and coagulation samples are retained for 7 days. Bone marrow films are retained permanently.

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13.6 Requesting Additional Tests

Subject to individual analyte stability, further tests on a specimen that is already in the laboratory can be requested by sending a request form stating the patient's details and additional tests required. Requests should be signed by the requesting doctor and contain the doctor's bleep number. Note, however, that ESR and D-dimer analysis cannot be performed on specimens >4hrs old.

13.7 Analytical Failure

Analytical failure may be caused by specimens which are:

- Clotted
- Insufficient
- Haemolysed
- Grossly Lipaemic.

In such cases repeat specimens may be requested.

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13.8 Reference Ranges

Full Blood Count	Range	Units	Comments
White Blood Cells (WBC)	4.0-11.0	$\times 10^9/L$	
RBC Red Blood Cells (RBC)	4.32-5.66	$\times 10^{12}/L$	Male
	3.80-5.00	$\times 10^{12}/L$	Female
Haemoglobin (Hb)	13.0-18.0	g/dL	Male
	11.5-16.5	g/dL	Female
Packed Cell Volume (PCV) Haematocrit (Hct)	0.390-0.540	L/L	Male
	0.360-0.470	L/L	Female
Mean Cell Volume (MCV)	78.0-99.0	fL	
Mean Cell Haemoglobin (MCH)	27.0-33.0	Pg	
Mean Cell Haemoglobin Concentration (MCHC)	32.0-36.0	g/dL	
Red Cell Distribution Width (RDW)	11.5-14.5	%	
Platelets (PLT)	140-400	$\times 10^9/L$	
Neutrophils (Neut)	1.7-7.5	$\times 10^9/L$	
Lymphocytes (Lymph)	1.1-4.0	$\times 10^9/L$	
Monocytes (Mono)	0.2-1.1	$\times 10^9/L$	
Eosinophils (Eos)	0.04-0.50	$\times 10^9/L$	
Basophils (Baso)	0.00-0.40	$\times 10^9/L$	

Routine Haematology	Range	Units	Comments
ESR	1-20	mm/hour	
Reticulocytes (Retics)	50-100	$\times 10^9/L$	
Haptoglobin	0.7-6.8	g/L	
Infectious Mononucleosis Screen	Negative	N/A	
Malaria Screen	Negative	N/A	
Sickledex Screen	Negative	N/A	

Haemoglobinopathy Screen	Range	Units	Comments
Sickledex	Negative		
Haemoglobin A2	1.5-3.4	%	MMUH
Haemoglobin F	0.0-1.0	%	MMUH

Coagulation	Range	Units	Comments
Prothrombin Time (PT)	10.5-13.7	secs	
INR			
APTT	25.0-34.0	secs	
Derived Fibrinogen	1.7-5.2	g/L	
D-Dimer	0-250	ng/mL	

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Factor Assays	Range	Units	Comments
Factor II:C	0.75-1.35	IU/mL	NCHCD
Factor V:C	0.71-1.37	IU/mL	NCHCD
Factor VII:C	0.70-1.70	IU/mL	NCHCD
Factor VIII (Clotting)	0.60-1.36	IU/mL	NCHCD
Factor VIII (Chromogenic)	0.53-1.77	IU/mL	NCHCD
Factor IX:C	0.57-1.89	IU/mL	NCHCD
Factor X:C	0.78-1.42	IU/mL	NCHCD
Factor XI:C	0.72-1.53	IU/mL	NCHCD
Factor XII:C	0.52-1.64	IU/mL	NCHCD
Factor XIII:Ag	0.73-1.60	IU/mL	NCHCD

von Willibrands Screen	Range	Units	Comments
Factor VIII (Clotting)	0.60-1.36	IU/mL	NCHCD
VWF:Ag	0.49-1.73	IU/mL	NCHCD
VWF:RCo	0.55-1.56	IU/mL	NCHCD
VWF:CB	0.50-1.50	IU/MI	NCHCD
VIII:C / IX:C Inhibitor	0.0	BU	

