Primary Specimen Collection Manual

(Pathology User Manual)

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# 1 Introduction

This manual is designed to give an overall view of the services provided by the pathology department. This manual is intended for users of the pathology service both within the hospital, and those from outside agencies.

In January 2018 the National Maternity Hospital implemented the Maternal Newborn – Clinical Management System (MN-CMS). This replaced the existing paper patient health record with an electronic Powerchart for obstetric and neonatal patients. This was further extended for all Gynaecological patients in September 2019.

## The Quality Policy of the Pathology Laboratory at the National Maternity Hospital

The Department of Pathology and Laboratory Medicine is committed to promoting and providing the highest quality diagnostic and consultative services for all its users. The department is committed to the implementation of the National Maternity hospital mission statement.

The quality policy is implemented by the following means:

1. Implementation of a quality management system, the purpose of which is to review and continuously improve the quality of the services provided.
2. Setting quality objectives and plans to implement the quality policy and ensure it is appropriate to the purpose of the hospital.
3. Ensuring that all staff are familiar with the quality policy through publication of the quality manual to ensure user satisfaction.
4. Treating health and safety as a prime focus for both staff and visitors.
5. Upholding professional values and good professional practice.
6. Complying with all environmental legislation

The department will comply with the standards set by International standard ISO 15189, AML-BB, EU Directive 2002/98/EC, HIQA and INAB for the services and tests defined in the quality manual and is committed to:

1. Staff recruitment, training and development at all levels to provide an effective and efficient service to its users.
2. Providing and managing resources to ensure that laboratory examinations are processed to produce the highest quality results possible and fit for intended use.
3. Reporting results in ways, which are timely, confidential, accurate and are supported by clinical advice and interpretation when required.
4. Implementation of internal quality control, external quality assessment, audit and assessment of user satisfaction to continuously improve the quality of the service
5. The safe testing, distribution and transfusion of blood and blood components

## Guide to Using This Manual

A controlled up to date electronic version of this manual is available hospital wide in Q-PULSE software. Any printed copies are uncontrolled documents.

### Using the “Table of Contents” for Navigation

One can navigate to any part of this document by holding down the CTRL key while also left clicking with the mouse in the appropriate area of the table of contents at pages 1-4 of this document.

## Pathology Department Telephone Numbers

Insert (01)637 before extension number for direct access from outside the hospital

Figure 1: General Pathology Telephone Numbers

|  |  |  |
| --- | --- | --- |
| General Pathology | **Contact Name** | **Phone/ Bleep** |
| Director of Pathology  And Consultant Pathologist | Dr Eoghan Mooney | Ext: 3181 or contact on mobile phone through hospital switch |
| Laboratory Manager | Marie Culliton | Ext : 3313  Mobile 086 796 9647 |
| Laboratory Administration | Mary McAlinden | Ext : 3531 |
| Pathology Department Fax Number | N/A | 676 5048 |
| Quality Officer | Deirdre Duggan | Ext :3187 |
| Specimen Reception  Specimen Dispatch |  | Ext:3178/3545  Fax:637 3410 |
| Medical Scientist Emergency On-Call | Rotational | Bleep 101  Mobile:086 385 3277 |

Figure 2: Anatomic Pathology Telephone Numbers

|  |  |  |
| --- | --- | --- |
| [Anatomic Pathology](#_Anatomical_Pathology_(Histology)) | **🡨 [CTRL + Click on link to go to dept. details]** | **Phone/ Bleep** |
| Consultant Pathologists | Dr Eoghan Mooney  Dr Paul Downey  Dr David Gibbons | Ext: 3181  Ext: 3135  Ext: 3531 |
| Chief Medical Scientist | Paula Whyte | Ext:3263 |
| Senior Medical Scientist | Declan Ryan  David Mahon | Ext: 3180 |
| Routine Laboratory |  | Ext: 3531/3180 |
| Senior Pathology Technician | John Long | Ext: 3531 |
| Reports/Administration | Mary McAlinden | Ext: 3531 |
| Pathology Registrar | Rotational | Ext: 3252 |

Figure 3: Biochemistry Telephone Numbers

|  |  |  |
| --- | --- | --- |
| [Biochemistry](#_Biochemistry_DEPARTMENT) | **🡨 [CTRL + Click on link to go to dept. details]** | **Phone/ Bleep** |
| Consultant Clinical Chemist | Ms Orla Maguire | Ext: 3490 / 3546  (01) 2214607(SVUH) |
| Chief Medical Scientist | Catherine Doughty | Ext: 3546 |
| Senior Medical Scientist | Damian Lally  Philip Clarke | Ext: 3546 |
| Routine Laboratory |  | Ext: 3546 |
| Emergency On Call | Medical Scientist On Call | Bleep: 101  Mobile:086 3853277 |

Figure 4: Blood Transfusion Telephone Numbers

|  |  |  |
| --- | --- | --- |
| [Blood Transfusion](#_BLOOD_TRANSFUSION_DEPARTMENT) | **🡨 [CTRL + Click on link to go to dept. details]** | **Phone/ Bleep** |
| Consultant Haematologist | Dr. Joan Fitzgerald | **Routine**: (01) 2213125  Ext: 3382(SVUH)  **Emergency**: On Call Haematology Consultant (Speed Dial) 17301(SVUH) |
| Chief Medical Scientist | Natalie Keogh (on-leave)  Orla Cormack (Acting) | Ext: 3547 |
| Senior Medical Scientists | Mary Anderson  Donal Noonan  Aoife Reynolds | Ext: 3547 |
| Routine Laboratory |  | Ext: 3547 |
| Emergency On Call | Medical Scientist On Call | Bleep: 101  Mobile:086 3853277 |
| Major Haemorrhage Emergency Phone |  | Ext: 3584 Diverts to emergency mobile out of hours |
| Haemovigilance Officer | Bridget Carew | Ext: 3569 Bleep 095 |

Figure 5: Haematology Telephone Numbers

|  |  |  |
| --- | --- | --- |
| [Haematology](#_HAEMATOLOGY) | **🡨 [CTRL + Click on link to go to dept. details]** | **Phone/ Bleep** |
| Consultant Haematologist | Dr. Joan Fitzgerald | **Routine**: (01) 2213125  Ext: 3382(SVUH)  **Emergency\***: On Call Haematology Consultant (Speed Dial) 17301(SVUH) |
| Chief Medical Scientist | Luke Mac Keogh | Ext: 3548 |
| Senior Medical Scientist | Laura Kennedy | Ext: 3548 |
| Routine Laboratory |  | Ext: 3548 |
| Emergency On Call | Medical Scientist On Call | Bleep: 101  Mobile:086 3853277 |

Figure 6: Microbiology Telephone Numbers

| [Microbiology](#_Microbiology_Laboratory) | **🡨 [CTRL + Click on link to go to dept. details]** | **Phone/ Bleep** |
| --- | --- | --- |
| Consultant Microbiologist | Dr Susan Knowles | Ext: 3578 or  Contact on mobile phone through hospital switch |
| Chief Medical Scientist | Anya Curry | Ext: 3179 / 3533 |
| Specialist Medical Scientist | Gráinne O’Dea | Ext 3179/ 2004 |
| Surveillance Scientist | Carol O’Connor | Ext: 3179 / 3533 |
| Senior Medical Scientist | Gwen Connolly | Ext: 3179 / 3533 |
| Microbiology Office |  | Ext: 3179 |
| Routine Laboratory |  | Ext: 3533 |
| Molecular Microbiology |  | Ext: 2004 |
| Emergency On Call | Medical Scientist On Call | Bleep: 101  Mobile:086 3853277 |
| Virology Dispatch |  | Ext. 3178 |
| Virology Results |  | Ext: 3178/3179/3533 |

## Location of Pathology Departments

Figure 7: Department Location

|  |  |  |
| --- | --- | --- |
| **Department** | **Location** | **POD Station No.** |
| **Anatomic Pathology** | Above the outpatient clinic in the main hospital building. | **11** |
| **Biochemistry** | Blood Sciences laboratory on the ground floor in the new wing of the hospital. | **12** |
| **Blood Transfusion** | Blood Sciences laboratory on the ground floor in the new wing of the hospital | **12** |
| **Haematology** | Blood Sciences laboratory on the ground floor in the new wing of the hospital | **12** |
| **Microbiology** | The Microbiology Laboratory is located in the basement of the new wing of the hospital | **13** |
| **Specimen Reception** | Ground floor of the new wing of the hospital. Beside Blood Sciences laboratory | **12** |

## Pathology Department Opening Hours

Figure 8: Department Hours

|  |  |
| --- | --- |
| **Department/Activity** | **Opening Hours** |
| **Routine Service** |  |
| Monday to Friday All Departments with the exception of Anatomic Pathology | 08:00 - 18:00  08:00 - 17:00 |
| **Saturday**  (Biochemistry, Blood Transfusion, Haematology and Microbiology) | 09:30 -13:00  A reduced service is provided on Saturday  (Specimens should reach the laboratory before 12.00) |
| **Emergency out of hours service**  *(Biochemistry, Blood Transfusion, Haematologyand Microbiology only)* | (On call emergency diagnostic service) **Pod station 12** |
| **Monday to Thursday** | 18:00 – 08:00 the following day |
| **Friday** | 18:00 – 09.30 Saturday |
| **Saturday** | 13.00 –9.30 Sunday |
| **Sunday + Bank Holiday:** | 09.30-08.00 the following day |
| **Sunday of Bank Holiday Weekend** | 09.30 - 09.30 the following day |

## Advisory Services

Advisory services and clinical advice are available at consultant level 24 hours a day, seven days a week via ‘on site’ consultants or through telephone support either from the ‘in house’ consultants or via agreed support. Memoranda of understanding have been agreed between the consultants in the department of pathology and laboratory medicine and consultant colleagues. Frequency of requesting examinations is a clinical decision and can be discussed at consultant level (see section 1.3 for contact details).

## Requesting Tests

The requesting clinician can order a test/s or blood products either by using a request form and labelling the sample container or by ordering electronically on MN-CMS and attaching the generated barcode label to the sample.

MN-CMS is used for all patients of NMH.

In the event MN-CMS system is unavailable or it is not possible to make a request through MN-CMS, staff can revert to use of paper request forms.

The requesting clinician must complete the appropriate request in full, including clinical details. The personal information received is treated as confidential in line with the hospital policy on personal information

**It is the responsibility of the requesting clinician and person collecting patient specimens to ensure that request is correctly completed, the sample taken from the correct patient and the correct label attached.**

### Routine Requests

For routine examination of specimens:

* Fill out required fields on appropriate request form(either paper or electronic)
* Note: Anatomic Pathology require the electronic printed requisition form
* Attach addressograph label to paper request form (if used)
* Take specimen into correct container
* Label specimen correctly using MN-CMS generated label or manually
* Transport to laboratory via
  + POD (except for histology specimens)
  + Direct delivery or leave for porters collection

### Urgent Requests during Routine Hours

* Urgent specimens should be clearly marked by writing or selecting Urgent on the request form.
* Telephone the appropriate laboratory ([for correct extension numbers see section 1.3](#_Pathology_Department_Telephone)). **Specimens may not be processed as urgent unless laboratory staff have been alerted by telephone.**
* When the specimen arrives into the laboratory it is brought to the attention of the medical scientistand processed in rapid mode according to local policies available in individual departments.

### Pathology On-Call Services

The Out of Hours Service is reserved for **non-deferrable** analysis of specimens.

The service should meet the clinical need for safe patient care.

The necessity to take a sample prior to instituting treatment does not always imply that the result is required urgently.

Before requesting a test to be analysed ‘out of hours’ a clinician should consider:

* Will the result, whether high, low or normal affect my diagnosis?
* Will the result, if available early, affect treatment?

For more information on the services provided Out of Hours please see PP-CS-LM-24 Laboratory Out of Hours Service.

#### Scientist On-Call

The emergency ‘Out of Hours’ covers the Biochemistry**,** Haematology, Blood Transfusion and Microbiology departments. The Medical Scientists providing the ‘out of hours’ service are ‘on call’ and have completed a full day’s work prior to starting on-call.

The service is multidisciplinary. The Medical Scientists ‘on call’ cover all laboratories rather than the department in which they are based during the day. While extensive training and competency assurance is in place, scientists cannot be expected to know the answers to all questions clinicians may have. Clinical advice is available 24/7 through telephone contact with consultants.

It is essential that requests are restricted to emergency samples only. Where demand is high processing of samples will be prioritised and/or processed in batches

There are 2 Medical Scientists covering the ‘out of hours’ service at all times.

#### Accessing the Service

The on-call medical scientist requires notification of emergencies via the bleep or on call mobile.

**Pager 101**

**Mobile 086 3853277**

**Send samples to Pod Station 12**

#### Tests Available ‘On Call’

The tests outlined below are available ‘out of hours’. Please note contents of comment section for specific requirements. For tests not listed below, approval from the laboratory manager (Mobile 086 7969647) is required.

Figure 9: Tests 'On Call'

| **Department / Test**  **‘On Call’** | **Comments** |
| --- | --- |
| **Blood Transfusion** |  |
| Group and Coombs Paediatric | Available when bilirubin is raised or result is required for blood or product issue.  When Cord Bloods were not received and the mother is RhD Neg and may require Anti-D urgently.  When a maternal antibody is present and Cord bloods are not available for testing i.e. Maternal antibody first identified post natally / transfer baby |
| Blood Group and Antibody screen | Request must be on the crossmatch request form. LF-BTR-XREQ Rev 3  Or request form printed from MN-CMS  Out of hours Type and Screen samples will only be processed for patients with the following clinical details.  1. Crossmatch request or request for the provision of Blood Products.  2. Unbooked or 1st time presentation  3. Ectopic  4. Placenta Previa  5. Placenta Accreta  6. Known immune antibody  7. Transfusion Reaction Investigation  8. For patients where blood products may be required e.g. PPH / Emergency LSCS and there is not a valid sample available. |
| Provision of Blood Products | In accordance with MBOS and Major Haemorrhage pathway or by specific request. Please note that the Blood Bank must be informed when patients with known immune antibodies are admitted to allow adequate time to source suitable blood products. |
| ***Please note on Sundays and Bank Holidays one batch of Cord Blood samples and Anti-D requests will be processed each morning for all samples received in the Laboratory before 9.30am.*** | |
| Cord Blood | Not available except for the presence of maternal antibodies, where DCT is then urgent, or when approaching 72hrs post natal. |
| Prophylactic Anti-D Ig Issue | Issued in response to suspected sensitizing event if approaching 72 hours or if there is an uncertainty about the patients commitment to return. Sample for group and screen must be drawn prior to request. |
| Transfusion Reaction Investigation | Limited testing can be made available based on the transfusion reaction type and the intention to continue to transfuse. |
| **Biochemistry** |  |
| **Note: PN bloods must be in the Laboratory by 08:00am, results will be available by 09:30am. They should not be drawn before 07:00am.** | |
| Albumin |  |
| Alkaline Phosphatase(ALP) |  |
| Amylase |  |
| Aspartate Transaminase (AST) |  |
| Alanine Transaminase (ALT) |  |
| Bilirubin-Direct |  |
| Bilirubin-Total |  |
| Calcium |  |
| Chloride |  |
| Creatine Kinase (CK) |  |
| Creatinine |  |
| C Reactive Protein (CRP) |  |
| CSF : Glucose + Protein |  |
| Glucose |  |
| Lactate Dehydrogenase (LDH) |  |
| Magnesium |  |
| Osmolality (plasma + urine) |  |
| Phosphate- inorganic |  |
| Potassium |  |
| Sodium |  |
| Total Protein |  |
| Triglycerides |  |
| Urate |  |
| Urea |  |
| Urinary Protein:Creatinine ratio |  |
| Hypoglycaemic Screen | Call the Laboratory. See Hypoglycaemic Workup request form RF-CS-BIO-41, available on Q-Pulse for details of all samples required. |
| **Haematology** |  |
| Coagulation Screen | Specific factor assays available by Consultant request |
| FBC | Low platelet counts reviewed for clumping in accordance with protocol. Urgent film review available in accordance with protocol. |
| Blood Film | Available by Consultant request if urgent |
| **Microbiology** |  |
| Blood Culture | Incubating bottles and processing of positive bottles; culture and Gram stain |
| CSF | Cell count, Gram stain and culture |
| MSU | Microscopy and culture, upon request |
| Paediatric urines | Microscopy and Culture |
| Pregnancy Test | POCT available in Casualty, OPD and Unit 4; manual hCG available as per policy |
| Rapid GBS(GeneXpert) | Monday – Friday: No on-call runs available  Saturday: 1 run per day at 20.30  Sunday / Bank Holiday: 2 runs per day at 12.30, 20.30 |
| Rapid Flu/RSV(GeneXpert) | Monday – Saturday: 1 run per day at 20.30  Sunday/ Bank Holiday: 2 runs per day at 12.30, 20.30 |
| Sars-CoV-2 (GeneXpert) | On-call testing for symptomatic patients, or those going for imminent surgery under general anaesthetic **only** (NMH and RVEEH). |
| **RVEEH** | **Specific services for RVEEH** |
| Blood Culture | Incubating bottles and processing of positive bottles for culture and Gram stain |
| Vitreous / Aqueous Tap in Paed Blood Culture | Incubating bottles and processing of positive bottles for culture and Gram stain |
| Corneal Scrapings | Incubation of inoculated plates for bacterial and fungal culture |
| *Neisseria gonorrhoea* culture | Incubation of inoculated plates |
| **Virology** |  |
| Varicella | Samples will be sent out @ 9.30am the following morning with the courier. Please phone the lab to inform them of the urgent sample. On occasion, if approaching 10 days post exposure event, the sample may be sent out before the next day. |
| Urgent Booking Bloods  (HIV, HEP B, HEP C) | For patients in labour only. |
| Occupational Blood Exposure | Please phone the lab to inform them of urgent sample. Samples will only be processed by the NVRL out of hours with approval by the NVRL medical team. Samples will not be analysed if status of source is known. |

### 

### Verbal Request Policy by Department

Figure 10: Telephone Request Policy

| **Department** | **Policy** |
| --- | --- |
| **Anatomic Pathology (Histology)** | Anatomic Pathology will not accept telephoned requests as all requests must be accompanied by the appropriate request form. |
| **Biochemistry** | Routine specimens are retained in the Biochemistry laboratory for up to 5 days, refrigerated at 2 – 6˚ C. Analyses of additional tests are subject to specimen integrity and analyte stability. Add on facility only available for routine biochemistry samples up to 8 hours from sample draw. Telephone requests for additional analyses are accepted from clinicians but must be followed up with the appropriate add-on request form. |
| **Blood Transfusion** | Urgent requests can be made by phone but should be followed up with the appropriate request.  Request for crossmatch can only be accepted if the inpatient Type & Screen sample is <72 hrs old and initialled as drawn and checked against armband. |
| **Haematology** | Haematology and coagulation specimens are usually kept for one week at 2 – 6˚ C after processing. Blood films are usually kept for 1 month after review or held at the request of the Chief / Consultant Haematologist. Analyses of additional tests are subject to stability of analyte. Refer to section 7.3 regarding time restraints from time of sampling to time of testing. If a further test is required on a specimen that is already in the laboratory which falls within the necessary time limit for retrospective testing, requests for additional analyses are accepted from clinicians but should be followed up with the appropriate add-on request form. |
| **Microbiology** | Additional tests can be requested by telephone provided specimen and request have already been received by the laboratory. Telephone requests are accepted from clinicians but should be followed up with the appropriate request form or as add-on test through MN-CMS. |

### Routine Cut off Times for Specimen Acceptance/Processing

Figure 11: Specimen 'Cut off Times'

|  |  |  |
| --- | --- | --- |
| **Laboratory Discipline/Location** | **Receipt of Specimen** | **Routine ‘Cut Off’ Time for Same Day Processing** |
| **Anatomic Pathology** |  | [See Specimen Requirements Figure 16. Below](#_Histopathology_Specimen_Requirement_) |
| **Biochemistry** | For same day processing | Mon – Fri:16:30hrs  Sat: 12:00hrs |
| **Blood Transfusion** | For same day processing | Mon – Fri: 15:00hrs  Sat: 12:00hrs |
| Specimens from patients for elective surgery | Mon – Fri: 16:00 hrs on the last normal working day prior to the scheduled surgery |
|  | Specimens from patients with PSE Anti-D Ig requests | Mon – Fri: 16:00hrs  Sat: 12:00hrs  Anti-D Ig requests outside these cut off times will be available at 11am Mon-Fri and 2pm Sat and Sun the following day providing the patient does not have immune antibodies |
| **Haematology** | FBC, reticulocytes and coagulation | Mon – Fri: 17:15hrs  Sat 12:00hrs  Routine specimens arriving after the cut off times may not be analysed until the next routine working day. |
| Specimens for: Malaria, IM, sickle cell, kleihauer and blood films for same day service. | Mon – Fri: 13:00 hrs  Sat: 12:00 hrs  Routine specimens arriving after the cut off times may not be analysed until the next routine working day. |
| **Specimens for Haematology Referral** |  | Specimens which reach the lab by 12:00hrs Mon – Fri will be referred on the same day. Routine referrals for St Vincent’s before 15:00 hrs.  Coagulation referrals that arrive after 15:00 hrs are not guaranteed processing unless by prior arrangement. |
| **Microbiology Specimens** | For routine processing | Mon – Fri: 17.45hrs  Sat: 12:00 hrs |
| C.S.F. specimens | Mon – Fri:16:30 hrs, for full processing by Microbiology scientific staff. |
| **Specimen Reception** | Receipt of Specimens | Mon – Fri only:17.00 hrs |
|  | Specimen Dispatch | Mon – Fri only:12:00hrs |

# Patient Identification

## Patient Consent

Please refer to the hospital guideline for obtaining patient consent before taking primary specimens.