Thrombophilia Screen	Range	Units	Comments
Antithrombin	0.82-1.18	IU/ml	NCHCD
APCR	>2.1	Ratio	NCHCD
Factor VIII	0.6-1.36	IU/mL	NCHCD
Factor V Leiden	G/G	N/A	Normal Wildtype NCHCD
	A/G	N/A	Heterozygote NCHCD
	A/A	N/A	Homozygote NCHCD
Fibrinogen	2.20-4.30	g/L	NCHCD
Lupus Anticoagulant	Negative	N/A	NCHCD
Protein C	0.74-1.32	IU/mL	NCHCD
Protein S	0.76-1.46	IU/mL	Male - NCHCD
	0.65-1.33	IU/mL	Female - NCHCD

Other Coagulation Examinations	Range	Units	Comments
Prothrombin Gene Type	G/G	N/A	NCHCD
Anti Xa – prophylactic range	0.03-0.3	IU/ml	NCHCD

MMUH – Mater Misericordiae University Hospital

NCHCD – National Centre for Hereditary Coagulation Disorders, St James' Hospital

www.stjames.ie/Labmed/

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14 HISTOLOGY

14.1 Introduction

The Histopathology Department provides an extensive Histopathology service to Connolly Hospital Blanchardstown and Our Lady's Hospital Navan. Cytopathology (Non-Gynae) including a Fine Needle Aspirate service and an Autopsy service are also provided by the Histopathology Laboratory.

14.2 Materials Supplied by Histopathology Laboratory

The following may be obtained from the Histopathology laboratory:

- Specimen containers – various sizes.
- 10% Neutral Buffered Formalin (in 5 L containers)
- Pre-filled 60ml and 180ml 10% Neutral Buffered containers.
- Histology transport bags
- Slides and slide containers with fixative for Fine Needle Aspirates (FNAs).
- Slides
- Slide holders
- Spray Fixative
- Coplin jars of alcohol (Fixing FNA smears)
- Histopathology / Cytopathology request cards.
- Biohazard bags

SAFETY: Formalin is a potent eye and nasal irritant and can cause respiratory distress and allergic dermatitis. Gloves, goggles and aprons should be used when dealing with formalin. Contact the Histopathology Laboratory for any additional information that may be required and if a formalin spillage should occur.

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14.3 Specimen Requirements

The techniques that are performed on fresh tissue are affected by the length of time that the tissue is removed from the patient before it is received for analysis. It is imperative that all tissue samples required to be sent fresh should be done so immediately.

Note: The turn around time of specimens for Histopathology will vary depending on the nature of the specimen. The following is an outline of estimated turn around time for different specimen types from time of receipt in the laboratory. This is only a guideline and the complexity of a case and the requirement for further investigations may lengthen the turn around time.

14.3.1 Histopathology

Tissue Type	Fixative Required	Special Requirements	When Available	Turnaround Time
Specimen for Frozen Section*	Send fresh to the laboratory – immediately.	24 hours notice Required Details supplied with the specimen must include a bleep number / Theatre number.	Routine Hours: 9.00 – 17.00 Monday to Friday Out of Hours: By prior arrangement with Consultant Pathologist only.	20 minutes
Specimens for DIF	Where possible, send two specimens – one in 10% Neutral Buffered Formalin and one wrapped in saline moistened gauze.	Please supply relevant clinical details. Sample must be received so that it can be sent and received by Beaumont Immunology Laboratory by 2.30pm.	Routine Hours	Contact Immunology Laboratory, Beaumont Hospital.
All other tissue	Send in 10% Neutral Buffered Formalin	An adequate volume of formalin in a specimen container of suitable size is essential for proper fixation. The volume of formalin used should be at least twice the volume of the tissue to be fixed. Large specimens should not be sectioned or opened.	Routine Hours	Biopsies – 3 days Resection specimens – 3-5 days

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Tissue Type	Fixative Required	Special Requirements	When Available	Turnaround Time
Urgent Specimens	As above	Other urgent specimens are dealt with on an individual basis. The laboratory should be contacted directly with these requests in order to ensure that they are handled appropriately.	As above	Urgent biopsies <24 hours Urgent surgicals <48 hours

*Specimens from patients with TB, HIV or Hepatitis B or C infection should not be sent for frozen section. If such a suspicion is present, the medical staff concerned must inform laboratory personnel in order to safeguard the laboratory staff from risk of infection. In addition, if the laboratory inadvertently processes such specimens, a decontamination procedure of the equipment required for frozen sections must be carried out. Decontamination of this equipment takes 12 hours. During this time no further frozen sections can be performed.

14.3.2 Cytopathology

Note: The turn around time of specimens for Cytopathology will vary from 24 hours to 4 days depending on the nature of the specimen and the complexity of the case.

Specimen	Specimen Collection	Special Requirements	When Available
Bronchial Brushings	Place material in a sterile container.	Include time sample collection	Routine Hours
Sputum	Take a deeply coughed early morning specimen into a sterile container.		Routine Hours
Fluids (Pleural, Ascitic, BAL etc)	Place material in a sterile container. At least 20mls of fluid is required for diagnosis.	Include time sample collection	Routine Hours
Urine	Place in a sterile container. Total voided specimen is required for cytology.	The first morning specimen is not suitable.	Routine Hours
Fine Needle Aspiration Cytology	Smears made from FNA material received from clinics must be clearly labelled with patient name and at least one other form of ID (Chart number / DOB) in pencil.	Pathologists will perform FNA's on request. Contact Histopathology office.	Routine Hours
Cerebrospinal Fluid for Cytology	Specimen must be collected in a sterile container labelled with patient and specimen details.		Routine Hours

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14.4 Completion of the Request Form

All specimens must be accompanied by a request form. Regardless of the tissue type the following essential information must be supplied **LEGIBLY**:

- Name of patient (as per specimen container)
- Date of Birth / Healthcare Record Number (as per specimen container)
- Anatomical location of the specimen

The request form should also contain:

- Address of the patient
- Name of consultant of care or requesting GP
- Patient Location (Ward / OPD)
- Date sample taken
- Relevant clinical details (Cytology samples - query malignancy)

The requesting clinician is responsible for the correct labelling of request forms.

14.5 Labelling of Specimens

14.5.1 Labelling of Specimen Containers

Regardless of the tissue type the following essential information must be supplied **LEGIBLY** on the body of the specimen container:

- Name of patient (as per specimen container)
- Date of Birth / Healthcare Record Number (as per specimen container)
- Anatomical location of the specimen
- If multiple specimens are taken for a given patient, each specimen container must be individually labelled as to the site of origin e.g. A, B, C, D etc.

The requesting clinician is responsible for the correct labelling of specimens. **Incorrectly or inadequately labelled specimens are not accepted by the laboratory and will be returned to the source of origin.**

14.5.2 Labelling of Smears

Smears made from FNA material must be clearly labelled with the patient's name and at least one other form of ID (Healthcare Record Number / DOB) in pencil.

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14.6 Request Forms

All histology and cytology requests must be accompanied by a Histopathology and Cytopathology Request Form.

LF-HIS-0031 HISTOPATHOLOGY / CYTOLOGY REQUEST FORM 12/1				CONNOLLY HOSPITAL BLANCHARDSTOWN	
Patient's Chart No.:		Location:		Lab No.:	
Surname:	Sex:				
First Name:	Priority:	Cons / G.P.:		Send report to:	
Date of Birth:					
Address:		Date / Time:	Requested by: (Dr. Signature)		Bleep No.:
SPECIMEN LOCATION AND SOURCE			CLINICAL DETAILS		
			(This section MUST be completed)		
Previous Histology / Cytology No's if available:			Yes / No	Date and Time Received	

14.7 Transport of Specimens

14.7.1 Transport of Specimens from within Connolly Hospital

- The laboratory operates a collection service from Theatre at 10.00 and 16.00.
- There is one collection on Saturday morning at 12.00 from Theatre.
- Specimens from other areas of the Hospital are delivered by Hospital porters.
- Urgent specimens delivered to the laboratory should be accompanied by a log book which must be signed by the recipient.

14.7.2 Transport of Specimens from General Practitioners

Specimens can be delivered directly to the Pathology Specimen reception or posted to the Histopathology Department. If diagnostic specimens in 10% formalin are posted the following guidelines and instructions must be adhered to.

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1. The specimen should be placed in watertight containers containing 10% Neutral Buffered Formalin (volumes larger than 125ml should not be transported by post but hand delivered to the laboratory), the lid must be securely closed to avoid leakages. Patient's details entered on container and request form as above. Specimens must be packaged in a UN-approved packaging system (UN3373/4GU/Class 6.2/05 GB) which consists of three layers:
 - a) **Primary Receptacle:** a labelled primary watertight, leak-proof receptacle containing the specimen. The receptacle is wrapped in enough absorbent material to absorb all fluid in case of breakage.
 - b) **Secondary Receptacle:** A second durable, watertight leak-proof container to enclose and protect the primary receptacle(s). Several wrapped primary receptacles may be placed in one secondary receptacle. Sufficient additional absorbent material must be used to cushion multiple primary receptacles.
 - c) **Outer Packaging:** The secondary container is placed in an outer shipping package which protects its contents from outside influences such as physical damage and water while in transit. Specimens should be addressed to the Histopathology Department.
2. Both the recipient's and the sender's name and address must be shown on the packaging so that contact can be made in the event of a leakage.