### Anatomical Pathology Patient Information and Consent

Patient information leaflets are given to the patients before consent is sought for post mortem. Post mortem consent forms may only be signed by medical staff who have attended the laboratory induction programme. Consent for post mortems is only required for in house cases not coroners cases. All other patient information supplied by appropriate hospital department.

## Clinical Procedure for Patient Identification

Positively identify the patient by requesting verbal confirmation of surname, forename and date of birth. Verify that the details provided match that indicated on the hospital ID band for in patients. Check this name and date of birth matches the details on the laboratory request in the EHR request or request form. When the phlebotomist/clinician is satisfied that the patient has been fully and correctly identified, they can proceed to take the blood sample. Special vigilance is required for neonatal patients as verbal confirmation of identity is not possible.

Details for labelling should be taken from the patient’s wristband if worn. This applies for all inpatients and for all specimens taken for Blood Transfusion. Confirm demographic details verbally with adult patients.High risk patients must be marked with a red sticker.

Verify that the patient meets pre-examination requirements e.g. fasting status, medication status (time of last dose, cessation), sample collection at predetermined time etc. Note: Please refer to the hospital guideline for positively identifying patients before taking primary specimens.

### Neonates, Unconscious Patients and Patients Unable to Identify Themselves

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

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

### Identification of Foetus

In order to uniquely identify a Foetus, and link it to the mother the following is laboratory policy.

* Use the mother’s demographics for surname and address.
* Record the forename as “Foetus of” in front of the mother’s forename
* Where more than one pregnancy is recorded in a given year add the suffix B. e.g. Foetus 2009 B,
* Where more than one foetus is present in a pregnancy the forename should be Foetus Twin 1, Twin 2 etc. e.g. Foetus Twin 1 2009, Foetus Triplet 2 2009.
* The Hospital Number must be left blank for completion when the baby is born. As for patients without a Hospital Number the 1st line of the mother’s address acts as a mandatory identifier.
* The DOB is changed to the date of IUT.
* The Sex is changed from F to Unknown.
* Reports should be filed in the mother’s chart.

When the foetus is delivered – the baby is registered on the PAS system and assigned a Hospital Number and the previous IUT Winpath record is updated.

### Urgent Specimen from a “Moribund” (Unidentified) Patient

In the occasional event of an urgent specimen from a “moribund” patient, where identity cannot be confirmed the following essential information must be provided on both request form and specimen:

1. **Allocated identifier e.g. “Jane Doe”**
2. **Gender** (Sex)
3. **Date of specimen**

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

# Safety

The hospital safety statement [NMH Safety Statement] is available on Q-Pulse.

**THE LABORATORY USES STANDARD PRECAUTIONS WHEN HANDLING ALL PATIENT SPECIMENS.**

## General Safety Guidelines

* Always use approved specimen collection containers and ensure lids are securely closed.
* Observe standard precautions when taking patient specimens.
* Always dispose of sharps appropriately and according to the [NMH Safety Statement].
* Specimens must be placed in approved biohazard bag with request form placed separately in the sleeve provided as appropriate.
* Do not place specimen and form together in the same pouch of the biohazard bag.
* Always supply clinical information including known infection risk with each request.

Specific instructions on specimen transport are outlined in section 6 of this document. Model rules to ensure staff safety during specimen transport are outlined in section 6.2.2. Any spills must be dealt with in accordance with NMH Health and Safety Statement as well as Procedure for dealing with Biological Spills located in Q-PULSE.

## Venepuncture Procedure/Collection of Specimens

1. Wear appropriate PPE.
2. Observe hospital consent policy.
3. Reassure patient and briefly explain tests being taken. Ensure patient is comfortably seated and relaxed.
4. Ensure patients identification details are checked and correct in line with NMH Positive Patient Identification Policy.
5. Select **correct** specimen tubes.
6. Always use sample collection tubes, swabs etc. that are in date. Blood taken into expired collection tubes may render the specimen unsuitable. Specimen tubes must **NOT** be pre-labelled.
7. Rest limb on pillow or arm support and identify vein (in ante cubital fossa) for phlebotomy procedure.
8. Apply tourniquet and cleanse patient’s skin with a sterile skin wipe.
9. Inform the patient when you are about to venepuncture (described as a scratch).
10. Anchor vein if necessary and insert needle with bevel facing up.
11. Hold the vacutainer needle holder securely to allow change of tubes and collect required specimens. **Please note**: Samples for Blood Culture investigation must be drawn first to avoid contamination. See SI-NOT-GEN1 and SI-NOT-GEN2 for Order of Draw charts on Q Pulse.
12. When all specimens are collected, release tourniquet and withdraw needle smoothly and carefully.
13. Apply cotton wool to puncture site and ask patient to apply pressure for about 2 minutes keeping arm straight. This helps avoid, bruising/haematoma.
14. Push safety guard over needle to render safe and dispose of used needle immediately into sharps bin
15. Proceed to label the tube at the patient bedside

The above procedure is designed for adult patients. For neonatal patients the same general principles apply. Paediatric blood collection tubes are available.

**Summary**

Complete procedure with each patient.

1. Check patient identification.
2. Complete request
3. Venepuncture – collect specimens.
4. Label specimens correctly
5. Check specimens post collection to confirm PPID and labelling are correct.
6. For all Blood Transfusion specimens, ensure that the specimen is initialled to confirm that the above checks have been performed.
7. Place specimens in designated bag
8. Arrange for transport to lab.

Universal precautions should be observed when handling all pathological material. It is the responsibility of the requesting clinician to ensure that specimens which pose an infection risk to staff are clearly identified by a RED STICKER attached to the request form.

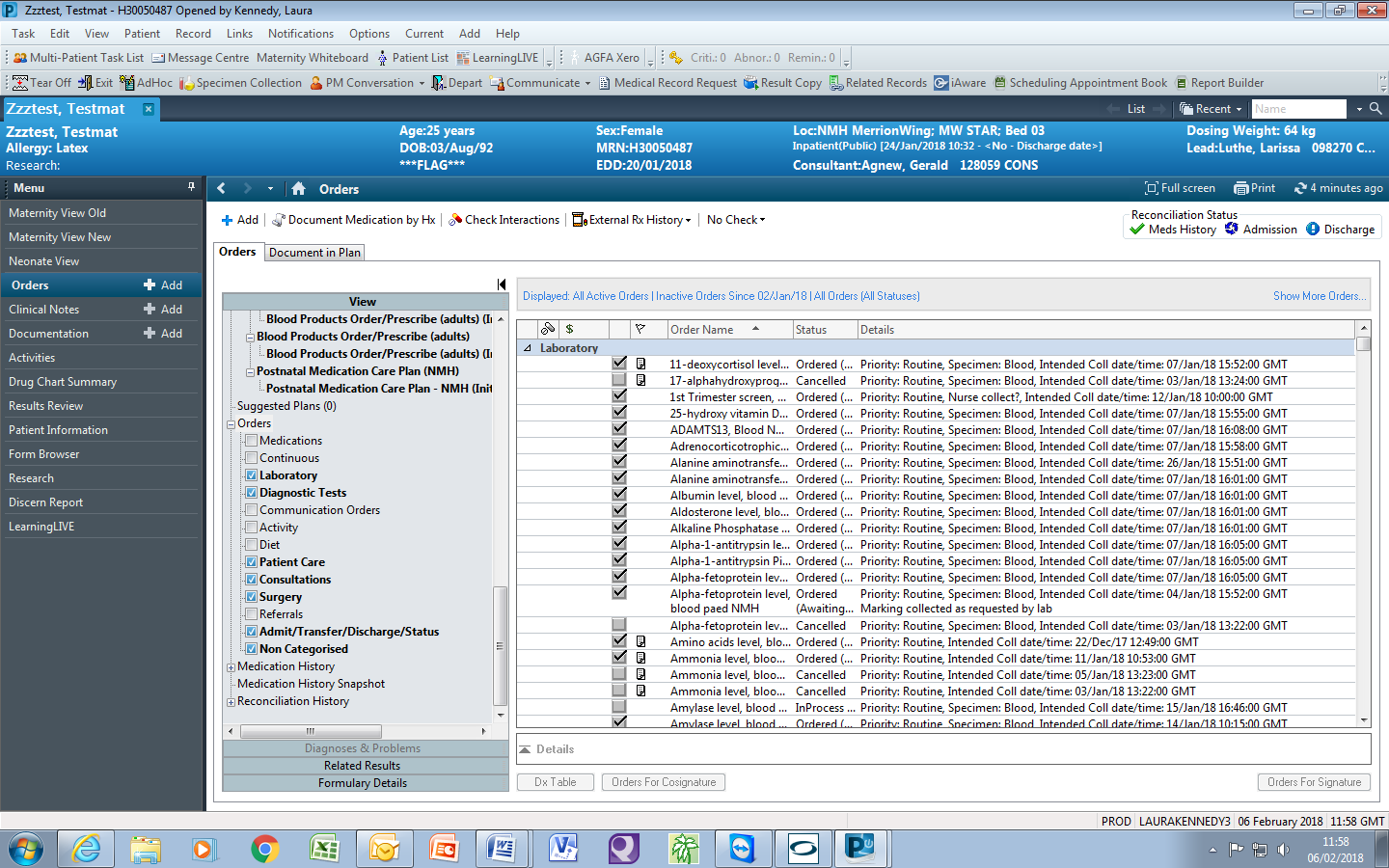
# Requesting Tests MN-CMS

## Electronic Requests MN-CMS

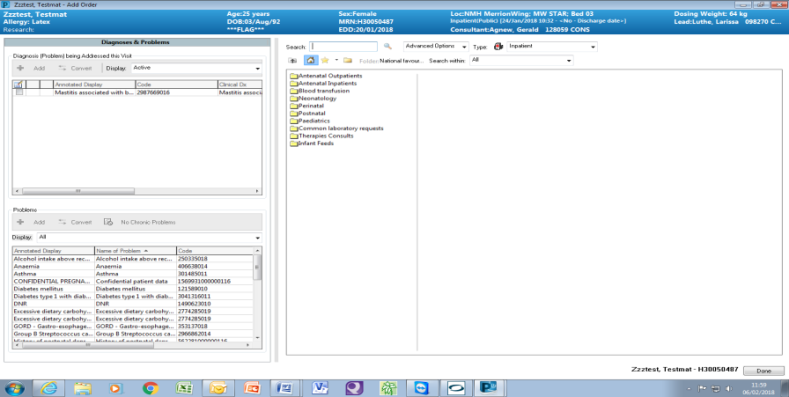
For Obstetric, Newborn and Gynaecological patients requests are placed via the orders module of the electronic chart MN-CMS

## How to Order tests through PowerChart

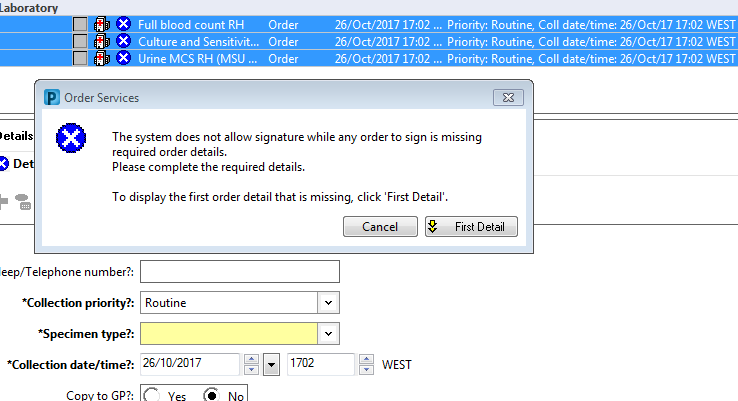
* All tests are ordered in the ORDERS tab on the left hand side.
* You can order a test by clicking on +Add in either of the places below

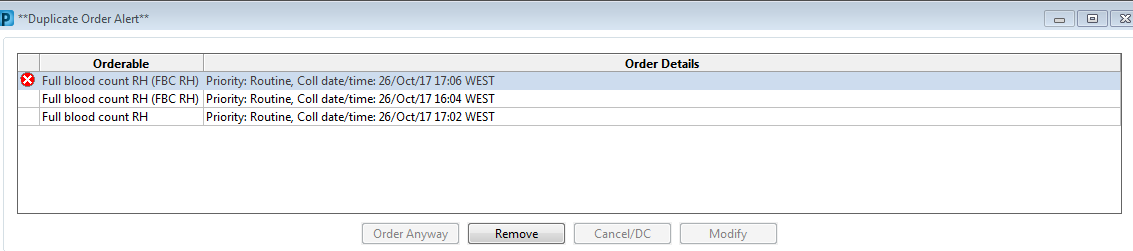


* Laboratory tests can be ordered using the search function. Type the **NAME OF TEST** required (see below for Name of Tests / in each Department) i.e. type FBC or Full Blood count or using the folders option (refer to appendix 3 for Microbiology orders list).
* You don’t always have to type in the full name as Millennium will filter as you type. Many of the NMH tests will have a suffix ‘N’ this is to differentiate a test done in the NMH from a test done elsewhere if a patient is transferred.



* Special requirements
  + If a test has any special requirements e.g. an external request form or frozen sample, a pop up alert will alert the user.
  + Click Ok to continue
  + This can be viewed subsequently by clicking on the document icon in the orders list
* Click ‘Done’ when **all** relevant tests have been selected. Failure to do so will mean that the tests were not saved for processing.
* Fill in the relevant clinical details appropriately. The laboratory will have to ring you for further information if not completed properly.
  + For Sars-CoV-2 requests, it is mandatory to supply the patient’s telephone number as per HSE and Public Health requirements. Please enter the phone number in the clinical details field.
* Please note all yellow fields and fields with \* are mandatory
* Put in your bleep etc. if you wish to be informed of any critical results.
* Collection priority – **Routine or Urgent** are the most common options for in-patients.
* Specimen type should default unless there are several options i.e. CSF, Blood etc.
* Collection date and time should automatically fill in. Adjust if necessary.
* If you get the pop-up message below it means that some of the tests require additional details.
* Click on **First Detail** to bring you to the next mandatory field.



* If a test has already been ordered on the patient then an alert box will appear (see below). This is telling you that an FBC has **already been ordered** for this patient within a predefined period dependant on the test in question. For some tests this may be a few hours and for others it could be days or even weeks. This is to reduce the number of inappropriate tests being repeated.
* For some tests you can select **Order anyway** if you know this has been ordered already but you want a repeat sample.
* For other tests such as genetic tests you will not be allowed to re-order the test as there is no clinical reason to do the test more than once. In this instance you will be asked to remove the request as it is a duplicate order.
* When all the tests have been ordered and all the required clinical details have been filled in, click sign. This will pull all tests in together and will only request the amount of tubes necessary to process what has been requested.

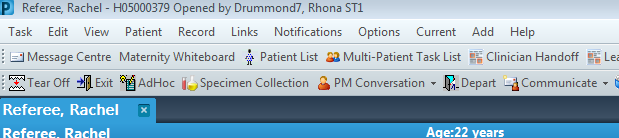
### Genetic Requests

Requests for genetic analysis can be placed electronically. The referral laboratory specific request form must be completed in addition to the electronic request.