14.8 Retention Times for Specimens

The Histopathology and Cytopathology Departments retains Specimens / Blocks / Slides in accordance with the Royal College of Pathologists Guidelines (Royal College of Pathologists and Institutes of Biomedical Science. The retention and storage of pathological records and archives. 4th Ed 2009. Available from: www.rcpath.org).

Storage of examined histopathology specimens is as follows:

- 1) cytology specimens retained for a minimum of 8 weeks from receipt
- 2) formalin fixed surgical and biopsy specimens retained for a minimum of 10 weeks from receipt
- 3) frozen tissue retained permanently
- 4) tissues retained until reporting is complete.

14.9 Requesting Additional Tests

Requests for additional histopathology and cytology examinations are made by the Consultant Histopathologists or Histopathology Registrars only.

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14.10 Compromised Samples

Where compromised samples (e.g. specimen received with no formalin) are accepted the final report will indicate the nature of the problem and if applicable that caution is required when interpreting the results.

14.11 Reports

Printed authorised reports are sent to the Clinical Consultant, source (wards / OPD) or requesting GP. Reports are available by phoning the Histopathology Office at 5352 / 5353 Monday to Friday 9.00 -17.00. Reports are not available in the laboratory. Unauthorised reports and any issues of clinical concern can be discussed with the registrar or consultant involved in the case.

14.12 Autopsy Services (Post Mortems)

The Histopathology Department provide an autopsy service. Autopsies may be performed at the request of the clinical staff responsible for the care of the patient or under the direction of the Coroner.

Written consent from the next of kin on the appropriate post-mortem examination consent form is required for non-Coroner cases (i.e. “Hospital” or “House” cases) before an autopsy is performed.

In Coroner’s cases the Post Mortem Information form detailing the nature of the procedure and giving the name and number of a family member must be completed.

Circumstances where a death should be reported to the Coroner are listed below.

If an autopsy is required, the clinical staff must inform the Mortuary Technician at extension 5475 / 5426 / Bleep 224. Policies relating to obtaining consent for autopsy are outlined in the Mortuary Policies document. For “consented” autopsies (so called non-Coroners or “House Cases”) it is the responsibility of the individual who requests the autopsy to ensure the completed consent form, patient case notes and a concise clinical summary are delivered to the Mortuary in order for the autopsy to be performed. In the case of deaths outside normal working hours, the individual who obtained consent for autopsy must ensure that the relevant documentation is given to the Mortuary Technician the following morning.

In Coroner’s cases it is the responsibility of the clinical team to notify the Coroner and to ensure that the “Information Form” is completed.

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14.12.1 Death which must be reported to the coroner.

(a) Deaths occurring at home or other place of residence:

Where the deceased was not attended by a doctor during the last illness;

Where the deceased was not seen and treated by a doctor within one month prior to the date of death;

Where death was sudden or unexpected;

Where death may have resulted from an accident (regardless of length of time between injury and death), suicide or homicide;

Where the cause of death is unknown or uncertain;

Where concerns are expressed by any person in relation to a death.

(b) Deaths occurring in hospital:

Deaths occurring in the accident and emergency department and individuals dead on arrival at hospital;

Deaths occurring within 24 hours of admission;

Where a patient dies before a diagnosis is made and the general practitioner is also unable to certify the cause;

When death occurred while a patient was undergoing an operation or under anaesthesia or within 24 hours of same;

Where death occurred during or as a result of any procedure;

Where any question of negligence or misadventure arises in relation to the treatment of the deceased;

Where death resulted from an industrial disease;

Where death was due to neglect or lack of care (including self neglect);

Where death occurred in a Mental Hospital;

Where death may have resulted from an accident (regardless of length of time between injury and death), suicide or homicide.

Where a patient has MRSA, C.Diff. or VRE

Where a patient is resident in a long stay unit or nursing home.

(c) A death is reported to the coroner by a member of the Garda Siochana:

Where death may have resulted from an accident, suicide or homicide;

Where death occurred in suspicious circumstances;

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Where death is unexpected or unexplained;
Where a dead body is found;
Where there is no doctor who can certify the cause of death.

(d) Other Circumstances

Sudden infant deaths;
Where a body is to be removed out of Ireland.

A detailed list of reportable deaths is available in the “The Role of the Coroner in Death Investigation”.

It is the responsibility of the most senior member of the medical staff attending the patient to ensure that the death is reported to the Coroner.

14.13 Consent for Limb Disposal

Policy for Care and Handling of Specimens in the Theatre Department must be adhered to. Contact the Histopathology Laboratory. LF-HIS-0012 Consent for Limb Disposal (available from the Histopathology Laboratory) must be completed by the Surgical team.

14.14 Procedures for Conferences

Details are outlined below of the conferences, their frequency and where they are held. Names for the conferences must be forwarded to the Histology registrar at 5395 or faxed to the laboratory at 8207747 at least 2 working days before the date of the conference.

Meetings:

- **Oncology Clinicopathology meeting:**
Thursday 7.45-8.45 am in the lecture theatre in The Academic Centre.
- **GI Clinicopathological meeting:**
Thursday 12.45-2.00 pm in the lecture theatre in The Academic Centre.
- **Haematology / Histology meeting:**
Thursday 10.00-10.30 in the Haematology Laboratory in the Pathology Department.
- **Lymphoma meeting:**
Beaumont Hospital - 1st Thursday of every month 8am
- **Thyroid meeting:**
1st Tuesday of every month at 12:30pm in The Education Centre.

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15 MICROBIOLOGY

15.1 Specimen Requirements

- Microbiology results depend critically on the type and quality of the material received. Therefore material sent for microbiological examination should be both representative and fresh.
- Specimens must be sent to the laboratory as soon as possible after collection. Non-urgent specimens, **other than blood cultures**, taken out of laboratory hours may be refrigerated prior to delivery.

Examination	Container / Swab Type Required	Specimen Collection & Transport Recommendations	Analysing Laboratory	When Available	Turnaround Time*
Midstream (MSU) or Catheter (CSU) urine - Microscopy, Culture and Sensitivity	Sterile MSU container.	Transport to laboratory promptly. Refrigerate if delay in transport is likely. Minimum volume: 1ml	Connolly - Microbiology	Routine & On-call Hours	24 hrs for a negative 48 hrs for a positive
Early Morning Urine (EMU) (Pregnancy) (HCG)	Sterile MSU container	Transport to laboratory promptly. Refrigerate if delay in transport is likely. Minimum volume: 1ml	Connolly - Microbiology	Routine & On-call Hours	2-3 hours
Urine for Chlamydia	Sterile MSU container	Collect first 10-15ml of first catch urine (first part of the stream). Transport to laboratory within 24 hrs of collection.	NVRL	Routine Hours	3 days
Urine for Legionella or Pneumococcal Antigen	Sterile MSU container	Minimum volume: 1ml	Connolly - Microbiology	Routine Hours	2-3 hours
Early Morning Urine (EMU) for Mycobacteria	Sterile MSU containers	Collect full void of Early Morning Urine, then send a 20 - 50 ml aliquot of this in a sterile MSU container	Public Health Laboratory, Cherry Orchard Hospital	Routine Hours	6 weeks
Wound Swabs for Culture and Sensitivity	Transystem transport swab	Ensure there is adequate material on the swab. Pus is the preferred sample when available – see below.	Connolly - Microbiology	Routine Hours	48 hours