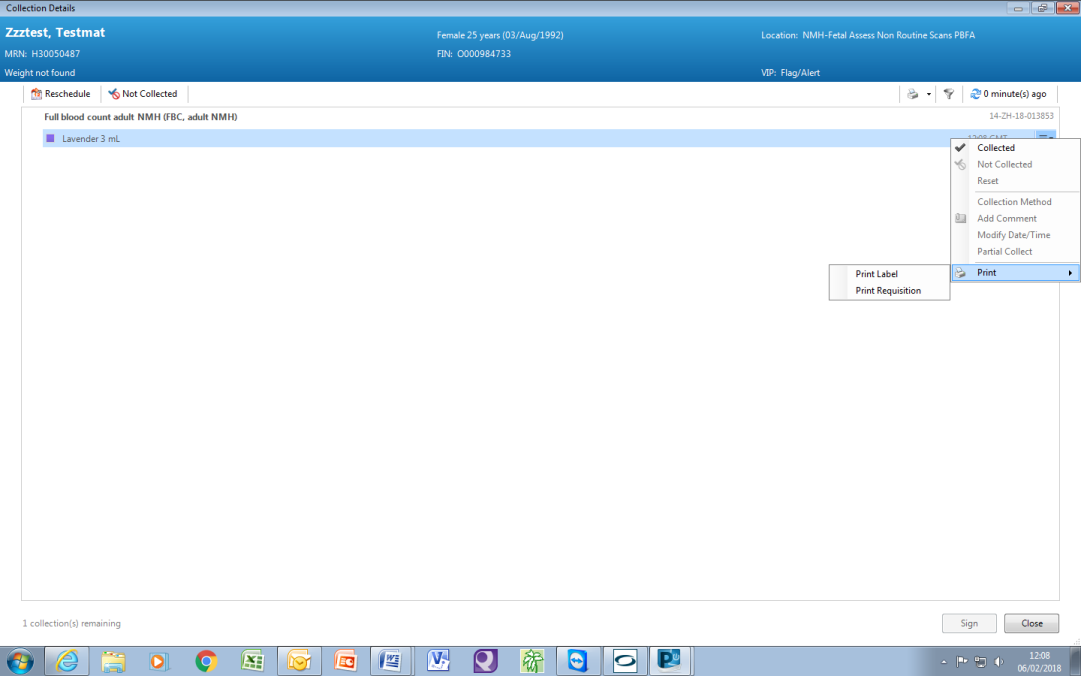
Please ensure correct consent has been obtained.

## Specimen Collection MN-CMS

* Once you have ordered the tests then it is very important to tell the system that you are taking the sample. Select **Specimen Collection** on the top menu.



* **You should then scan the patient id Band**. Failure to scan the id band for an inpatient will result in the test being rejected by the lab.
  + **For in patients the option to override the barcode scan has been removed**
  + For out-patients, if the patient does not have an ID band then you can select Unable to Scan barcode on the bottom left of the screen.
  + This option to override the barcode scan is removed for in patients
* A list of all tests requested on the patient will appear. Please note that some of these may not be relevant so please take note of the date and time of the samples on the right hand side. Only select the ones you wish to take
* *If you no longer wish to take a sample or are unable to take the sample, you must remove it from this list by clicking on the sample and selecting not collected and then stating why it is not being collected.*
* *The type of bottle required is also displayed on the left hand side. The volume is the volume of the sample container and not the volume of sample required. This will also print on the label.*
* **To collect a sample, you must print the label so right click on the sample type and select Print Label**
* Print the labels after you have taken the samples
* Please label the samples correctly, see section 4.5
* Check **ALL** samples post phlebotomy. Confirm samples have been labelled correctly; all patient demographics are present and confirm PPID between the patient and labelled specimen.
* **Mark the samples as collected and sign**
  + Failure to mark samples collected prevents the request being sent to the laboratory
* Initial the label as a final check to confirm all steps have been completed correctly.
* **Any duplicate MN-CMS requests printed in error must be discarded.**



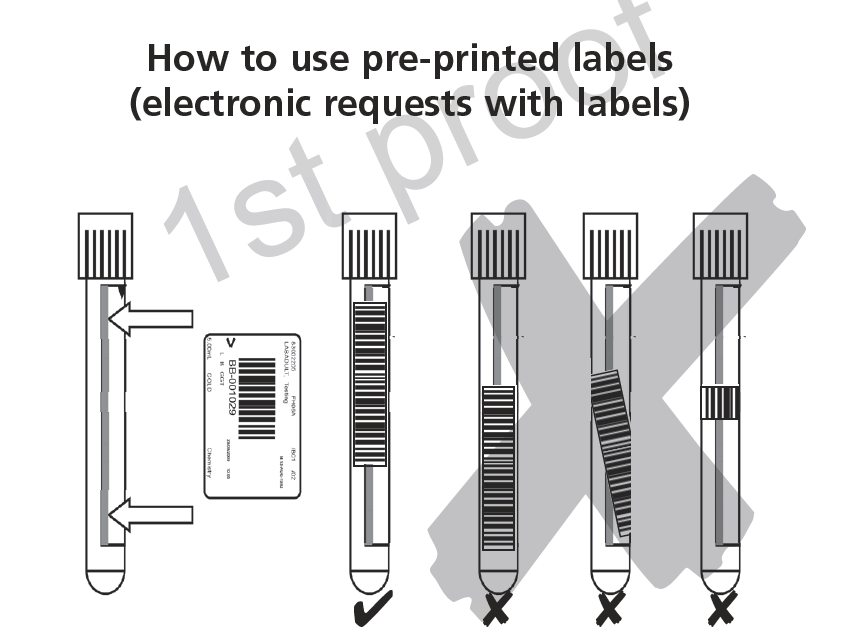
## Requests with No Specimen Collection

* Some requests do not require specimen collection. These tests require the printing of an A4 paper requisition
  + Blood Products
  + Blood Collection
  + Add On tests
  + Histology Placentae

**Unless a printed requisition is sent to the laboratory no request has been received**

* Complete the order as in 4.2 above
* The order is marked collected when signed
* Right click on the order
* Print the A4 requisition and send to the laboratory

## Specimen Labelling MN-CMS



* MN-CMS labels must be printed on-demand /directly before sample phlebotomy and labelling. This must take place with the patient in-situ.
* **A general rule of thumb is to cover the paper label already on the sample tube/swab etc.** Do not cover existing barcodes on **Blood Cultures**.
* Following application of an MN-CMS label – review the labelled sample to ensure the entire MN-CMS label is legible, the correct MN-CMS request has been placed on the correct sample type (as prompted by MN-CMS), the MN-CMS label orientation is satisfactory (see above) and the date and time of sample collection are correct.

**NB – Confirm the Patient Demographics on the MN-CMS label applied to the sample match the Demographics of the Patient on whom the sample has just been collected from. Compare labelled sample with Patient Wristband OR verbally confirm PPID if patient is not an In-Patient.**

* It is very important that you now change the status of the sample **to collected** and press sign. It is only after the sample is changed **to collected** that the request goes across to the lab system. The lab cannot process any samples that have not collected in MN-CMS The request will not transmit to the lab so we will not be able to process them.
* If the status of the sample is Ordered (Awaiting Collection) then you have not collected the sample inMN-CMS. The laboratory does not know that this sample has been ordered.
* The status of the sample will now change from Ordered to **Ordered (Collected**). This means that the sample has been taken but the laboratory has not yet formally received the sample
* When the lab formally receives the sample the status changes from **Ordered collected** to **In Process(Collected**). This means the laboratory has received the sample.
* **Discontinued** means that someone has chosen not to take the sample for some reason that is documented when the sample is cancelled.
* See 5.2.2 below for minimum specimen acceptance criteria for MN-CMS requests.

## Specimen Labelling in the event of MN-CMS printer failure

If a MN-CMS printer fails to print successfully first time from the MN-CMS cart you are using at the patient bedside **STOP. DO NOT send the MN-CMS request to any other label printer.** Complete the following steps;

* Perform Positive Patient Identification as per NMH PPID Policy (PP-OG-CRR-2**).**
* Manually label the specimen at patient bedside from the patients’ wristband (in patients) / MN-CMS EHR with the **patient name**, **hospital number**, **date of birth, date and time of sample phlebotomy and signature of the sample taker.**

**NOTE samples for Blood Transfusion MUST be handwritten**.

* Print the requisition for the sample from MN-CMS to an A4 printer located in your clinical area.
* Check the specimen. Confirm labelled correctly and correct PPID between sample / Electronic Health Record /patient.
* Confirm sample collection by clicking the *Collect Icon* on MN-CMS EHR.
* The A4 requisition is then retrieved– You must crosscheck the patient identifiers on printed form against the Patient handwritten identifiers on the sample tube.
* Check Date and Time of the order on A4 requisition form to ensure you have printed the correct order.
* Transfer the sample and form to the laboratory **TOGETHER.**

If unable to perform the above process successfully – the sample collector **must** revert to filling in a manual request form (refer to Section 5 below).

**This protocol applies for all samples where label printing at the patient’s side is not possible. Failure to adhere to this policy will be reported to Clinical Governance.**

**Follow up**

Unused MN-CMS requests may print when printer failures are resolved – it is essential these redundant labels are discarded.

The fault with the MN-CMS printer **must** be reported to the Ward Manager and IT Department at ext. 7999. Clinical areas are advised keep a record all printer failures.

# Requesting Tests: Paper Request

Paper based requests are used for patients in the event of MN-CMS failure and in external clinics without access to MN-CMS label printers.

## Consultant or Pathology Request Forms

The pathology department has a suite of controlled request forms which should be used to request investigations. The forms are department specific and are outlined in figure 10 below. Departmental forms may be obtained from the old lab and the current version of each departments forms are stored on Q-pulse, please use the reference number from figure 10 below or contact the relevant department for further information. External GPs that require sample bottles or forms can contact the Specimen Reception Department.

Dedicated request forms are available for use in external clinics without access to MN-CMS label printers. These requests **must** contain the valid registration number (either MCRN or NMBI) of the requesting clinician in order for them to be booked into Winpath.

Figure 12: Pathology Request Forms

| **Department** | **Form** | **Document Number** |
| --- | --- | --- |
| Anatomical Pathology | Gender determination form | RF-CS-AP-59 |
| Coroners Notification Form Organ Disposition Education and Research | RF-CS-AP-46 |
| Consent for Post Mortem (in house) | EXT-CS-AP-64 |
| Surgical request Form | LF-AP-SURGREQ |
| Placenta request form | LF-AP-PLACREQ |
| Blood Transfusion | Crossmatch Request Form, used for all inpatient requests | LF-BTR-XREQ |
| Group and Antibodies/ Group and Coombs Request Form | LF-BTR-GCREQ |
| Cord Blood (Group and Coombs) Request Form | LF-BTR-CRREQ |
| IBTS Fetal RhD Screen Referral Form | EXT-CS-BT-134 |
| Biochemistry | Biochemistry Request form | LF-BIO-REQ |
| Haematology | Haematology Request Form | LF-HAE-REQ |
| Microbiology | Microbiology Request Form | LF-MIC-REQ |
| Microbiology Request form from RVEEH | RF-CS-LM-78 |
|  | Microbiology External Clinics Request Form | RF-CS-LM-148 |
| External Referral | Serology Request Form. | RF-CS-SR-2 |
| Blood Sciences External Clinics Request Form | RF-CS-LM-147 |
| RVEEH Serology Request Form | RF-CS-SR-4 |
| TDL genetics request form. | EXT-CS-SR-1 |
| OLHSC Children’s Health Ireland at Crumlin genetic request form. | EXT-CS-SR-3 |
| Southern General Glasgow genetic request form.  Maternal Serum Screening Test form –Cambridge.  IBTS BT345 Request for red cell immunohaematology investigation.  NHIRL BT255-6 Request form for histocompatibility and immunogenetics investigation.  Request for Foetal Genotyping IBGRL.  Non Invasive Prenatal Screening | Please contact Specimen Reception for further information |

## Labelling the Primary Specimen and Filling in the Request Form

### Request Form

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

1. **Patients forename and surname**
2. **Hospital number**
3. Location/Contact details of the patient
4. Date of birth (or gestational age)
5. Patient’s sex
6. Destination for report
7. Clinician
8. Specimen type
9. Anatomic site of origin
10. **Examination requested**
11. Clinical information / history / relevant therapy
    1. ***For Sars-CoV-2: Contact telephone number is mandatory as per HSE/ Public Health requirements please ensure it is added to the request form for this test.***
12. Date and time of specimen collection
13. Date and time of sample receipt(laboratory only)

**a), b) and j) are essential requirements**

**In the event that the patient has no NMH Hospital Number the date of birth becomes an essential identifier.**

Large addressograph labels may be used for patient identification on the request form.

**Note:**For microbiology,specimen type or site, clinical details,antibiotic therapy details including allergiesare required on request form in order to process specimens correctly. Failure to provide such information can affect testing of sample (resulting in reduced or incorrect testing of sample).

Note: For Blood Transfusion samples, if no hospital number is available, the 1st line of the patients address must be present on the specimen, in addition to the patient’s forename, surname and date of birth, for the specimen to be accepted.

### Primary Specimen

#### Labelling of Primary Specimens

It is essential that all specimens are labelled with a minimum of three identifiers for Blood Transfusion, and two identifiers for other departments, in a legible manner on the specimen container. Always use sample collection tubes, swabs etc. that are in date. Blood taken into expired collection tubes may render the specimen unsuitable. Specimen tubes must **not** be pre-labelled.The following identifiers should be placed on the specimen:

1. **Patients forename and surname**
2. **Hospital number**
3. **Date of Birth (or gestational age)(for MN-CMS requests)**
4. Destination for report
5. Date and time of specimen collection
6. **Identity of specimen collector.**
7. Collection time.
8. **Specimen type (for MN-CMS requests)**
9. **Examination requested(for MN-CMS requests)**
10. **Initials of Specimen Collector (for MN-CMS requests)**

**a) and b) and are essential requirements for all laboratory departments,**

**a), b), c) f) and j) are essential requirements for Blood Transfusion.**

**In the event that the patient has no NMH Hospital Number the date of birth becomes an essential identifier.**

Note: For Blood Transfusion samples, if no hospital number is available, the 1st line of the patients address must be present on the specimen, in addition to the patient’s forename, surname and date of birth, for the specimen to be accepted.

All specimens for Blood Transfusion and Kleihauer testing must be hand written unless ordered via MN-CMS

Specimens for other laboratories should be labelled with small addressograph labels. Where no addressograph labels are available clear handwritten labelling is accepted.

### Labelling Criteria for Community/ GP Blood Transfusion Samples

The Blood Transfusion Laboratory will accept samples for Blood Group and Rhesus status from General Practitioners and Community based services like the Irish Family Planning Association for women within the NMH catchment area (South Dublin, Wicklow and Kildare) who are seeking termination of pregnancy.

The purpose of this Blood Group is to identify women who are Rhesus Negative and who will require prophylactic Anti D as part of her termination of pregnancy treatment.

**Blood Group**

Samples for blood group will be accepted from GP/ Community Care provided they meet all of the following criteria:

|  |  |
| --- | --- |
| **Specimen** | **Request form** |
| EDTA collection tube | Details of the GP, Full address and email |
| Sample Label (must be handwritten and signed by the person taking the sample) | Clinical details: Gestation is most important.  Please indicate if history of Anti D administration within last 3 months |
| Patient Full Name | Patient Full Name |
| Date of Birth | Date of Birth |
| 1st line of address | Complete address |

Where the samples and request forms do not conform to these requirements testing will not be possible

# Storage and Transport of Specimens

## Pre Analytical Specimen Storage

* Ideally all specimens should be transported to the Laboratory in a timely manner.
* Where this is not possible for example in an out of hours situation samples may be stored in a fridge. Specimens should be transported to the laboratory at the earliest possible time. See Departmental Sections for sample stability
* **Do not store the following sample types in the fridge:**

PCR**,** routine biochemistry, Coagulation, Blood Cultures, CSF samples, Inoculated plates, Surgical and placental specimens, Blood Transfusion samples for the Foetal RHD screen and specimens in formal saline – Keep at room temperature.

* Coagulation specimens must be sent to the laboratory ASAP as they are stable for only 4 hours
* Bacterial culture of *Neisseria gonorrhoea* - Samples must be brought to the laboratory immediately and staff notified – ***Processed during routine hours only.***
* Urine samples for Chlamydia / *gonorrhoea* testing **must** be delivered to the laboratory within 24 hours.
* Fresh tissue specimens must be refrigerated until they can be delivered to the laboratory.
* Body for post mortem must be refrigerated.
* Samples for HIV or Hep B PCR must be separated and frozen within 24 hrs of sample collection.
* Any EDTA sample received for NVRL, check with requesting unit if for PCR (in case EDTA sample taken in error), if so, spin, separate and freeze. EDTA samples are generally for PCR.

Majority of specimens for Microbiology are stable for up to 3 days once stored at 4˚ C.  Some exceptions apply for particular specimens and/or tests as follows:

## Specimen Transport

During the process of transporting patient specimens to the laboratory it is essential that specimens are transported safely and efficiently in order to:

* Ensure safe custody and integrity of the specimen which must reach the laboratory in proper condition.
* Specimens must be transported within a timeframe appropriate to the nature of the requested examinations and the laboratory discipline concerned. See individual disciplines for specific time frames.
* Specimens must be transported within a temperature interval specified for sample collection and handling and with the correct preservatives to ensure the integrity of the samples. Specimens received in the laboratory that do not conform to these criteria will be rejected, see section 3.
* Ensure the safety of staff transporting specimens Ensure the safety of other staff, patients and members of the public.
* The Pneumatic Transport System (POD), if appropriate to the specimen type, is the preferred method of delivery of specimens to the laboratory.
* Blood Culture bottles are plastic and may be transported via the POD.
* CSF samples must not be sent via the POD system, deliver to the laboratory by hand.
* **Histology specimens** must **not** be sent via the POD system

Please follow the following guidelines:

* Use approved specimen bags which must be sealed.
* Use approved specimen collection containers.
* Use the POD specimen transport system where available and appropriate to specimen type.
* Use the specimen transport boxes (closed) where appropriate.
* Do not try to carry multiple specimens by hand.
* Do not leave specimens in other locations en route to the laboratory.
* If there is a doubt about any aspect of specimen transport please contact the appropriate department for advice.
* Do not transport broken or leaking specimens.

### Specimen Transport Anatomic Pathology

#### Surgical Samples

* The laboratory porter collects samples twice daily from the Gynae Clinic.
* The theatre porter delivers samples to the laboratory twice daily, at 10:00am and 3:30pm and samples are signed for in the theatre day book.
* Samples delivered otherwise must be brought to the department by the requesting department.
* Samples must **not** be sent via the POD.
* When possible place sample in plastic biohazard bag.
* All urgent requests must be clearly marked by ticking the priority box on the request forms and must include the relevant clinical details.
* Frozen sections must be arranged in advance with the pathologist.
* All samples must be in adequate amounts of Formalin. Exceptions to this are, suspected cases of molar pregnancy and POC’s of recurrent (i.e. 3rd or subsequent) miscarriage which are sent up dry up until 17.00hrs Monday to Friday. All specimens after this time must be placed in fixative.

### Placental Samples

* An electronic order must be completed and sent to the lab with the specimen.
* The laboratory porter collects samples from the delivery ward in the morning.
* The theatre porter delivers the placental samples to the laboratory twice daily, 10:00am and 3:30pm and these are signed for in the theatre day book.
* All placentas from normal deliveries are examined by a midwife in the delivery ward. If there is no abnormality of pregnancy, labour, the placenta itself, or the immediate post-natal period, the midwife places the labelled full placenta in the placenta storage fridge located in the delivery ward.  These placentas are kept for a period of seven days. Where a clinician is requesting a placenta be processed they must check that there is an electronic order for the placenta in Cerner (this confirms we have the placenta) they may then send a placenta triage form with details of the request to the lab.  Where there is no electronic order one must be created and the placenta sample retrieved from delivery and sent with the order form to the lab.  All placenta requests must be made using the mothers hospital chart.
* The placenta is retrived by the laboratory porter.
* The full placentas of all multiple pregnancies are submitted to the Laboratory.
* Placentae for gross examination are placed in black bags, tied, labelled and placed in a biohazard bag. A placental triage form should be completed and sent with the specimen. Microscopic examination is based on findings of gross examination.
* Placentae from all high risk or sero-positive patients are placed in a suitable container filled with formalin and marked with a red hazard sticker. A placental triage form should be completed and sent with the specimen. Microscopic examination is based on findings of gross examination.