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Examination	Container / Swab Type Required	Specimen Collection & Transport Recommendations	Analysing Laboratory	When Available	Turnaround Time*
Pus	Sterile MSU container.	Transport rapidly to laboratory. Minimum volume: 1ml	Connolly - Microbiology	Routine Hours	72 hours
Fluids	Sterile MSU container. Also send EDTA sample if cell count and differential is required.	Transport rapidly to laboratory. Minimum volume: 1ml	Connolly - Microbiology	Routine Hours	48 hours
Eye Swab (Bacterial)	Transystem transport swab		Connolly - Microbiology	Routine Hours	48 hours
Ear Swab (Bacterial)	Transystem transport swab		Connolly - Microbiology	Routine Hours	48 hours
Throat Swab (Bacterial)	Transystem transport swab	Swab areas of purulence or ulceration. Specify if looking for diphtheria or pertussis.	Connolly - Microbiology	Routine Hours	48 hours
Throat or other Swab (Viral)	Viral Transport swab	Swabs available from Microbiology	NVRL	Routine Hours	Refer to: www.ucd.ie/nvrl
Nose Swab (Bacterial)	Transystem transport swab		Connolly - Microbiology	Routine Hours	48 hours
MRSA Screens	Transystem transport swab	See MRSA Policy.	Connolly - Microbiology	Routine Hours	48 hours
High Vaginal Swab	Transystem transport swab	MUST be received during routine hours, otherwise unsuitable for wet prep microscopy & other results questionable	Connolly - Microbiology	Routine Hours	48 hours
Umbilical Swab	Transystem transport swab		Connolly - Microbiology	Routine Hours	48 hours
Urethral / Endocervical Swab (Bacterial)	Transystem transport swab		Connolly - Microbiology	Routine Hours	48 hours

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Examination	Container / Swab Type Required	Specimen Collection & Transport Recommendations	Analysing Laboratory	When Available	Turnaround Time*
Urethral / Endocervical Swab (Chlamydia)	Aptima Chlamydial collection device	Must be sent in chlamydial collection device available with instructions from the Microbiology laboratory. Follow collection instructions carefully.	NVRL	Routine Hours	Refer to: www.ucd.ie/nvrl
Vulval Swab	Transystem transport swab		Connolly - Microbiology	Routine Hours	48 hours
Sputum (Routine Bacteriology)	Sterile MSU container	Note: Salivary or mucosalivary samples are not suitable for routine culture except from ICU or immunosuppressed patients. Please send only purulent or mucopurulent samples. Minimum volume: 1ml	Connolly - Microbiology	Routine Hours	48 hours
Sputum for TB	Sterile MSU container	For optimal diagnosis, the first specimen on 3 consecutive mornings is preferred. Separate specimens and request forms are required for routine culture and TB testing. Minimum volume: 1ml	Public Health Laboratory, Cherry Orchard Hospital	Routine Hours	Contact Public Health Laboratory, Cherry Orchard Hospital
Bronchoalveolar Lavage	Sterile MSU container	Use sterile container.	Connolly - Microbiology	Routine Hours	48 hours
Cerebrospinal Fluid (C.S.F)	Sterile Universal Containers x 3	At least 1-2 ml required. Take sample into three sterile universal containers, clearly marked 1, 2, and 3 in order of sampling. Notify laboratory in advance when a lumbar puncture is planned and send specimens immediately when taken. Do not send via pneumatic tube system. Please notify the laboratory in advance.	Connolly - Microbiology Beaumont - Microbiology	Routine Hours 08.00 – 18.00 Mon – Fri Sat 09.00 – 12.00 Sun 09.00 – 10.30 On-call	48 hours

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Examination	Container / Swab Type Required	Specimen Collection & Transport Recommendations	Analysing Laboratory	When Available	Turnaround Time*
Faeces for Bacteriology, Virology or Ova / Parasites	Sterile MSU container	Transport immediately. If any delay in transport anticipated, refrigerate specimen. Testing for Ova / Parasite is not indicated for in-patients except in cases of recent foreign travel. Contact laboratory in advance if sending fresh stool for Entamoeba. Minimum quantity: 1-2 g	Connolly – Microbiology (some specific tests are sent to external laboratories)	Routine Hours	48 hours
Faeces – Blood Stained (High Risk)	Sterile MSU container	Transport immediately. If any delay in transport anticipated, refrigerate specimen. Minimum quantity: 1-2 g	Public Health Laboratory, Cherry Orchard Hospital	Routine Hours	Contact Public Health Laboratory, Cherry Orchard Hospital
Faeces for Clostridium difficile toxin.	Sterile MSU container	Fresh specimen required. Refrigerate if delay in transport to laboratory anticipated. Testing for C. difficile toxin is not indicated in formed or semi-formed faeces. Minimum volume: 2-3 ml loose / liquid specimen	Connolly - Microbiology	Routine Hours	48 hours
Faeces for Occult Bloods	Sterile MSU container	This test is carried out on the wards. OPD and GP patient samples processed in laboratory.	Connolly - Microbiology	Routine Hours	2-3 hours
Vomit	N/A	Unsuitable for culture.	N/A	N/A	N/A
Sellotape Slides for Threadworm	Glass slide	Tape sellotape to slide then place in a specimen bag.	Connolly - Microbiology	Routine Hours	2-3 hours
Skin scrapings and clippings for fungal culture	Dedicated transport system if available; otherwise sterile container	Scrape skin at active edge of lesion, place in a dedicated transport system or sterile container. Protect specimen from light.	Biomnis Laboratory	Routine Hours	Refer to www.biomnis.ie

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Examination	Container / Swab Type Required	Specimen Collection & Transport Recommendations	Analysing Laboratory	When Available	Turnaround Time*
Central Line Tips	Sterile MSU Container	Remove aseptically. Cut distal 4cm off.	Connolly - Microbiology	Routine Hours	48 hours
Wound Drain Tips	N/A	Not recommended for culture. Needle aspirate of fluid or abscess preferred.	Connolly - Microbiology	Routine Hours	48 hours
Urinary Catheter Tips	N/A	Unsuitable for culture, send MSU or CSU as appropriate.	N/A	N/A	N/A
Biopsy Tissue	Sterile MSU container	Keep specimen moist e.g. in sterile gauze moistened with sterile water. Transport rapidly to laboratory. (Do not use formalin or other preservative).	Connolly - Microbiology	Routine Hours	72 hours
Blood Cultures	Aerobic + Anaerobic blood culture bottles.	Bottles are supplied in sets of two - one blue (aerobic) & and one purple (anaerobic) from the microbiology laboratory. Cleanse top of culture bottles with 70% alcohol e.g. Sterets. Place 10mls of blood aseptically into each of culture bottles, taking care not to introduce contamination. Do not change needles to inoculate second bottle. Transport to laboratory as soon as possible. Do not refrigerate.	Connolly - Microbiology	Routine Hours	5 days
Samples from High Risk Patients e.g. TB	See individual sample types	See individual sample types	Beaumont - Microbiology	Routine Hours	See individual sample types above. Contact Microbiology Laboratory, Beaumont

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Examination	Container / Swab Type Required	Specimen Collection & Transport Recommendations	Analysing Laboratory	When Available	Turnaround Time*
Serology (Antibody Studies) & Virology Testing on blood samples - all tests except those marked * (see below)	1 x 7.5ml Plain Tube - Peripheral Blood		NVRL	Routine Hours On-call – for urgent needlestick or organ donation investigations	Refer to: www.ucd.ie/nvrl
*HIV PCR, CMV PCR, CD4, CD8, Hep C Viral Load	1 x 2.7 ml EDTA – Peripheral Blood	Must be sent to the laboratory within 4-6 hours of collection	NVRL	Routine Hours	Refer to: www.ucd.ie/nvrl
*HIV Viral Load	2 x 2.7 ml EDTA – Peripheral Blood	Must be sent to the laboratory within 4-6 hours of collection	NVRL	Routine Hours	Refer to: www.ucd.ie/nvrl
*Hep C PCR	1 x 7.5ml Plain Tube - Peripheral Blood	Must be sent to the laboratory within 4-6 hours of collection	NVRL	Routine Hours	Refer to: www.ucd.ie/nvrl
*Meningococcal PCR	1 x 2.7 ml EDTA + 1 7.5ml Plain Tube – Peripheral Blood CSF		CUH, Temple St.	Routine Hours	Refer to www.cuh.ie
*Needlestick Injury Follow-up	*Contact Occupational Health	*Contact Occupational Health	NVRL	Routine Hours On-call – if authorised as urgent by consultant Microbiologist	Refer to: www.ucd.ie/nvrl
Bone Graft Swabs	Transystem transport swab	Use Cappagh Hospital request forms	Cappagh Hospital	Routine Hours	Contact Laboratory Cappagh Hospital

* Average turnaround times are based on a best case scenario; weekends are not taken into account. Turnaround times will be longer when specific organisms are isolated.

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- All specimen container lids must be securely tightened prior to transportation to ensure safe arrival in the laboratory. Containers should be checked for cracks or faults before use. Never overfill containers.
- All samples must be packaged in zip lock bags or other sealed plastic bags and must be kept separate from the request form.
- Sample containers, request forms or plastic transport bags which are contaminated with any biological material will not be accepted for processing by the laboratory.

15.2 Request Forms

Where several examinations are requested, separate request forms and samples are required for each type. Relevant clinical information, antimicrobial therapy, details of foreign travel may be essential for the accurate microbiological assessment. It is essential to specify clearly the specimen site – failure to do this may mean that the specimen cannot be processed.