### Post Mortem

* Body must be placed in the mortuary fridge.
* Original forms must be sent to the laboratory.

## Transport of Potentially High Infectious Risk Specimens

***For patients at risk of haemorrhagic fever: The Pneumatic Transport System must NOT be used. Please contact the laboratory for specimen containment and transport boxes***

### Model Rules for Laboratory Porters and All Who Deliver Specimens to the Laboratory

(Refer to the Hospital Safety Statement)

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

1. Cover any cuts or grazes on your hands with a waterproof dressing.
2. Carry all specimens in the trays and boxes provided, not in your hands or pockets.
3. Touch specimen containers as little as possible. If you do touch them, wash your hands as soon as practicable afterwards.
4. Always wash your hands before meal breaks and at the end of duty.
5. If a specimen leaks into a tray or box, tell the laboratory reception staff and ask them to make it safe.
6. If you drop and break a specimen, do not touch it or try to clear up the mess. Stay with the specimen to prevent other people touching it and send someone to the laboratory for help. If you spill the specimen onto your overall, remove it at once and then wash your hands and put on a clean overall. Report the accident to your supervisor as soon as possible.
7. Handle specimen containers gently at all times.
8. Take care when carrying waste or rubbish from the laboratory – there may be broken glass or needles. If you find these tell your supervisor. Special “sharp” containers are provided for glass, syringes and needles – these must be handled carefully as leakage or penetration by sharp objects can occur.
9. All waste must be handled in accordance with all hospital health and safety policies.

## Specimen Location Delivery Instructions

Figure 13: Specimen Location Delivery Instructions

| **Location** | **Instruction** |
| --- | --- |
| Blood Sciences Laboratory(Routine)  Biochemistry, Blood Transfusion, Haematology and Specimen Reception. | \*Via pod to station 12 |
| Blood Sciences Laboratory**(Urgent/On Call)**  Biochemistry, Blood Transfusion and Haematology | \*Via pod to station 12.  Phone laboratory for urgent requests |
| Microbiology routine and urgent  (Except for blood culture specimens and CSF’s) | \*Via pod to station 13  Telephone 3533 if sending urgent samples |
| Microbiology: Blood culture | \*Via pod to station 12 |
| Microbiology: CSF’s | Do not use the POD to deliver CSF specimens to laboratory, deliver by hand, see section 6  Porter delivery (see section 6.2.2) |
| Microbiology: Sars-CoV-2 | Do not use the POD to deliver Sars-CoV-2 specimens to laboratory, deliver by hand, see section 6 |
| Microbiology On Call | \*Via pod to station 12 or delivery by hand to the Blood Sciences laboratory |
| Anatomic Pathology(Histology)  Frozen sections  Placental Specimens:  Post Mortem | Do not use the POD to deliver Histology specimens to lab. See section 6.2.4  Must be arranged in advance with the pathologist.  Porter Delivery (see section 6.2.2)  Body must be placed in the mortuary fridge.  Forms must be sent to the laboratory. |

\*If the pod system is not working deliver specimens directly to theappropriate areasee above.

# Specimen Acceptance Requirements

## Laboratory Criteria for Specimen Acceptance

Specimens and request forms must be labelled / filled in as per section 4 or 5 of this document. See below for rejection of specimens that do not meet the required criteria.

## Laboratory Criteria for Rejection of Specimens

Specimens that conform to the reasons listed below will be automatically rejected and will not be processed by the laboratory. A record of the specimen will be made in the Laboratory Information System and the reason for its rejection noted. A report will be sent to the clinical area. Where specimens originate from ‘in patients’ the requester if known, or the unit may be contacted and a repeat specimen requested.

### Reasons for Rejecting a Specimen

* Specimen received unlabelled.
* Specimen incorrectly labelled.
* Request form unlabelled
* Electronic request not completed
* Specimen and form do not contain minimum essential identifiers.
* Specimen and form do not contain the same essential identifiers.
* Specimen that has leaked extensively.
* Incorrect type of specimen.
* Incorrect volume of specimen.
* Specimen clotted inappropriately.
* Haemolysed specimens.
* Specimens received too old for analysis.
* Blood Transfusion specimens will be rejected if there is not an exact match between the essential identifiers on request and specimen
* Blood transfusion specimens with addressograph labels on specimens will be rejected.
* Blood transfusion specimens require the signature of the person who took the specimen and will not be accepted until this is supplied.
* All non MN-CMS specimens for Blood Transfusion and Kleihauer must be hand written
* Specimens will be rejected if the essential requirements are missing from the primary specimen.

**Special Considerations**

* Blood Transfusion specimens require date of birth (or gestational age) in addition to the full name and hospital number. Non MN-CMS Blood Transfusion samples must be signed by the collector.
* Note: For Blood Transfusion samples, if no hospital number is available, the 1st line of the patients address must be present on the specimen, in addition to the patient’s forename, surname and date of birth, for the specimen to be accepted.
* Anatomical Pathology and Microbiology specimens should be labelled on the body of the container and not on the lid.
* TDL, Glasgow, and OLHC genetic forms must be signed by the patient or person paying for the test.
* For post mortem examination the body should be identified by means of wrist or leg band

### Factors that May Affect the Performance of the Test / Interpretation of Results

* Incorrect volume of specimen.
* Specimen clotted inappropriately.
* Haemolysed/ Lipaemic specimens.
* Specimens received too old for analysis

### Exceptions to Rejecting a Specimen

In exceptional circumstances, where there are problems with patient/sample identification, sample instability due to delay in transport/inappropriate container/insufficient sample volume, or where the sample is clinically critical or irreplaceable e.g. in the case of surgical specimens in Anatomical pathology, CSF’s, amniotic fluid, CVS, pus from an abscess excised in theatre or other specimens (other than blood), the laboratory can choose to process the sample where both clinician and laboratory staff, following discussion, are confident regarding the identity of the specimen.

In this case the final report should indicate the nature of the problem and where applicable that caution is required when interpreting the result.

Corrections to labelling errors must be clear and unambiguous. Incorrect information must be indicated with a clear strikethrough. The correction must indicate the name of the clinical staff member contacted and bear their signature. It must be counter signed and dated by the laboratory staff member. A pathology specimen non-conformance form [RF-CS-LM-20] must be completed and a comment entered in the report alert the clinicians to the error. All samples with corrected labelling errors accepted for analysis are recorded as non-conformities and are subject to specific review.

The paper request forms are stored for three months in the laboratory and are then shredded. An exception to this is for Blood Transfusion, and genetic request forms where the request form is scanned and stored for 30 years. Anatomical Pathology request forms are stored for 30 years.

Electronic requests are stored permanently in the patient chart

## Sample Receipt

Trained Laboratory personnel will evaluate the specimens to ensure that they meet the relevant acceptance criteria.

MN-CMS samples are ‘booked in’ to the LIS on receipt into the laboratory using the unique bar coded number on the sample. The request date field in the LIS is the date and time the sample was received into the laboratory. In the event of MN-CMS printer failure – samples requested using MN-CMS are “booked in” to the LIS on receipt into the laboratory using the unique bar coded accession number on the A4 MN-CMS requisition. This unique accession number is then applied to the manually labelled specimen in the laboratory.

Samples with request forms received in the laboratory have the date and time of receipt recorded on the request form. Specimens are then labelled with a unique laboratory accession number; they are then recorded in the LIS linking the unique laboratory accession number to the patient’s details provided on the request form.

## Secondary Sampling of Primary Specimen

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

This is achieved by ensuring all sample containers are labelled with the patient’s unique laboratory accession number.

# Reports

## Reporting Of Results within the Hospital

Results, once authorised, are available electronically in MN-CMS or Winpath Ward Enquiry.

Hard copy reports are issued as required on the day of test report release.

Laboratory management shares responsibility with the requester for ensuring reports are received by the appropriate individuals within an agreed time interval, depending on the test requested. This is facilitated by the requester providing the necessary details on the request form, including clinical details. All clinicians have been alerted to this requirement via SI-MEM-LM-146.

### MN-CMS Reports

Reports are filed directly to the patient chart. In addition a message is received to the ‘In Box’ of the clinician placing the request and to the location pool message centre of the patient’s current, or last known, location.

Review of results is via an endorsement process. Results are reviewed and accepted by the reviewing clinician or are forwarded directly to the ‘in box’ of a Consultant or other designated clinician for action.

Reports for External Clinics will file directly to the patient’s MN-CMS chart. In order for a message to be sent to the inbox of the clinician requesting the test – the test request form must have been labelled with the valid registration number (wither MCRN or NMBI) of the requesting clinician. In the event the requesting clinician’s registration number has NOT been provided – it is the responsibility of the requesting clinician to review the report in the patient’s MN-CMS chart directly. Please note Hard Copy reports are also issued to External Clinics as standard (see below).

## Winpath Ward Enquiry

In general results once authorised are available electronically on the ward PC’s, within 20 minutes from time authorised. These results are accessed via the ward enquiry software Winpath Ward Enquiry. Entry of area logon and password provides access.

### Paper Reports

Hard copy reports are issued as standard for requests received on Paper Request Forms. These are delivered to the identified unit, or if none is given, to medical records twice daily (Monday to Friday) by the laboratory porter.

Results are reviewed and accepted by the reviewing clinician or are referred to a Consultant or other designated clinician for action.

No request should be processed without a named Clinician

## Reports for External Locations

Reports for locations outside the hospital will be posted on the day of reporting if results are available before 15:00hrs Monday to Friday.

## Telephoned Reports

* In general results are telephoned when:
* There is a comment on the request form requesting results to be telephoned.
* The results fall within established alert or critical intervals, as defined by procedure.
* The result deviates significantly from previous results.
* Urgent action by clinical staff is required.
* It is necessary to notify the requester that testing will be delayed, where it may compromise patient care.
* All telephoned results must be recorded in the laboratory information system. Details recorded must include date and time of phoned report, staff member notified, and results conveyed. Also any difficulties in notifying staff of results by telephone should be recorded.
* All telephoned reports shall be followed by a final report
* While Departments have internal criteria stipulating which reports should ideally be phoned to clinical staff, it remains the responsibility of the clinician who ordered the test to follow up and act upon its result.
* It is the policy of the Anatomic Pathology department not to give results over the telephone. A preliminary report may be phoned to a clinician by the department’s medical staff.
* It is the policy of the Blood Transfusion department not to give Blood group results over the telephone. Urgent Anti-D quantitation results are phoned to Foetal Assessment when a telephoned result is received from the IBTS. This is recorded in Winpath.

It is not usually necessary to phone abnormal results when:

* Result is consistent with previous results on the patient
* Result is not unexpected

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

## Faxed Reports

Results should not be faxed from the lab. Faxing of results should be limited, and requests for same should be routed through a consultant pathologist or the Chief/Senior medical scientist.

However, as per hospital policy, PP-OG-GEN-19,

**In certain circumstances it may be acceptable to transmit confidential personal data and sensitive personal data by fax as follows:-**

* **Medical Emergency**: - where a delay would cause harm to a patient / client or employee or the potential risk to a patient / client or employee is greater harm than the risk of disclosure of their personal information.

In the case where a referring / transfer hospital needs a result where time would not allow for it to be posted it is acceptable for it to be faxed.

Blood group results would fall under this category.

## Urgent Reports

Requests marked urgent or priority are processed as a priority according to the protocol in each department. Laboratory must be contacted by phone when sending urgent sample. Where appropriate such results are brought to the immediate attention of the requesting clinician or staff in the clinical area.

## Supplemental Reports

Where additional information regarding a request comes to light which necessitates an additional report a supplemental report is issued.

## Amended Reports

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

The original report and the correct report are retained on WINPATH.

The original copy in the patient’s chart is marked as incorrect and the new amended report clearly outlines that it is a deviation from the original.

For MN-CMS results, the amended report will have ‘c’ beside any results which have been corrected. The clinician should be aware when accessing patient results to interpret any corrected results with caution. Where a report has been amended the clinical area will be notified directly. The revised report shows the time and date of the change and the name of the person responsible for amendment.

[MP-GEN-RECALL]

## Copy Reports

There is a facility in every department to print copy reports to additional clinicians / locations as requested. Such request may occur at sample login or additional reports may be requested post authorisation and release of primary report. All additional reports issued after the primary report are marked ‘Copy’. Copy reports are not issued in MN-CMS.

## Delayed Results

In the event where a delay in examination results could compromise patient care each individual department will communicate this to the clinical area. This should be done by telephoning the clinical area and recording the call in the telephone log of the patient concerned.

Where the issue affects a number of clinical areas/ patients a non-conformance should be raised in Q-Pulse. The call should be recorded as part of the immediate action.

## Uncertainty of Measurement

The measurement uncertainty components are those associated with the actual measurement process, starting with presentation of the sample to the measurement procedure and ending with the output of the measured value or test results.

Sources that contribute to uncertainty may include sampling, specimen preparation, portion selection, calibrators, reference materials, input quantities, equipment, environment, specimen condition and operator skill. The laboratory must define the performance requirements for the measurement uncertainty of each measurement procedure. This is a key step in deciding whether a test is fit for purpose.

All laboratory investigations are subject to uncertainty of measurement. Please take this into consideration when interpreting results. Each department has a document listing the uncertainties calculated for its tests. For further information on performance specifications or indicators of uncertainty of measurement for internal test please contact the individual laboratory if required.

## Reference Ranges

Results are compared with Biological Reference Interval where appropriate. These ranges should be matched for age, sex, ethnicity and pregnancy where appropriate and possible. Reference ranges and alert ranges for investigation may be published for use by laboratory and clinical staff. Where results fall within accepted reference ranges and such a result is consistent with the clinical details provided it may be authorised. In any situation where the quoted range may not apply a comment to this effect is included on the report. When reporting of trans-gender patients, a comment will be included that reference ranges applied are female/male as appropriate.

*Please Note: Female reference ranges reported. Please take into account patient’s clinical condition when interpreting results".*

Please contact individual department for further information on reference ranges.

## Accredited and Non-Accredited Test Reporting

The NMH is an INAB accredited testing laboratory (Reg. no. 240MT) - for accredited tests please see: <https://inab.ie/Directory-of-Accredited-Bodies/Laboratory-Accreditation/Medical-Testing/The-National-Maternity-Hospital.html>. Tests that are not accredited by INAB are identified on reports.

1. The following text will be appended in the footer of all hardcopy printed reports for Haematology, Biochemistry and Microbiology, where accredited activities are being reported. ‘An INAB accredited testing laboratory Reg. No 240MT.’
2. The following text will be appended in the footer of all hardcopy printed reports for Blood transfusion, where accredited activities are being reported.

“An INAB accredited testing laboratory Reg. No 240MT. ®Denotes tests performed in a non INAB accredited referral laboratory.”

1. The following note will be added to the body of each Histology hard copy printed report and electronic report.
2. *The NMH is an INAB accredited testing laboratory. Registration number 240MT. This covers testing carried out in this facility. For histology this excludes C9; Adipophilin; GATA-3; Alcian Blue; Grocotts; AlcianBlue/PAS; ZN’ Reticulin; Elastin VG; MS, Van Gieson and PAX8*
3. The following text will be visible on Blood Transfusion, Haematology, Biochemistry and Microbiology electronic reports for where accredited activities are being reported.

“The NMH is an INAB accredited testing laboratory (Reg. no. 240MT) for accredited tests please see: <https://inab.ie/Directory-of-Accredited-Bodies/Laboratory-Accreditation/Medical-Testing/The-National-Maternity-Hospital.html>

1. The following text will be visible on Microbiology electronic reports for where non-accredited activities are being reported -Non-INAB accredited test. For INAB accredited tests (Reg. no 240 MT) please see: <https://inab.ie/Directory-of-Accredited-Bodies/Laboratory-Accreditation/Medical-Testing/The-National-Maternity-Hospital.html>

## Pre-Authorised Results

All results leaving the laboratory have been validated and/or reviewed by a qualified medical scientist or consultant. Pre authorised results contain the electronic signature COMP, they are deemed authorised under the authority of the consultant in charge of the department based on predefined criteria. Such results do not constitute clinical advice.

## Reports on Results from Referral Laboratories

Results from referral laboratories may be received electronically via Medibridge or by hard copy.

* Medibridge results are attributed to the referral laboratory and authorised from Winpath. They are available in MN-CMS and on Winpath Ward Enquiry.
* Hard copy results, where received, from referral laboratories are issued to the requesting clinician.
* Numeric results may be entered into the laboratory information system for ease of access. Where this occurs they are flagged as originating from a referral laboratory. They are available in MN-CMS and on Winpath Ward Enquiry.
* For text based results in the case of the MN-CMS the returned report is scanned and attached to the patient’s record. A message is sent to the requesting clinician.
* The(y)results from referral laboratories when(re) printed on NMH paper are authorised by COMP as outlined in 8.1.3 above.
* The name of the referral laboratory is indicated in the body of the report.

# Post Analytical Storage, Retention and Disposal

Please refer to MP-GEN-CLINCON

## Anatomical Pathology

* Surgical specimens are held for four weeks post reporting.
* Surgical specimens that are all embedded are held for one week post reporting.
* Blocks and slides are retained for 30 years.
* Placental specimens are held for 12 months.
* Post Mortems as per consent.

## Blood Sciences

Blood and urine specimens are usually kept for up to one week at 2 – 6˚ C after processing.

## Microbiology

All CSFs and vitreous / aqueous taps are stored at 4°C for 1 month.

All positive blood culture bottles are stored at 35°C, aerobically until complete (usually 5 days unless prolonged incubation or terminal sub-culture requested by Consultant Microbiologist).

Urine samples are stored at 4°C for minimum of 2 days.

All Sars-CoV-2 and positive Influenzas are stored at 4°C for up to 1 week.

All other specimens are stored at room temperature for 1 week.

## Specimen Reception and Dispatch

Samples are sent to NVRL or other external laboratory and not retained in specimen reception.

All antenatal booking blood specimens are stored frozen for 2 years in NVRL in accordance with NVRL policy.

Primary blood specimens that have been separated and a secondary sample sent for referral are stored in the fridge for up to 2 weeks.

Primary urine specimens that have been separated and a secondary sample sent for referral are stored at room temperature for two days.

All clinical specimens are disposed of according to PP-EF-ENV-17.

# Policy on Protection of Personal Information

The Department of Pathology and Laboratory Medicine follows the hospital policy on data protection.

The scope of this policy is to ensure that the obligations in dealing with personal data, by the organisation comply with the requirements of therelevant Irish legislation, namely the Irish Data Protection Act 2018, and the General Data Protection Regulation GDPR (2018).

The NMH must comply with the Data Protection principles set out in the relevant legislation. This policy applies to all personal data collected, processed and stored by The NMH in relation to its staff, service users and service providers. The NMH makes no distinction between the rights of Data Subjects who are employees and patients: all are treated equally under this policy.

# Complaints procedure

The Department of Pathology and Laboratory Medicine follows the hospital policy on data protection; see PP-OG-QTY-3

All complaints written or verbal will be accepted by the department of Pathology and Laboratory Medicine, and will be handled as follows.

## Monitoring User Complaints

All complaints, verbal or written, are recorded in the CAPA module of Q-Pulse. Complaints are dealt with in the first instance by the Head of Department or depending on the seriousness of the issue by the QMT. Clinical Governance is made aware of written complaints to ensure compliance with hospital policy.

Feedback can be given through the following form:

<https://creator.zohopublic.eu/lukefeeney/feedback-mgmt-2019/form-perma/NMH_Patient_Feedback_Form/usBnGW4MT4FbHX1GE1NVVPX1R22vDTqFvXmMZOxVK9kM9GOhyfZJv5Vg0PuMPbjzwVNGCZEgj4BdNW4edT8p09hFs9Z7OUy6d0YX>

# Anatomical pathology (Histology) Department

## Anatomical Pathology Tests

Figure 14: Anatomical Pathology Tests

|  |  |  |
| --- | --- | --- |
| **Test/assay name** | **Specimen Type /Requirements** | **Turnaround Time** |
| Perinatal Post Mortem Examination | Foetus/Infant body | 8 Weeks |
| Tissue Processing and staining | Fresh and fixed tissue | N/A |
| Frozen Sections | Fresh tissue | N/A |
| Placentae | Fresh tissue for gross examination.  Fixed tissue for high risk patients and placentae sampled in the delivery unit | 8 Weeks |
| Non Gynae Cytology | Fixed specimen | 6 Days |

## Anatomical Pathology Specimen Requirement

Figure 15: Anatomical Pathology Specimen Requirements

| **Specimen type and/or Source** | **Container** | **Procedure** | **Accreditation Status** | **Turnaround Time** |
| --- | --- | --- | --- | --- |
| **Embryo or Foetus** | Container appropriate to size (no fixative) | **Transfer to Mortuary Fridge** | Not Accredited | N/A |
| **Theatre**  **Major Specimens**  e.g. Uterus, Ovarian cysts, etc. | 1 or 2 litre white | **Immerse in Formalin**  (sufficient to cover specimen)  Transfer to Anatomical Pathology. | Accredited | 8 Days |
| **Molar Tissue**  POC’s from cases of recurrent (i.e. 3rd or subsequent miscarriage) | 1litre white | **9.30am-5pm** Transfer **FRESH** to Anatomical Pathology as soon as possible  **Other times store in fridge and transfer to Anatomical Pathology as soon as possible.**  **Please note samples stored in Formalin are not suitable for Cytogenetic Testing.** | Accredited | 8 Days  (Cytogenetic Testing 4-6 Weeks) |
| **Minor Specimens**  e.g. POC’s, Curettings,Fallopian tubes, polyps etc. | 90ml  or  1 or 2 litre white | Immerse in formalin and transfer to Histology. | Accredited | 5 Days |
| **Placentae**  **(For examination in laboratory)** | Black plastic bag inside large Biohazard bag | Transfer **FRESH** to Histology.  If delayed store @ 2-40 C.  (For the purposes of labelling the black plastic bag is the container) | Accredited | 8 Weeks |
| **Placentae**  **(High risk)** | 2 litre white | Immerse in Formalin and attach red sticker to both form and container before transfer to Histology. | Accredited | 8 Weeks |
| **Placentae**  **(Delivery Ward)** | Black plastic bag inside large  Biohazard bag. | Store @ 2-40 C. and transfer to pathology if required otherwise dispose after 7 days. | Accredited | 8 Weeks |
| **Foetal Assessment**  **Products of Conception.** | 90-500ml container. | Immerse in Formalin and transfer to Anatomical Pathology  (Not generally referred for cytogenetics testing) | Accredited | 5 Days |
| **Gynae Clinic/ Rooms**  **Lletz, Cervical and other Biopsies**  **Pipelle** | 40 ml prefilled Formalin container  Place **Pipelle in Tissue Tek yellow mesh** biopsy cassette | Transfer to Histology  Immerse in Formalin in a 40ml prefilled container and transfer to Histology | Accredited | Cervical and other Biopsies 5 days  Lletz 5-7 days |
| **IF THE SPECIMEN IS NOT LISTED HERE PLEASE CONTACT ANATOMICAL PATHOLOGY ON 3180 FOR INFORMATION** | | | | |
| * **N.B PLEASE DO NOT USE THE POD TO DELIVER SPECIMENS TO HISTOLOGY** * **All samples must be in adequate amounts of Formalin. Exceptions to this are, suspected cases of molar pregnancy and POC’s of recurrent (i.e. 3rd or subsequent) miscarriage which are sent up dry up until 17.00hrs Monday to Friday. All specimens after this time must be placed in fixative.** | | | | |
| **Turnaround time is calculated on the basis of NMH data for 2012-2013,where applicable and is the number of working days by which 90% of specimens are reported.** | | | | |

# 

# Biochemistry Department

## Tests andSpecimen Requirements

See Figure 13 for routine cut off times. Urgent specimens are accepted at any time. Specimens from adults are drawn into specific Greiner Vacutainers with appropriate additives as outlined below. Specimens from neonates are drawn into specific Sarstedt microtubes with appropriate additives as outlined below.

## Stability of Routine Biochemistry Tests

Routine biochemistry samples may be analysed up to 8 hours after sample draw.

Figure 16: Routine Biochemistry Tests

| **Test/Profile** | **Adult: Cap**  **Additive (Vol)** | **Paediatric: Cap**  **Additive (Vol)** | **Turnaround  Times** | **Special Requirements** | **Accreditation Status** |
| --- | --- | --- | --- | --- | --- |
| Albumin | Heparin 4ml | Heparin 1.3ml | Same Day |  | Accredited |
| Alkaline phosphatase | Heparin 4ml | Heparin 1.3ml | Same Day |  | Accredited |
| ALT | Heparin 4ml | Heparin 1.3ml | Same Day | Patients treated with Sulfasalazine may generate a false low result for ALT. | Accredited |
| Amylase | Heparin 4ml | Heparin 1.3ml | Same Day |  | Accredited |
| AST | Heparin 4ml | Heparin 1.3ml | Same Day |  | Accredited |
| Bilirubin - Direct | Heparin 4ml | Heparin 1.3ml | Same Day |  | Accredited |
| Bilirubin -Total | Heparin 4ml | Heparin 1.3ml | Same Day |  | Accredited |
| Calcium | Heparin 4ml | Heparin 1.3ml | Same Day |  | Accredited |
| Chloride | Heparin 4ml | Heparin 1.3ml | Same Day |  | Accredited |
| CK | Heparin 4ml | Heparin 1.3ml | Same Day |  | Accredited |
| Creatinine | Heparin 4ml | Heparin 1.3ml | Same Day |  | Accredited |
| CRP | Heparin 4ml | Heparin 1.3ml | Same Day |  | Accredited |
| Total Bile Acids | Heparin 4ml |  | Same Day |  | Accredited |
| Gentamicin-Trough | EDTA 3ml | EDTA 1.3ml | 24 hrs |  | Accredited |
| Gentamicin-Peak | EDTA 3ml | EDTA 1.3ml | 24 hrs |  | Accredited |
| Glucose | Fluoride 2ml | Fluoride 1.3ml | Same Day | See Figure 18 for information | Accredited |
| LDH | Heparin 4ml | Heparin 1.3ml | Same Day |  | Accredited |
| Magnesium | Heparin 4ml | Heparin 1.3ml | Same Day |  | Accredited |
| Osmolality (Plasma) | Heparin 4ml | Heparin 1.3ml | Same Day |  | Accredited |
| Phosphate | Heparin 4ml | Heparin 1.3ml | Same Day |  | Accredited |
| Potassium | Heparin 4ml | Heparin 1.3ml | Same Day |  | Accredited |
| Sodium | Heparin 4ml | Heparin 1.3ml | Same Day |  | Accredited |
| Total Protein | Heparin 4ml | Heparin 1.3ml | Same Day |  | Accredited |
| Triglyceride | Heparin 4ml | Heparin 1.3ml | Same Day | Fasting  Venipuncture immediately after or during the administration of  Metamizole (Dipyrone) may lead to falsely low results for Triglyceride. Venipuncture should be performed prior to the administration of Metamizole. | Accredited |
| Uric Acid | Heparin 4ml | Heparin 1.3ml | Same Day | NAC interference may lead to falsely low results.  Venipuncture immediately after or during the administration of  Metamizole (Dipyrone) may lead to falsely low results for Uric Acid. Venipuncture should be performed prior to the administration of Metamizole. | Accredited |
| Anti Mullerian Hormone | Plain 7ml |  | 3 Days | Mon – Fri  Biotin may cause some concentration dependent negative interference in this assay if high dose supplements are taken. If this is suspected, a repeat request 8 plus hours off Biotin is recommended in the first instance. | Accredited |
| CA 125 | Plain 7ml |  | 3 Days | Mon – Fri  Biotin may cause some concentration dependent negative interference in this assay if high dose supplements are taken. If this is suspected, a repeat request 8 plus hours off Biotin is recommended in the first instance. | Accredited |
| Free bHCG and PAPP-A | Plain 7ml |  | 3 Days | Clinical details must include gestation. Samples are only suitable for analysis between 10 weeks 0 days and 13 weeks 6 days. | Accredited |
| sFlt-1/PlGF ratio | Plain 7ml |  | 3 Days | Sample to be taken > 20 weeks. Note: The current NICE Guideline (DG23) only recommends the use of the ratio as a rule out (short term) for PE | Accredited |
| HCG | Heparin 4ml |  | 48 hrs | Mon – Fri except by special request.  Sat a.m. only if sample received in lab before 11.30a.m.  Biotin may cause some concentration dependent negative interference in this assay if high dose supplements are taken. If this is suspected, a repeat request 8 plus hours off Biotin is recommended in the first instance. | Accredited |
| Oestradiol | Plain 7ml |  | 48 hrs | Mon – Fri except by special request.  The Oestradiol assay used in the NMH should NOT be used when monitoring Oestradiol levels in patients being treated with fulvestrant.  Biotin may cause some concentration dependent positive interference in this assay if high dose supplements are taken. If this is suspected, a repeat request 8 plus hours off Biotin is recommended in the first instance. | Accredited |
| Free T4 (FT4) | Plain 7 ml | Heparin 1.3ml | 3 Days | Mon – Fri  Biotin may cause some concentration dependent positive interference in this assay if high dose supplements are taken. If this is suspected, a repeat request 8 plus hours off Biotin is recommended in the first instance | Accredited |
| TSH | Plain 7 ml | Heparin 1.3ml | 3 Days | Mon – Fri  Biotin may cause some concentration dependent negative interference in this assay if high dose supplements are taken. If this is suspected, a repeat request 8 plus hours off Biotin is recommended in the first instance. | Accredited |
| Ferritin | Plain 7 ml |  | 3 Days | Mon – Fri  Biotin may cause some concentration dependent negative interference in this assay if high dose supplements are taken. If this is suspected, a repeat request 8 plus hours off Biotin is recommended in the first instance. | Accredited |

Figure 17 : Routine Biochemistry Profiles

| **Profile** | **Adult: Cap**  **Additive (Vol)** | **Paediatric: Cap**  **Additive (Vol)** | **Tests included** |
| --- | --- | --- | --- |
| **UE** | Heparin 4ml | Heparin 1.3ml | Sodium, Potassium, Chloride, Urea, Creatinine |
| **PN** | Heparin 4ml | Heparin 1.3ml | UE, Calcium, Magnesium, Phosphate, Triglyceride, Albumin, Corrected Calcium |
| **SBR** | Heparin 4ml | Heparin 1.3ml | Bilirubin Direct, Bilirubin Total |
| **LFT** | Heparin 4ml | Heparin 1.3ml | Total Protein, Albumin, AST, ALT, ALP, SBR |
| **PET** | Heparin 4ml | Heparin 1.3ml | UE, LFT, Urate |
| **REC** | Heparin 4ml | Heparin 1.3ml | UE, Calcium, Magnesium, Phosphate, Urate, Total Protein, Albumin, AST, ALT, ALP, SBR, Corrected Calcium |
| **GBL** | Heparin 4ml | Heparin 1.3ml | Calcium, Magnesium, Phosphate, Albumin, ALP, Corrected Calcium, Sodium, Potassium, Chloride, Urea, Creatinine |
| **CAL** | Heparin 4ml | Heparin 1.3ml | Calcium, Albumin, Corrected Calcium |
| **U8** | Heparin 4ml | Heparin 1.3ml | UE, Calcium, Magnesium, Phosphate, Albumin, Corrected Calcium |
| **U81** | Heparin 4ml | Heparin 1.3ml | UE, Calcium, Magnesium, Phosphate, Albumin, Corrected Calcium, SBR |
| **CSFB** | Fluoride | Fluoride | CSF Glucose and Protein |

Figure 18: Glucose Testing

All adult samples should be drawn into grey topped fluoride oxalate tubes

| **Glucose Test/Profile** | **Special Requirements** | **Accreditation Status** |
| --- | --- | --- |
| Fasting | Fasting 12 hours. | Accredited |
| Random | No dietary restriction. | Accredited |
| Post Prandial | 2 hours following a meal. | Accredited |
| Antenatal Oral Glucose Tolerance Test  (4 Specimens) | Duration: 3 hours. **1**.Fasting glucose (Fasting 12 hours)  Then glucose administration,  **2**. Specimen taken 1 hour post glucose administration, **3**.Specimen taken 2 hours post glucose administration,**4**.Specimen taken 3 hours post glucose administration. | Accredited |
| Postnatal Oral Glucose Tolerance Test  (2 Specimens) | **1**.Fasting glucose (Fasting 12 hours)  Then glucose administration,  **2**. Specimen taken 2 hours post glucose administration. | Accredited |
| Gestational Diabetes Screen  (2 specimens) | **1**.Fasting glucose(Fasting 12 hours) **2**. Specimen taken 1 hour post glucose administration. | Accredited |
| Blood glucose series  (5 specimens) | Times entered as per specimen/request form. | Accredited |
| Glucose Challenge Test  (1 specimen) | 1 hour post glucose administration. | Accredited |

Figure 19: Urine Biochemistry Tests

| **Urine Test/ Profile** | **Container** | **Additive** | **Turnaround Times** | **Special Requirements** | **Accreditation Status** |
| --- | --- | --- | --- | --- | --- |
| Creatinine | Spot Universal or  24 hr Urine | None | Same Day | \*If for Creatinine Clearance, the Plasma for Creatinine determination must be taken during the 24hr period of urine collection | Accredited |
| Protein | Spot Universal or  24 hr Urine | None | Same Day |  | Accredited |
| Protein: Creatinine  Ratio | Spot Universal | None | Same Day |  | Accredited |
| Osmolality (Urine) | Spot Universal | None | Same Day |  | Accredited |
| Potassium | Spot Universal or  24 hr Urine | None | Same Day |  | Accredited |
| Sodium | Spot Universal or  24 hr Urine | None | Same Day |  | Accredited |
| Chloride | Spot Universal or  24 hr Urine | None | Same Day |  | Accredited |
| Calcium | Spot Universal or  24 hr Urine | None | Same Day |  | Accredited |
| Phosphate | Spot Universal or  24 hr Urine | None | Same Day |  | Accredited |

Figure 20: CSF Biochemistry Tests

| **CSF Test/Profile** | **Container** | **Turnaround  Times** | **Special Requirements** | **Accreditation Status** |
| --- | --- | --- | --- | --- |
| CSF Glucose | Fluoride | Same Day |  | Accredited |
| CSF Protein | Fluoride | Same Day |  | Accredited |

## Specialised Biochemical Investigations

These investigations are referred to external centres. Turnaround times, where quoted, reflect specialist nature and referral laboratory response time. For further information contact specimen reception Ext: 3178 for sample requirements and biochemistry Ext:3546 for result enquires.