15.2.1 Microbiology Request Form

All hospital in-patient and out-patient requests for microbiological examination must be made on the Microbiology request form LF-MIC-0067.

LF-MIC-0067 MICROBIOLOGY REQUEST FORM EDITION 00 EXT 5303 CONNOLLY HOSPITAL, BLANCHARDSTOWN			
Patient's Chart No.:		Specimen (Clearly Specify Type And Site)	Test(s) Requested
Sumame:	Gender: M / F		
First Name:	Location For Report	Relevant Clinical Details	Antibiotic Therapy (Time of last dose essential for antibiotic assay requests)
Date of Birth:	Consultant		
Address:	Doctors Signature	Date / Time Taken: (Time essential for antibiotic assay requests)	Lab No.
	Bleep No.		
N.B. IF REQUEST IS URGENT, THE LABORATORY MUST BE PHONED IN ADVANCE			
LAB USE ONLY			
Labelled By:		Request Entry By:	Checked By:

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15.2.4 GP Request Form

All non-hospital / GP patient requests must be made on the GP request form.

CONNOLLY HOSPITAL, BLANCHARDSTOWN DUBLIN 15, IRELAND		G.P. REQUEST FORM Essential criteria *		PATHOLOGY LABORATORY LF-GEN-0015	
MRN (If available)		Doctor's Name*		Lab No	
Surname*		Doctor's Address*		Type of Specimen	
First Forename*			Time Taken*		
Patient's Address*		Date Taken*		Relevant clinical details and therapy:	
ETHNIC ORIGIN		Emergency Phone No.* (For critical reports)			
D.O.B.*	Gender*				
APPOINTMENTS FOR BLOOD TESTING Telephone (01) 6465365					
GP Usa	Biochemistry	Endocrinology	Haematology	Immunology/Virology	Microbiology
8 hour fast for: Glucose, GTT	<input type="checkbox"/> Renal <input type="checkbox"/> Liver <input type="checkbox"/> Bone	<input type="checkbox"/> TFT <input type="checkbox"/> Ferritin <input type="checkbox"/> Vitamin B12 <input type="checkbox"/> Serum Folate <input type="checkbox"/> PSA <input type="checkbox"/> Other	<input type="checkbox"/> FBC <input type="checkbox"/> INR (Warfarin) <input type="checkbox"/> Coag Screen <input type="checkbox"/> Other		<input type="checkbox"/> Urine (C/S) <input type="checkbox"/> Sputum (C/S) <input type="checkbox"/> Stools (C/S) <input type="checkbox"/> MRSA Screen <input type="checkbox"/> Nose <input type="checkbox"/> Groin <input type="checkbox"/> Other Site
12 hour fast for: Lipid	<input type="checkbox"/> Lipid (min 12hr fast) <input type="checkbox"/> Cholesterol fast / random <input type="checkbox"/> Iron Studies <input type="checkbox"/> Glucose fast / random <input type="checkbox"/> Other				<input type="checkbox"/> Swab <input type="checkbox"/> Throat <input type="checkbox"/> HVS <input type="checkbox"/> Other Site
Food and drink not allowed except for water and prescribed medication if required.					<input type="checkbox"/> Other
FASTING <input type="checkbox"/>	Lab No	Lab No			
Labelled by:	Result entered by:		Checked by:		

15.3 Urgent Requests

To request that any specimen is processed urgently, please contact the laboratory to ensure the specimen is expected and testing of the specimen is prioritised. The Microbiology Laboratory must always be notified, at Ext 5303 during routine hours or Bleep 158 out of hours, in advance when planning to take a CSF (lumbar puncture) sample. **Please specify a bleep number on all urgent requests.**

If cell counts and/or gram stains are required urgently, the Microbiology Laboratory must be notified in advance to request that these results are phoned.

15.4 Storage of Examined Specimens

Primary samples including swabs and microbiological samples other than urines and CSFs are retained for 1 week. CSF samples are retained for 2 weeks. Urine samples are retained for 2 days.

15.5 Requesting Additional Tests

Requests for add-on HCG, urine Legionella or Pnuemococcal antigen may be added by phone and an additional request form must be sent to the laboratory. Requests for other further investigations are made in consultation with the Consultant Microbiologist.

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