Figure 21: Specialised Biochemical Investigations

Biotin may cause interference in some of our referral tests. If such interference is suspected, please contact the Biochemistry Laboratory for a list of susceptible tests.

| **Test** | **Code** | **Adult** | **Paed** | **TAT** | **Special Requirements** | **Referral Centre** |
| --- | --- | --- | --- | --- | --- | --- |
| **7-Dehydro-cholesterol** | **7DEH** | Heparin 4ml | Heparin 1.3ml | 3 weeks | Protect from light at all times. Separate into 2° tube.Diagnosis of Smith-Lemli-Opitz syndrome | Camilla Scott , Chemical Pathology, Sheffield Children's Hospital [**(7)**](#_References:), Western Bank, Sheffield S10 2TH, UK  Tel: 00441142717305 (or 6306) |
| **11- Deoxycortisol** | **11DE** | Plain 7ml |  |  | Store at 2-8°C. In neonates the sample should be taken at least 48 hours post birth. | Reference Chemistry Laboratory at St Thomas' [(10)](http://www.viapath.co.uk/test-alphabetical?location=113&department=130&laboratory=146&letter=) Tel: +44 207 188 1264  4th floor, North Wing, St Thomas' Hospital, Westminster Bridge Road  London SE1 7EH |
| **17 OH Progesterone (Paed)** | **OHPP**\* |  | Serum or Heparin accepted | 14 days | Ensure neonates are at least 48hrs old as baby will have mothers OHPP present and a false result will be obtained. Assay is run every 2nd Wednesday at 10.30am. Early morning specimens. Separate sample and store in fridge. **If sample received over weekend separate and freeze.** | Biochemistry Dept, Children’s Health Ireland at Crumlin[(1)](http://olchlab.return2sender.ie/Default.aspx) Tel : 01 4096427 |
| **17 OH Progesterone (Adult)** | **OHP**\* | Plain 7ml |  | 5 days | Spin to separate from cells. Stable on gel. Separate sample and store in fridge if not sent on the same day. **If sample received over weekend separate and freeze.** | Biochemistry Dept, St James Hospital [(3)](http://search.stjames.ie/Labmed/)  Tel: 01 4162918 |
| **Angiotensin Converting Enzyme (ACE)** | **ACE**\* | Plain 7ml |  |  | Spin to separate from cells. Stable on gel. | Biochemistry Dept, St James Hospital [(3)](http://search.stjames.ie/Labmed/)  Tel: 01 4162918 |
| **Acetylcholine Receptor Antibodies / MuSK antibodies** | **ACRA** | Plain 7ml | **Plain 2ml** | 3 days | Spin and separate sample and fridge within4 – 8hrs of blood draw. | Protein Reference Unit[(5)](https://www.immqas.org.uk/pru.asp?ID=316)  Sheffield Northern General Hospital  +44 114 2715552 |
| **ACTH** | **ACTH**\* | EDTA 3ml | EDTA 1.3ml |  | Separate immediately and freeze. | Biochemistry Dept, The Mater Hospital,  Tel: 01 8032383 |
| **AcylCarnitine (Total, Free + Acyl)** | **CARN**\* |  | Heparin 1.3ml | 3 weeks | Separate sample and fridge. Stable in the fridge over the weekend. | Camilla Scott, Chemical Pathology, Sheffield Children's Hospital[(7)](#_References:), Western Bank, Sheffield S10 2TH, England  Tel; 00441142717305 (or 7306) |
| **AcylCarnitine (Free + Interpretive comment)** | **ACAT**\* |  | Guthrie Card |  | Air dry for 2 hrs, avoid heat and humidity. Acylcarnitines profiling is always accompanied by urine for organic acids. | Biochemistry Dept Children’s Health Ireland at Temple St.[(4)](#_References:)  Tel : 01 8784272 |
| **Alcohol** | **ALC** | Fluoride Oxalate |  | 5 days | Preferably Fluoride oxalate sample but serum acceptable. Send primary specimen. No need to separate adult samples. | Biochemistry Dept, Beaumont Hospital [(9)](#_References:) Tel: 01 8092668 |
| **Aldolase** | **ALDO** | Plain 7ml | **Plain 2ml** |  | Spin to separate from cells. Stable on gel. | Medlab Pathology [(2)](http://www.sonichealthcare.ie/test-information/tests-a-z/tests-a.aspx) Tel: 01 293 3690 |
| **Aldosterone** | **ALD**\* | Plain 7ml  Or  EDTA | **Plain 2m** | 1 week | Spin to separate from cells. Separate and freeze within 4 hours. Indicate patient’s posture | Eurofins Biomnis [(11)](https://www.eurofins-biomnis.com/en/services/test-guide/) Tel: 01 2958545 |
| **Alkaline Phosphatase Isoenzymes** | **ALPI** | Plain 7ml | **Plain 2ml** |  | Spin to separate from cells. Stable on gel. | Biochemistry Dept, The Mater Hospital,  Tel: 01 8032383 |
| **Alpha 1 Anti-Trypsin** | **AATV**\* | Plain 7ml | **Plain 2ml** |  | Separate sample and fridge. | Biochemistry Dept, Beaumont Hospital [(9)](#_References:)Tel: 01 8092668 |
| **Alpha 1 Anti-Trypsin PI phenotype** | **AAP**\* | Plain 7ml | **Plain 2ml** | 2 weeks | Serum phenotyping. | Alpha-1 Foundation Ireland, RCSI Smurfit Building, Beaumont Hospital, Dublin 9. 01-8093871 |
| **Alpha-fetoprotein**  **(as tumour marker)** | **AFP**\* | Plain 7ml |  | 2 weeks | Adult: Stable on gel after spinning. | Biochemistry St. Vincent's. [(6)](#_References:)  Tel: 01 2214550 |
| **Alpha-fetoprotein**  **(for neural tube defect)** | **AFPP**\* |  | Plain 2ml or Heparin 1.3ml | 2 weeks | Paed: Separate + fridge | Biochemistry Dept, Children’s Health Ireland at Crumlin[(1)](http://olchlab.return2sender.ie/Default.aspx) Tel : 01 4096427 |
| **Amikacin** | **AMKI** | Plain 7ml |  |  | Samples must be analysed within 24 hours of collection. Patients on once-daily regimens should have specimens taken 12-24 after the dose is given. Single Daily Dose Regimen: Pre-Dose Level: <5.0 mgs/L. Separate sample and fridge. | Biochemistry St. Vincent's. [(6)](#_References:)  Tel: 01 2214550 |
| **Amino Acids - Urine** | **AMAU**\* | Urine | Urine | 10 days | 5 ml random urine required transfer urine from MSU to 10 ml tube and freeze ASAP | Biochemistry Dept, Children’s Health Ireland at Temple St. [(4)](#_References:)  Tel : 01 8784272 |
| **Amino Acids- Blood** | **AMA**\* |  | Heparin 1.3ml | 5 days | Separate immediately blood/CSF and store in fridge. Please note if CSF sample is haemolysed. | Biochemistry Dept, Children’s Health Ireland at Temple St.[(4)](#_References:)  Tel : 01 8784272 |
| **Amino Acids- CSF** | **ACF**\* |  | Plain tube or fluoride oxalate) | 5 days | CSF should be paired with plasma to calculate ratios. | Biochemistry Dept, Children’s Health Ireland at Temple St.[(4)](#_References:)  Tel : 01 8784272 |
| **Amiodarone**  **(Cordarone)** | **AMIO** | Plain 7ml Or EDTA |  |  | Separate and freeze within 4 hours. | Eurofins Biomnis [(11)](https://www.eurofins-biomnis.com/en/services/test-guide/) Tel: 01 2958545 |
| **Ammonia** | **AMM**\* | Heparin 4ml | Heparin 1.3ml | 2 days | Separate and freeze immediately. Avoid haemolysis | Biochemistry Dept, Children’s Health Ireland at Temple St. [(4)](#_References:)  Tel : 01 8784272 |
| **Androstenedione (Paed)** | **ANDP**\* |  | **Plain 2ml** |  | Spin to separate from cells. Stable on gel. Separate + fridge if not sent on the same day. | Endocrinology Dept. St James Hospital[(3)](http://search.stjames.ie/Labmed/) Tel : 01 416 2991 |
| **Androstenedione (Adult)** | **AND**\* | Plain 7ml |  |  | Spin to separate from cells. Stable on gel. Separate + fridge if not sent on the same day. | Endocrinology Dept, St. Vincent's.[(6)](#_References:)  Tel : 01 2213107 |
| **Anti-Ovarian Antibodies** | **AOA** | Plain 7ml |  | 3 days | (Anti-Adrenal Antibodies) Spin to separate from cells. Stable on gel. Separate + fridge if not sent on the same d  ay. | Protein Reference Unit [(5)](https://www.immqas.org.uk/pru.asp?ID=316)  Sheffield Northern General Hospital  +44 114 2715552 |
| **Anti-parietal cells antibody** | **PCA** | Plain 7ml |  | 10 days | Spin to separate from cells. | Immunology Lab, St. Vincent's.[(6)](#_References:)  Tel: 01 2214550 |
| **β-Hydroxybutyrate** | **BHBY**\* |  | Fluoride 1.2ml |  | See RF-CS-BIO-41 Hypoglycaemia Workup Request Form - Separate and freeze | Biochemistry Dept, Children’s Health Ireland at Temple St[(4)](#_References:)  Tel : 01 8784272 |
| **Bile Acids (Paed)** | **BILP** | N/A | Heparin 1.3ml |  | Spin to separate from cells and store in fridge. For the diagnosis of bile acid synthesis disorders. | Camilla Scott, Metabolic Section,  Clinical Chemistry, Sheffield Children's Hospital [(7)](#_References:), Western Bank,  Sheffield S10 2 TH, England  Tel: +441142717305 |
| **Biotinidase Activity** | **BIOT**\* |  | Heparin 1.3ml | 4 weeks | Separate and freeze | Chemical Pathology, Sheffield Children's Hospital [(7)](#_References:), Western Bank,  Sheffield S10 2 TH, England  Tel: +441142717305 (or 7306) |
| **Brain natriuretic peptide (BNP)** |  |  |  |  | See NT-BNP |  |
| **C1 Esterase (Function & Total)** | **C1E** | 2 Sodium Citrate samples |  |  | Separate and freeze sample within 4 – 6 hours | Medlab Pathology [(2)](http://www.sonichealthcare.ie/test-information/tests-a-z/tests-a.aspx) Tel: 01 293 3690 |
| **C1 Esterase Inhibitor** | **C1ES** | Plain 7ml | **Plain 2ml** | 6 days | Spin to separate from cells. Stable on gel. Separate + fridge if not sent on the same day. | Medlab Pathology [(2)](http://www.sonichealthcare.ie/test-information/tests-a-z/tests-a.aspx) Tel: 01 293 3690 |
| **CA 15.3** | **C153**\* | Plain 7ml | **Plain 2ml** |  | Spin to separate from cells. Stable on gel. | Biochemistry St Vincent’s Hospital [(6)](#_References:)  Tel : 01 2214550 |
| **CA 19.9** | **C199**\* | Plain 7ml | **Plain 2ml** |  | Spin to separate from cells. Stable on gel | Biochemistry St Vincent’s Hospital [(6)](#_References:)  Tel : 01 2214550 |
| **Caeruloplasmin** | **CER**\* | Plain 7ml |  | 5 days | Spin to separate from cells. Stable on gel. Separate + fridge if not sent on the same day. | Biochemistry Dept, St James Hospital [(3)](http://search.stjames.ie/Labmed/)  Tel : 01 4162918 |
| **Caeruloplasmin (Paed)** | **CERP** |  | **Plain 2ml** |  | Transport at ambient temperature via courier | Protein Reference Unit [(5)](https://www.immqas.org.uk/pru.asp?ID=316)  Sheffield Northern General Hospital  +44 114 2715552 |
| **Calcitonin** | **CALN**\* | Plain 7ml | **Plain 2ml** |  | Separate and freeze within 10 mins | Biochemistry Dept, The Mater Hospital, Tel: 01 8032383 |
| **Calcium Creatinine Ratio** | **CCR** |  | Spot Urine |  |  | Biochemistry Dept, Children’s Health Ireland at Temple St.[(4)](#_References:)  Tel : 01 8784272 |
| **Carbamazepine (Tegretol)** | **CARB**\* | Plain 7ml | Heparin 1.3ml | 5 days | Spin to separate from cells. Stable on gel. | Biochemistry Dept, Beaumont Hospital [(9)](#_References:)Tel: 01 8092668 |
| **Carcinoembryonic antigen (CEA)** | **CEA**\* | Plain 7ml |  | 7 days | Spin to separate from cells. Stable on gel. Most useful in colorectal cancer | Biochemistry St. Vincent's Hospital [(6)](#_References:)  Tel: 01 2214550 |
| **Carnitine (Total, Free & Acyl)** | **CARN**\* |  | Heparin 1.3ml | 3 weeks | Separate + fridge. Stable in the fridge over the weekend | Chemical Pathology, Sheffield Children's Hospital [(7)](#_References:), Western Bank,  Sheffield S102TH, Tel: +44 1142717305 (or 7306) |
| **Catecholamines (Adult)** | **CAT**\* | 24 hr Urine (50% HCL) |  |  | See WI-CS-BIO-17 | HPLC Dept, Beaumont Hospital [(9)](#_References:)  Tel : 01 8092351 |
| **Catecholamines (Paed)** | **CATP**\* |  | 5-10 ml Urine |  | See WI-CS-BIO-17 | HPLC Dept, Beaumont Hospital. [(9)](#_References:)  Tel : 01 8092351 |
| **Cholesterol** | **LIP**\* | Plain 7ml |  | 5 days | Fasting sample is preferable. Serum or heparin accepted. Serum sample stable after spinning on gel. If a Lithium heparin sample is received please separate sample into a 2° tube | Biochemistry Dept, The Mater Hospital,  Tel: 01 8032383 |
| **Cholinesterase/ Pseudocholinesterase** | **CHOI**\* | Plain 7ml | **Plain 2ml** |  | Separate + fridge if not sent on the same day. (In preoperative screening, cholinesterase is used to detect patients with atypical forms of the enzyme and hence avoid prolonged apne caused by slow elimination of muscle relaxants.) | Biochemistry Dept, St James Hospital [(3)](http://search.stjames.ie/Labmed/)  Tel : 01 4162918 |
| **Clobazam (Frisium)** | **CLOB** | Plain 7ml |  | 1 week | Spin and separate from cells. | Medlab Pathology [(2)](http://www.sonichealthcare.ie/test-information/tests-a-z/tests-a.aspx) Tel: 01 293 3690 |
| **Coeliac Screen (Tissue Transglutaminase Ab/Endomysial Abs )** | **COES** | Plain 7ml |  | 1 week | **Referred out by Haematology laboratory.**  Note: Only samples that are positive for Tissue Transglutaminase (tTG) IgA will have an Endomysial Antibody (IgA) test performed. | Immunology Dept, St James Hospital [(3)](http://search.stjames.ie/Labmed/)  Tel : 01 4162924 |
| **Clonazepam (Rivotril)** | **CLON**\* | Plain 7ml | **Plain 2ml** | 7 days | Spin and separate from cells. | Medlab Pathology [(2)](http://www.sonichealthcare.ie/test-information/tests-a-z/tests-a.aspx) Tel: 01 293 3690 |
| **Copper** | **COP**\* | Serum/  Urine | Serum/  Urine |  | **Blood:** Trace metal tube required from Tallaght Hospital  **Urine :** 24 hour collection in acid washed containers received from Tallaght Hospital | Biochemistry Dept, AMNCH Tallaght Hospital [(8)](#_References:). Tel : 01 4143951 |
| **Cortisol (Paed)** | **CORP**\* |  | **Plain 2ml** |  |  | Biochemistry Dept, Children’s Health Ireland at Temple St.[(4)](#_References:)  Tel : 01 8784272 |
| **Cortisol (Adult)** | **COR**\* | Plain 7ml |  | 7 days | Note time of sample. Spin to separate from cells. Stable on gel. | Biochemistry Dept, The Mater Hospital, Tel: 01 8032383 |
| **C-Peptide (Paed)** | **PCP**\* |  | **Plain 2ml** |  | Separate and freeze ASAP. | Biochemistry Dept, Children’s Health Ireland at Temple St.[(4)](#_References:)  Tel : 01 8784272 |
| **C-Peptide (Adult)** | **CPEP**\* | Plain 7ml |  |  | Separate immediately and freeze. | Endocrinology Dept, St James Hospital [(3)](http://search.stjames.ie/Labmed/) Tel : 01 416 2991 |
| **Cystine** | **CYS**\* | Heparin 4ml | Heparin 1.3ml | 8 weeks | Do not separate. Contact Temple St for sample details. | Metabolic Laboratory, Children’s Health Ireland at Temple St. [(4)](#_References:)  Tel : 01 8784272 |
| **Diazepam (Valium)** | **DIAZ**\* | Plain 7ml |  |  | Stable after spinning on gel. | Medlab Pathology [(2)](http://www.sonichealthcare.ie/test-information/tests-a-z/tests-a.aspx) Tel: 01 293 3690 |
| **DHEA** | **DHEA**\* | Plain 7ml | **Plain 2ml** |  | Spin to separate from cells. Stable on gel. Separate if not sent within the day. | Endocrinology Dept, St. Vincent's Hospital [(6)](#_References:)Tel : 01 2214406 |
| **Dihydrotestosterone** | **DHTE** | Plain 7ml | **Plain 2ml** |  | In pre-pubertal patients values should be assessed before and after treatment with hCG. | Leeds SAS Steroid Centre [(16)](http://www.sas-centre.org/assays/hormones/5a-dihydrotestosterone), St James's University Hospital, Leeds |
| **Digoxin** | **DIG**\* | Plain 7ml |  | 4 days | Samples must be taken pre-dose or at least 6 hours post-dose. State dose. Spin to separate from cells. Stable on gel. | Biochemistry Dept, Beaumont Hospital [(9)](#_References:)Tel: 01 8092668 |
| **Electrophoresis** | **SPE** | Plain 7ml |  | 1 week |  | Biochemistry Dept, St. Vincent's Hospital [(6)](#_References:) Tel: 01 2214550 |
| **Epanutin (Phenytoin)** | **PHN**\* | Plain 7ml | **Plain 2ml** |  | Stable after spinning on gel. | Biochemistry Dept, Beaumont Hospital [(9)](#_References:)Tel: 01 8092668 |
| **Ethosuximide (Zarontin)** | **EXE** | Plain 7ml |  |  | Spin and separate from cells. | Medlab Pathology [(2)](http://www.sonichealthcare.ie/test-information/tests-a-z/tests-a.aspx) Tel: 01 293 3690 |
| **Flecainide** | **FLE**\* | EDTA 3ml | EDTA 1.3ml |  | Do not spin, send as whole blood | Medlab Pathology [(2)](http://www.sonichealthcare.ie/test-information/tests-a-z/tests-a.aspx) Tel: 01 293 3690 |
| **Frisium (Clobazam)** | **CLOB** | Plain 7ml |  |  | Spin and separate from cells. | Medlab Pathology [(2)](http://www.sonichealthcare.ie/test-information/tests-a-z/tests-a.aspx) Tel: 01 293 3690 |
| **Fructosamine** | **FRUC** | Heparin 4ml |  |  | Spin and separate from cells. | Biochemistry Dept,  The Rotunda Hospital  Tel:018171739 |
| **FSH** | **FSH**\* | Heparin 4ml / Plain 7ml | Plain 2ml / Heparin 1.3ml | 7 days | Spin to separate from cells in gel tubes. Remove from gel after 24 hours. Stable in 2° tubes in fridge for 7 days at 2 - 8°C. | **Adult :** Biochemistry Dept, The Mater Hospital,  **Paed :** Biochemistry Dept, Children’s Health Ireland at Crumlin[(1)](http://olchlab.return2sender.ie/Default.aspx) Tel : 01 4096427 |
| **Glycosaminoglycans (GAG's)** |  | Urine |  |  | See below for Mucopolysaccharides |  |
| **Glutamic Acid Decarboxyalse (GAD) Antibodies** | **GAD** | Plain 7ml |  | 1 week | Spin and separate. | Protein Reference Unit [(5)](https://www.immqas.org.uk/pru.asp?ID=316)  Sheffield Northern General Hospital  +44 114 2715552 |
| **Gamma Gluyamyl Transferase (GGT-Paed)** | **GGTP**\* |  | Heparin 1.3ml |  |  | Biochemistry Dept, Children’s Health Ireland at Crumlin[(1)](http://olchlab.return2sender.ie/Default.aspx) Tel : 01 4096427 |
| **Gamma Gluyamyl Transferase (GGT-Adult)** | **GGT**\* | Heparin 4ml / Plain 7ml |  |  | Serum or heparin accepted. Serum sample stable after spinning on gel. If Lithium heparin sample received separate into a 2° tube | Biochemistry Dept, The Mater Hospital,  Tel: 01 8032383 |
| **Growth Hormone (Paed)** | **GHP**\* |  | **Plain 2ml** | 7 days | Separate and fridge | Biochemistry Dept, Children’s Health Ireland at Temple St.[(4)](#_References:)  Tel : 01 8784272 |
| **Growth Hormone (Adult)** | **GH**\* | Plain 7ml |  | 7 days | Separate and fridge | Biochemistry Dept, The Mater Hospital,  Tel: 01 8032383 |
| **HbA1c** | **HA1C**\* | EDTA 3ml |  | 7 days | Send 1° tube unseparated. Stable over the weekend. | Endocrinology Dept, Vincent's [(6)](#_References:)  Tel : 01 2213107 |
| **Homocysteine (Total)**  **(Paed)** | **HOM**\* | Haematology referral test. | 3 x Heparin 3 ml | 14 days | Separate and freeze within 10 mins | Biochemistry Dept, Children’s Health Ireland at Temple St.[(4)](#_References:)  Tel : 01 8784272 |
| **Hypoglycaemia Workup** |  |  |  |  | Careset orderable in Powerchart also see **RF-CS-BIO-41** |  |
| **IGE** | **IGE** | Plain 7ml | **Plain 2ml** |  | Separate sample and fridge. | Biochemistry Dept, Children’s Health Ireland at Crumlin[(1)](http://olchlab.return2sender.ie/Default.aspx) Tel : 01 4096427 |
| **Immune Reactive Trypsin** | **IRT**\* | Plain 7ml |  | 2 weeks | Separate and freeze sample within 1 hours of blood draw. | Eurofins Biomnis [(11)](https://www.eurofins-biomnis.com/en/services/test-guide/) Tel: 01 2958545 |
| **Immuno-globulins**  **(IgG, IgA, IgM, IgE)** | **IMM**\* | Plain 7ml | **Plain 2ml** | 7 days | Separate sample and fridge. | Biochemistry Dept, OLHFSC Children’s Health Ireland at Crumlin, Tel : 01 4096427 |
|
|
| **IgG subclasses** | **IGGS** | Plain 7ml | **Plain 2ml** |  | Separate sample and fridge. | Protein Reference Unit [(5)](https://www.immqas.org.uk/pru.asp?ID=316)  Sheffield Northern General Hospital  +44 114 2715552 |
| **Inhibin A** | **INA** | Plain 7ml |  | 1 month | Send to referral lab ASAP. Sample must be separated and frozen if not sent on same day | Medlab Pathology (TDL) [(12)](https://tdlpathology.com/test-information/a-z-test-list/i/) Tel: 01 293 3690 |
| **Inhibin B** | **INH**\* | Plain 7ml |  | 4 days | Separate sample and freeze. Sample from Day 3 of cycle required. Send sample Urgently | Medlab Pathology [(2)](http://www.sonichealthcare.ie/test-information/tests-a-z/tests-a.aspx) Tel: 01 293 3690 |
| **Insulin (Paed)** | **INSP**\* |  | **Plain 2ml** |  | Separate and freeze ASAP. | Biochemistry Dept, Children’s Health Ireland at Temple St.[(4)](#_References:)  Tel : 01 8784272 |
| **Insulin (Adult)** | **INSU**\* | Plain 7ml |  | 3 weeks | Separate and freeze ASAP. | Endocrinology Dept, St James Hospital[(3)](http://search.stjames.ie/Labmed/) Tel: 01 416 2991 |
| **Insulin antibodies** | **IA** | Plain 7ml |  | 5 days | Spin to separate from cells. | Protein Reference Unit [(5)](https://www.immqas.org.uk/pru.asp?ID=316)  Sheffield Northern General Hospital  +44 114 2715552 |
| **Insulin Growth Factor / Somatomedin** | **IGF**\* | Plain 7ml | **Plain 2ml** |  | Separate and freeze ASAP. | **Adult**: Biochemistry Dept, The Mater Hospital, Tel: 01 8032383  **Paed:** Biochemistry Dept, Children’s Health Ireland at Crumlin[(1)](http://olchlab.return2sender.ie/Default.aspx) Tel : 01 4096427 |
| **Islet cell antibodies** | **ICA** | Plain 7ml |  | 1 week | Spin to separate from cells. Stable on gel. | Protein Reference Unit [(5)](https://www.immqas.org.uk/pru.asp?ID=316)  Sheffield Northern General Hospital  +44 114 2715552 |
| **Isoelectric Focusing of Transferrin** | **IFTR**\* | Plain 7ml | **Plain 2ml** |  | Separate and store in fridge. **Do not send on a Friday**, leave in fridge to send on Monday. | Dept. of Neuroimmunology, Institute of Neurology, Queen Square House, London WC1N3BG.  Tel: 00442034483814 |
| **Keppra Levels (Leviteracetam)** | **KEPP**\* | Plain 7ml |  | 3 days | Spin to separate from cells. Stable on gel | Medlab Pathology [(2)](http://www.sonichealthcare.ie/test-information/tests-a-z/tests-a.aspx) Tel: 01 293 3690 |
| **Lactate (CSF)** | **CSFL**\* |  | CSF |  | Freeze sample before dispatch. | Biochemistry Dept, Children’s Health Ireland at Temple St.[(4)](#_References:)  Tel : 01 8784272 |
| **Lamotrigine (Lamictal)** | **LAMO**\* | Plain 7ml |  | 5 days | Spin to separate from cells. Stable on gel | Medlab Pathology [(2)](http://www.sonichealthcare.ie/test-information/tests-a-z/tests-a.aspx) Tel: 01 293 3690 |
| **LH** | **LH**\* | Heparin 4ml / Plain 7ml | Plain 2ml / Heparin 1.3ml | 7 days | Spin to separate from cells in gel tubes. Remove from gel after 24 hours. Stable in 2° tubes in fridge for 7 days at 2 - 8°C. | **Adult :** Biochemistry Dept, The Mater Hospital,  **Paed :** Biochemistry Dept, Children’s Health Ireland at Crumlin[(1)](http://olchlab.return2sender.ie/Default.aspx) Tel : 01 4096427 |
| **Lipase** | **LIPE**\* | Plain 7ml | **Plain 2ml** | 1 day |  | Medlab Pathology [(2)](http://www.sonichealthcare.ie/test-information/tests-a-z/tests-a.aspx) Tel: 01 293 3690 |
| **Lipids** | **LIP**\* | Heparin 4ml / Plain 7 ml |  | 5 days | Fasting sample is preferable. Serum or heparin accepted. Serum sample stable after spinning on gel. If a Lithium heparin sample is received please separate sample into a 2° tube | Biochemistry Dept, The Mater Hospital,  Tel: 01 8032383 |
| **Lithium** | **LI**\* | Plain 7ml |  | 5 days | Spin to separate from cells. Stable on gel | Biochemistry Dept, Beaumont Hospital [(9)](#_References:)Tel: 01 8092668 |
| **Lysosomal Enzymes(Lysosomal storage disease/White cell enzymes)** | **WCE**\* |  | EDTA 1.3ml x4 |  | Send primary sample unseparated | Heather Church,  Willink Unit Genetic Medicine [(13)](#_References:), 6th Floor, POD 1, St Mary's Hospital, Oxford Road, Manchester, M13 9WL.  Tel: +441617012137 |
| **Maple Syrup Urine Disease Screen (MSUD)** | **AMA**\* |  | Heparin 0.6ml |  | Separate and fridge.Carried out as part of an amino acid screen to include Branched chain amino acids(Leu, Iso, Val) | Biochemistry Dept, Children’s Health Ireland at Temple St.[(4)](#_References:)  Tel : 01 8784272 |
| **Metabolic Workup** |  |  |  |  | Careset orderable in Powerchart also see **RF-CS-BIO-36** |  |
| **Methionine** | **METH**\* |  | Heparin 0.6ml |  | Separate and freeze | Metabolic lab, Children’s Health Ireland at Temple St. [(4)](#_References:) |
| **Microalbumin** | **MALB** | Urine |  |  | Early morning urine | Biochemistry St. Vincent’s. [(6)](#_References:)  Tel: 01 2214550 |
| **Mucopolysaccharides (MPS) screen** | **MUCO** | Urine |  | 4 weeks | Random urine frozen. 5 ml required | Heather Church,  Willink Unit Genetic Medicine [(13)](#_References:), 6th Floor, POD 1, St Mary's Hospital, Oxford Road, Manchester, M13 9WL.  Tel: +441617012137 |
| **NT- Pro BNP (N-terminal portion of ProBNP)** | **NTPR**\* | Plain 7ml |  |  | Done as per part of Suspected Transfusion work up. If not received on same day, the sample needs to be separated. | Biochemistry St. Vincent's.[(6)](#_References:)  Tel: 01 2214550 |
| **Oestradiol (Paed)** | **OESP**\* |  | **Plain 2ml** |  | Separate and fridge if not sent on the same day. | SAS Endocrine Lab, Specialist Lab Medicine, Block 46,Beckett St. Leeds, LS97TF Tel: +44 1132067043 |
| **Oligosaccharides** | **OLIG** |  | Urine |  | Stable at 2 - 8ºC or RT | Heather Church,  Willink Unit Genetic Medicine [(13)](#_References:), 6th Floor, POD 1, St Mary's Hospital, Oxford Road, Manchester, M13 9WL.  Tel: +441617012137 |
| **Organic Acids** | **ORG**\* |  | Urine |  | Transfer urine from MSU to 10 ml tube and freeze ASAP.  Dipstick urine samples for organic acids for pH  If the urine is alkaline (pH≥8.5), continue to dispatch the alkaline urine sample to CHI Temple Street AND request a repeat urine sample on the patient and send on to Temple Street as soon as possible | Biochemistry Dept, Children’s Health Ireland at Temple St.[(4)](#_References:)  Tel : 01 8784272 |
| **Orotic Acid** | **ORO** |  | Urine |  | Contact Metabolic Lab in Temple St. | Biochemistry Dept, Children’s Health Ireland at Temple St.[(4)](#_References:)  Tel : 01 8784272 |
| **Oxcarbazepine** | **OXCA** | Plain 7ml |  |  | Separate and freeze | Medlab Pathology (TDL) [(12)](https://tdlpathology.com/test-information/a-z-test-list/i/)  Tel: 01 293 3690 |
| **Parathyroid Hormone (PTH)** | **PTH**\* | 2 x EDTA 3ml |  | 7 days | An EDTA whole blood sample is suitable for samples received Monday to Thursday. There is a requirement to separate and & freeze samples on Fridays, as samples are only stable for 48 hours. | Biochemistry Dept, The Mater Hospital, Tel: 01 8032383 |
| **Paediatric -Parathyroid Hormone (PTH)** | **PTHP** |  | **Plain Serum 1.3ml** | 5 days | Separate and freeze immediately (within 20 mins) measure plasma calcium at same time | Biochemistry Dept, Children’s Health Ireland at Temple St.[(4)](#_References:)  Tel : 01 8784272 |
| **Phenobarbitone (Paed)** | **PHBP**\* |  | Plain /Heparin 1.3ml |  | Separate and fridge | Biochemistry Dept, Children’s Health Ireland at Temple St. [(4)](#_References:)  Tel : 01 8784272 |
| **Phenobarbitone** | **PHB**\* | Plain 7ml |  | 2 days | Stable after spinning on gel. | Biochemistry Dept, Beaumont Hospital [(9)](#_References:)Tel: 01 8092668 |
| **Phenylalanine (PKU)** | **PHAL**\* |  | Heparin 1.3ml |  | Spin and separate sample | Biochemistry Dept, Children’s Health Ireland at Temple St. [(4)](#_References:)  Tel : 01 8784272 |
| **Phenytoin (Paed)** | **PHNP**\* |  | Heparin 1.3ml |  | Separate and fridge | Biochemistry Dept, Children’s Health Ireland at Temple St.[(4)](#_References:)  Tel : 01 8784272 |
| **Phenytoin (Epanutin)** | **PHN**\* | Plain 7ml |  | 5 days | Stable after spinning on gel. | Biochemistry Dept, Beaumont Hospital [(9)](#_References:)Tel: 01 8092668 |
| **Plasmalogens** | **PLMG** |  | 3 x EDTA 1.3ml |  | 3 EDTA samples required. Send unseparated. Samples must be received in the Willink within 48 hours of blood draw. (Can be sent with white cell enzymes). | Heather Church,  Willink Unit Genetic Medicine [(13)](#_References:), 6th Floor, POD 1, St Mary's Hospital, Oxford Road, Manchester, M13 9WL.  Tel: +441617012137 |
| **Porphyrins** | **POR** | EDTA 3ml | EDTA 1.3ml |  | Send primary sample urgently during routine hours. If samples can't be sent immediately separate sample and freeze until next routine day. Cover in tinfoil at all times. | Biochemistry Dept, St James Hospital[(3)](http://search.stjames.ie/Labmed/)  Tel : 01 4162918 |
| **Progesterone** | **PROG**\* | Plain 7ml / Heparin 4ml |  | 7 days | Spin to separate from cells in gel tubes. | Biochemistry Dept, The Mater Hospital,  Tel: 01 8032383 |
| **Prolactin**  **(Macroprolactin)** | **PRO**\* | Plain 7ml / Heparin 4ml |  | 7 days | Spin to separate from cells in gel tubes.  (Macroprolactin will be analysed if Prolactin is raised) | Biochemistry Dept, The Mater Hospital,  Tel: 01 8032383 |
| **Prostate Specific Antigen (PSA)** | **PSA**\* | Plain 7ml |  |  | Separate and fridge. | Biochemistry St. Vincent's.[(6)](#_References:)  Tel: 01 2214550 |
| **Pseudocholinesterase** | **CHOI**\* | Plain 7ml | **Plain 2ml** |  | Measured with Cholinesterase | Biochemistry Dept, St James Hospital[(3)](http://search.stjames.ie/Labmed/)  Tel : 01 4162918 |
| **Purine / Pyrimidine** | **PUPY** |  | Urine |  | Transfer urine from MSU to 10 ml tubes. Freeze immediately | Purine Research Lab, Biochemical Sciences, 4th Floor, North Wing St Thomas Hospital [(10)](http://www.viapath.co.uk/test-alphabetical?location=113&department=130&laboratory=148&letter=&=Apply), London, SE1 7EH Tel: +442071881266 |
| **RAST for Latex** | **RAS**\* | Plain 7ml | **Plain 2ml** | 10 days | Separate and fridge. Please write RAST for Latex if written on form to prevent full RAST profile being done. | Immunology Dept, St James Hospital[(3)](http://search.stjames.ie/Labmed/)  Tel : 01 4162918 |
| **Renin** | **REN**\* | EDTA 3ml |  |  | Separate and freeze within 40 minutes | Eurofins Biomnis [(11)](https://www.eurofins-biomnis.com/en/services/test-guide/) Tel: 01 2958545 |
| **Rivotril (Clonazepam)** | **CLON**\* | EDTA 3ml |  |  | Spin and separate from cells. | Medlab Pathology [(2)](http://www.sonichealthcare.ie/test-information/tests-a-z/tests-a.aspx) Tel: 01 293 3690 |
| **Salicylate** | **SALI**\* | Plain 7ml |  | 5 days | Stable after spinning on gel. | Biochemistry Dept, Beaumont Hospital [(9)](#_References:) Tel: 01 8092668 |
| **SHBG(Sex hormone binding globulin)** | **TEST**\* | Plain 7ml |  | 14 days | Separate if not sent within the day. When SHBG is requested order a TEST profile. | Endocrinology Dept, St. Vincent's.[(6)](#_References:) Tel: 01 2213107 |
| **Tacrolimus (FK506 / Prograf )** | **TACR** | EDTA 3ml |  |  | Trough samples required, and to be sent to SVUH before 10:30am. Place in Fridge overnight if not sending until next day. | Immunology Lab, St. Vincent's.[(6)](#_References:)  Tel: 01 2214550 |
| **Tegretol (Carbamazepine)** | **CARB**\* | Plain 7ml | Heparin 1.3ml | 5 days | Spin to separate from cells. Stable on gel. | Biochemistry Dept, Beaumont Hospital [(9)](#_References:) Tel: 01 8092668 |
| **Teicoplanin** | **TEIC**\* | Plain 7ml |  |  | Spin to separate from cells. Stable on gel | Medlab Pathology [(2)](http://www.sonichealthcare.ie/test-information/tests-a-z/tests-a.aspx) Tel: 01 293 3690 |
| **T3 Free**  **(Tri-Iodothyronine)** | **T3**\* | Plain 7ml |  | 7 days | Spin to separate from cells in gel tubes. Remove from gel after 24 hours. Stable in 2° tubes in fridge for 6 days at 2 - 8°C. | Biochemistry Dept, The Mater Hospital, Tel: 01 8032383 |
| **Testosterone** | **TEST**\* | Plain 7ml | **Plain 2ml** | 14 days | Separate if not sent within the day. | **Adult:** Endocrinology Dept, St. Vincent's. Tel : 01 2213107 [(6)](#_References:)  **Paed:** Endocrinology Dept, St James Hospital[(3)](http://search.stjames.ie/Labmed/) Tel: 01 416 2991 |
| **Thyroid Antibodies (Anti - TPO)** | **THYA**\* | Plain 7ml | Heparin 1.3ml | 7 days | Adult: Spin to separate from cells in gel tubes. Remove from gel after 8 hours. Stable in 2 ° tubes in fridge for 72 hours at 2 - 8°C. | Biochemistry Dept, The Mater Hospital, Tel: 01 8032383 |
| **Thyroid Receptor Antibody (TRAB)** | **TRAB**\* | Plain 7ml |  |  | Spin to separate from cells in gel tubes. Stable on gel over the weekend. | Endocrinology Dept, St James Hospital [(3)](http://search.stjames.ie/Labmed/) Tel 01 4162991 |
| **Topiramate (Topamax)** | **TOPI**\* | Plain 7ml |  |  | Spin to separate from cells in gel tubes. | Medlab Pathology [(2)](http://www.sonichealthcare.ie/test-information/tests-a-z/tests-a.aspx) Tel: 01 293 3690 |
| **Toxicology Screen** | **TOX**\* | Urine | Urine | 5 days | 1 – 2 ml sufficient. Handwrite test on sample container. | Drug Treatment Centre[(17)](#_References:_1), Mc Carthy Centre,30/31 Pearse Street  (01) 648 8600 |
| **Transferrin Isoforms** |  |  |  |  | See **Isoelectric Focusing of Transferrin** |  |
| **Quadruple Test (Second trimester screen)** | **TRT**\* | Plain 7ml |  | 21 days | Serum must be taken at 15 - 20 weeks (usually 16 weeks). Separate and fridge. Requires special form. Only send out Mon - Thurs. For interpretation enquires contact Carol Mason at Tel: 0044 1223216447 | Clinical Biochemistry, Level 4, Addenbrookes Hospital, Cambridge CB2 2QQ.  Tel 00441223217157 |
| **Troponin T (Paed)** | **TROT**\* |  | Heparin 1.3ml |  | Separate if not sent within the day. Not a useful test until child is > 7 months old | Biochemistry Dept, Tallaght Hospital [(8)](#_References:) Tel: 01 4143951 |
| **Troponin T (Adult)** | **TROA**\* | Plain 7ml |  |  | Spin and separate from cells. **Send out urgently.** It is recommended that two Troponin specimens are taken for measurement, the first at presentation and the second at a minimum of 6 hours later. | Biochemistry Dept, St. Vincent's.[(6)](#_References:)  Tel 01 2214550 |
| **Tryptase** | **TRYP**\* | Plain 7ml or EDTA |  |  | Separate and freeze immediately. Samples should be collected up to 1 hr, 3 hr, 12 hrs and 24hrs post event. Label each sample with time and sample type. Samples should be accompanied with relevant clinical information. Lithium heparin samples are unsuitable. | Immunology Dept, St James Hospital [(3)](http://search.stjames.ie/Labmed/)  Tel : 01 4162924 |
| **Urine Steroid Profile** | **UST**\* |  | Urine |  | If child on steroids, state clearly on request form. | Biochemistry Laboratory, King's College Hospital [(14)](http://www.viapath.co.uk/our-tests/urine-steroid-profile), Denmark Hill, London. SE5 9RS Tel : 00442077374000 or 00442073463445 |
| **Urine Sulphite Oxidase** | **USO** |  | Urine |  | Transfer urine from MSU to 10 ml tube and freeze 1ml of Urine frozen required. | IMD Section, Clinical Chemistry, Laboratory Medicine Block, Children’s Hospital , Whittall Street, Birmingham B46NL, Tel : 00441213339942 |
| **Unsuitable sample (Referral)** | **UXCR** |  |  |  | Test code to be used in the event of an unsuitable sample being received. Put in reason for sample unsuitability also. Phone clinical area and record in phone record of Winpath. | Not Sent |
| **Valproic Acid (Epilim)** | **VALP**\* | Plain 7ml | **Plain 2ml** | 5 days |  | Biochemistry Dept, Beaumont Hospital [(9)](#_References:) Tel: 01 8092668 |
| **Vancomycin (Trough, Peak or Random)** | **VAN 1**\* **(Trough) VAN2**\* **(Peak) VANR**\* **(Random)** | Plain 7ml | **Plain 2ml** | 24 hours | State if Trough, Peak or Random. Separate and freeze if not sent within 24 hours.  (Trough = Pre, Peak = Post ) | Biochemistry Dept, St. Vincent's. [(6)](#_References:)  Tel: 01 2214550 |
| **Venlafaxine (Effexor)** | **EFF** | Plain 7ml |  |  | Spin to separate from cells. Stable on gel | Medlab Pathology [(2)](http://www.sonichealthcare.ie/test-information/tests-a-z/tests-a.aspx) Tel: 01 293 3690 |
| **Vitamin A (Retinol)** | **VITA**\* | Plain 7ml | **Plain 2ml** |  | Light sensitive, ensure sample is covered in foil when taking the sample, spinning and separating. Separate and freeze covered in foil. | Biochemistry Dept, St James Hospital [(3)](http://search.stjames.ie/Labmed/)  Tel : 01 4162918 |
| **Very Long Chain Fatty Acid** | **LCFA**\* |  | **EDTA** |  | See Peroxisomal Disorders section below. |  |
| **Vitamin B6 (Pyridoxine)** | **VB6** | EDTA 3ml |  |  | Light sensitive, ensure sample is covered in foil when taking the sample, spinning and separating. Separate and freeze covered in foil. | Medlab Pathology (TDL) [(12)](https://tdlpathology.com/test-information/a-z-test-list/i/) Tel: 01 293 3690 |
| **Vitamin D**  **(Vitamin D3)** | **VITD**\* | Plain 7ml | **Plain 2ml** |  | Serum sample, Spin to separate if on gel and store in fridge ifbeing sentwithin 4 days. Separate and freeze if sample not due to be received in SVUH within 4 days | Metabolic Unit, Biochemistry, St. Vincent’s. Tel: 01 2214672 [(6)](#_References:) |
| **Vitamin E** | **VITE**\* | Plain 7ml | **Plain 2ml** |  | Light sensitive, ensure sample is covered in foil when taking the sample, spinning and separating. Separate and freeze covered in foil. | Dept, St James Hospital [(3)](http://search.stjames.ie/Labmed/)  Tel : 01 4162918 |
| **Vitamin K** | **VITK** | Plain 7ml |  |  | Sample must be kept protected from light at all times by tin foil. Spin and separate sample and it is stable in the fridge over the weekend. | Medlab Pathology [(2)](http://www.sonichealthcare.ie/test-information/tests-a-z/tests-a.aspx) Tel: 01 293 3690 |
| **Zinc** | **ZINC**\* | Serum/  Urine | Serum/  Urine |  | **Blood:** Trace metal tube required from Tallaght Hospital  **Urine :** 24 hour collection in acid washed containers received from Tallaght Hospital | Biochemistry Dept, AMNCH Tallaght Hospital [(8)](#_References:). Tel : 01 4143951 |
| **Zonegram (Zonisamide)** | **ZONE** | Plain 7ml |  |  | Separate and freeze. | Biomnis Tel: 01 2958545 |

\*Test codes marked with an asterisk are orderable through the patients’ electronic chart - Cerner Powerchart

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Hypoglaemia workup**: Please use the form **RF-CS-BIO-41** when labelling samples. | | | | | | |
| **Test** | **Code** |  | **Paed: Cap** | **TAT** | **Special Requirements** | **Referral Centre** |
| **Glucose,**  **β-OH Butyrate, Lactate** | **HGW** |  | Fluoride 1.2ml |  | Separate and freeze immediately  **(within 20mins)** | Biochemistry Dept, Children’s Health Ireland at Temple St.[(4)](#_References:)  Tel : 01 8784272 |
| **Insulin,**  **Cortisol &**  **Growth Hormone** | **INSP, CORP, GHP** |  | **Plain 2ml** |  | Separate and freeze immediately. |
| **C-Peptide** | **PCP** |  | **Plain 2ml** |  | Separate and freeze immediately. |
| **Amino Acids** | **AMA** |  | Heparin 1.3ml |  | Separate and store in fridge. |
| **Ammonia** | **AMM** |  | Heparin 1.3ml |  | Separate and freeze immediately. |
| **Acylcarnitine** | **ACAT** |  | Guthrie Card |  |  |
| **Organic Acids** | **ORG** |  | Urine |  | NB - RecoTransfer urine to 10 ml secondary tube and freeze immediately. Dipstick urine samples for organic acids for pH  If the urine is alkaline (pH≥8.5),  continue to dispatch the alkaline urine sample to CHI Temple Street AND request a repeat urine sample on the patient and send on to Temple Street as soon as possible |
| Note: A second fluoride oxalate (yellow) sample may be taken if Glucose is to be analysed in NMH lab. | | | | | | |

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| **Peroxisomal Disorders** | | | | | |
| **Test** | **Code** | **Paed sample** | **TAT** | **Special Requirements** | **Referral Centre** |
| **Very Long chain fatty acids** | **LCFA** | EDTA 1.3ml X3 | 4 working weeks | Separate and freeze ASAP  General peroxisomal disorders, VLCFA oxidation defects and X-Linked ALD.  To reach the laboratory within 72 hrs | Heather Church,  Willink Unit Genetic Medicine [(13)](#_References:), 6th Floor, POD 1,  St Mary's Hospital, Oxford Road, Manchester, M13 9WL.  Tel: +441617012137  Fax: 0161-70-12303 |
| **Phytanic and Pristinic Acid** | **PHY** |  | Send primary sample. **Do not separate.** |
| **Plasmalogens** | **PLMG** |  | Send primary sample. **Do not separate.** Protect sample from light. Cover in tinfoil at all times. |
| **Lysosomal Enzymes (Lysosomal storage disease/White cell enzymes)** | **WCE** | EDTA 1.3ml X3 |  | Send primary sample. **Do not separate.** To reach the laboratory within 72 hrs |

References:

1. Children’s Health Ireland at Crumlin online Lab manual: <http://olchlab.return2sender.ie/Default.aspx>
2. MedLab Pathology online Lab manual: <http://www.sonichealthcare.ie/test-information/tests-a-z/tests-a.aspx>
3. St James Hospital online Lab manual: <http://search.stjames.ie/Labmed/>
4. Children’s Health Ireland at Temple St DPLM Test requirements manual: EXT-CS-LM-42
5. Protein Reference Unit, Sheffield Northern General Hospital online Lab manual: <https://www.immqas.org.uk/pru.asp?ID=316>
6. St Vincent’s Hospital Pathology User Handbook: EXT-CS-LM-43
7. Sheffield Children's NHS Foundation Trust User's Handbook: EXT-CS-BIO-98
8. AMNCH Tallaght Lab user manual: EXT-CS-LM-53
9. Beaumont Hospital Lab user manual: EXT-CS-LM-52
10. Thomas’ Hospital online user manual: <http://www.viapath.co.uk/test-alphabetical?location=113&department=130&laboratory=146&letter>=
11. Eurofins Biomnis online user manual:<https://www.eurofins-biomnis.com/en/services/test-guide/>
12. TDL online user manual: <https://tdlpathology.com/test-information/a-z-test-list/a/>
13. Willink lab manual: EXT-CS-SR-8
14. Steroid laboratory at King's College Hospital: <http://www.viapath.co.uk/our-tests/urine-steroid-profile>
15. Dept. of Neuroimmunology, Institute of Neurology, UCL: <https://www.uclh.nhs.uk/OurServices/ServiceA-Z/Neuro/NEURI/Pages/Testdirectory.aspx>
16. St James's University Hospital, Leeds: <http://www.sas-centre.org/assays/hormones/5a-dihydrotestosterone>
17. HSE National Drug Treatment Centre Lab manual: EXT-CS-BIO-173

**Note:** If the Biochemical investigation required is not listed in above please contact the Biochemistry laboratory directly at Ext: 3546

## Retrospective Requesting/Additional Requests

Routine specimens are retained in the Biochemistry laboratory for up to one week, refrigerated at 2 – 6˚ C. Analyses of additional tests are subject to specimen integrity and analyte stability. Add on facility only available for routine biochemistry samples up to 8 hours from sample draw. Telephone requests for additional analyses are accepted from clinicians but must be followed up with the appropriate add-on request form.

## Reference Ranges and Critical Alert Ranges

Adult reference ranges quoted by the Biochemistry laboratory refer to non-pregnant females

A critically abnormal result may or may not be unexpected. It may be due to a disease process, the effect of treatment or it may be artifactual. A critically abnormal result must always be reported urgently by telephone to clinical staff as per PP-CS-BIO-10. The telephoning of reports is documented in the telephone audit log on Winpath.

Figure 22: Reference Ranges for In House Testing

| **Analyte (Plasma)** | **Method** | **Reference range** | **Units** | **Reference Source** |
| --- | --- | --- | --- | --- |
| Sodium | Indirect ISE | Neonate: 133 - 146  Adult: 133-146 | mmol/L | Pathology Harmonisation UK  Pathology Harmonisation UK |
| Potassium | Indirect ISE | Neonate: 3.4 – 6.0  Adult: 3.5 – 5.0 | mmol/L | Pathology Harmonisation UK  Kumar and Clark |
| Chloride | Indirect ISE | Neonate: 96 - 110  Adult: 95-108 | mmol/L | Anne Green  Pathology Harmonisation UK |
| Urea | Kinetic urease | Neonate: 1.0 – 5.0  Adult: 2.8 – 7.2 | mmol/L | Anne Green  Beckman Coulter |
| Creatinine | Traditional Kinetic Jaffe | Neonate:  Up to 7days:13 – 81  7days to 1 yr:10 – 60  Adult:  58 – 96 (Female)  74-110 (Male <50 years)  72-127 (Male >50 years) | µmol/L | Anne Green  Anne Green  Beckman Coulter  Beckman Coulter  Beckman Coulter |
| Urate | Endpoint uricase | Adult:  140 – 360 (Female)  200 – 430 (Male) | µmol/L | Pathology Harmonisation UK  Pathology Harmonisation UK |
| Glucose | Hexokinase + G6PD | Neonate: 3.9 – 5.6  Adult:  Fasting: 3.9 – 5.6 | mmol/L | ADA/ EXT-CS-BIO-165  ADA |
| Glucose Challenge Test (GCT) | Hexokinase + G6PD | Adult: < 7.8 | mmol/L | PP-CS-DB-2 Antenatal Screening for Gestational Diabetes |
| Antenatal Glucose Tolerance Test | Hexokinase + G6PD | Adult:  Fasting: <5.3  1 Hour: <10.0  2 Hours: <8.6  3 Hours: <7.8 | mmol/L | PP-CS-DB-2 Antenatal Screening for Gestational Diabetes |
| Calcium/  Corrected Calcium | Arsenazo III | Neonate: 2.00 – 2.70  Adult: 2.20 – 2.60 | mmol/L | Pathology Harmonisation UK  Pathology Harmonisation UK |
| Phosphate | Phosphomolybdate UV | Neonate: 1.30 – 2.60  Adult: 0.80 – 1.60 | mmol/L | Pathology Harmonisation UK  Kumar and Clark |
| Bilirubin-Direct | Diazo | Neonate:  0 to 10 days: <20  Adult: <4 | µmol/L | Anne Green  Beckman Coulter |
| Bilirubin-Total | DPD | Neonate:  0 to 1 day: 24 - 149  1 to 2 days: 58 - 197  3 to 14 days: 26 - 205  Adult: < 21 | µmol/L | Beckman Coulter  Beckman Coulter  Beckman Coulter  Pathology Harmonisation UK |
| Total Protein | Biuret | Neonate: 46 -70  Adult: 60 - 80 | g/L | Tietz  Pathology Harmonisation UK |
| Albumin | BCG | Neonate: 30 - 45  Adult: 35 - 50 | g/L | Pathology Harmonisation UK  Pathology Harmonisation UK |
| Magnesium | Xylidyl Blue( Mand Y) | Neonate: 0.60 – 1.00  Adult: 0.70 – 1.00 | mmol/L | Pathology Harmonisation UK  Pathology Harmonisation UK |
| Osmolality | Freezing Point/VP | Neonate: 275 - 295  Adult: 275 - 295 | mOsm/kg | Anne Green  Pathology Harmonisation UK |
| AST | Tris buffer without PLP | Neonate: 25 - 75  Adult: < 40 | IU/L | Beckman Coulter  Kumar and Clark |
| ALT | Tris buffer without PLP | Neonate: 13-45  Adult: 0 - 35 | IU/L | Beckman Coulter  Beckman Coulter |
| LDH | L to P glucamine [IFCC] | Neonate:  0-4days: 290 - 775  4-10days: 545 - 2000  10d-1yr: 180 – 430  Adult: <247 | IU/L | Beckman Coulter  Beckman Coulter  Beckman Coulter  Beckman Coulter |
| CK | NAC[IFCC] | Neonate: 0 - 171  If the level is greater than 171 the following comment should be added  ' Note: Adult reference rangequoted. Higher levels may be seen in neonates (up to 10 fold those in adults) with a marked fall occurring during the first week of life reaching adult levels by 6 - 10 weeks.'  Female: 0 – 145  Male: 0 – 171 | IU/L | Beckman Coulter  Anne Green  Beckman Coulter  Beckman Coulter |
| ALP | AMP Buffer | Neonate:  Up to 1 month:70 – 380  1 month to 12 months: 60 – 425  Adult:  Non pregnant: 30 – 130 | IU/L | Pathology Harmonisation UK  Pathology Harmonisation UK |
| Amylase | G7 substrate [IFCC] | Adult: 0 - 100 | IU/L | Beckman Coulter |
| Triglycerides | GPO | Neonate: 0.0 – 1.90  Adult: 0.0 – 1.90 | mmol/L | Anne Green  Irish Heart Foundation |
| CRP | Immuno-turbidimetric | Neonate: <5  Adult: <5 | mg/L | Beckman Coulter  Beckman Coulter |
| Gentamicin | EIA | Neonate:  Trough: 0-2  Peak: 5-10  Adult:  Trough: <1  Peak: 10-20 | mg/L | PP-CS-NEO-123 Administration of Gentamicin to a Neonate  PP-CS-IC-17 Adult Antimicrobial Guideline |
| Total Bile Acids | Thio NAD-Thio NADH | 0-10 | µmol/L | Audit Diagnostics |
| Oestradiol | Electrochemiluminescence immunoassay | Female:  Follicular phase: 45.4 – 854  Ovulation phase: 151 – 1461  Luteal phase: 81.9 – 1251  Post menopause: < 505  Male: 41.4 - 159 | pmol/L | Roche |
| CA125 | Electrochemiluminescence immunoassay | 0-35 | U/mL | Roche |
| HCG | Electrochemiluminescence immunoassay | <5.3 | mIU/mL | Roche |
| Anti-Mullerian Hormone | Electrochemiluminescence immunoassay | 20 – 24 years 8.7 – 83.6  25 – 29 years 6.4 – 70.3  30 – 34 years 4.1 – 58.0  35 – 39 years 1.1 – 53.5  40 – 44 years 0.2 – 39.1  45 – 50 years 0.2 – 19.3 | pmol/L | Roche |
| sFlt-1/PlGF ratio. | Electrochemiluminescence immunoassay | Ratio <39 (20-40wks gestation): Rule out PE for at least 1 week  Ratio 39 - 84 (20-33+6 wks gestation): Moderate/High risk of developing PE  Ratio 39 - 109 (≥34 wks gestation) : Moderate/High risk of developing PE  Ratio >84 (20-33+6 wks gestation): Very high risk of developing PE  Ratio >109 (≥34 wks gestation): Very high risk of developing PE | Ratio | Roche |
| Free T4 | Electrochemiluminescence immunoassay | Neonate:  0 – 6 days 11.0 – 32.0  >6 days – 3 months 11.5 – 28.3  >3 – 12 months 11.9 – 25.6 | pmol/L | Roche |
| Adult:  Non-pregnant: 12-22  Trimester specific:-  First Trimester: 12.1-19.6  Second Trimester: 9.6-17.0  Third Trimester: 8.4-15.6 | Roche |
| TSH | Electrochemiluminescence immunoassay | Neonate:  0 – 2 days 5.0 –40  3 days – 11 years 0.7 – 5.5 | mIU/L | Roche/National Newborn Screening Programme |
| Adult  Non-pregnant:  11-20 years: 0.51 – 4.30  >20 years: 0.27 - 4.2  Trimester specific:  First Trimester: 0.1- 3.1  Second Trimester: 0.2-3.3  Third Trimester: 0.4-3.6 | EXT-CS-BIO-161 |
| Ferritin | Electrochemiluminescence immunoassay | Adult:  Female: 13 – 150  Male: 30 – 400 | µg/L | Roche |
| Free ßHCG  PAPP-A | Electrochemiluminescence immunoassay. | Reference ranges are not applicable. Results are used in conjunction with ‘Viewpoint’ software for the calculation of risk for fetal aneuploidy. | IU/L  U/L |  |
| **Analyte (CSF)** | **Method** | **Reference range** | **Units** | **Reference Source** |
| CSF Protein | Pyrogallol Red | <28 days 0.65 - 1.5 g/L  28 to 56 days 0.5 - 0.9 g/L  56 days to 18 yrs 0.05 - 0.35  18 to 60 years 0.15 - 0.45  Over 60 years 0.15 - 0.6 | g/L | EXT-CS-BIO-152 UK Standards for Microbiology Investigations Investigation of Cerebrospinal Fluid |
| CSF Glucose | Hexokinase + G6PD | <28 days 1.9 - 5.6 mmol/L  28 to 58 days 1.6 - 5.6 mmol/L  58 days to 1 year 1.9 - 5.0 mmol/L  1 year + 2.2 - 4.4 mmol/L | mmol/L |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Analyte (Urine)** | **Method** | **Reference range** | **Units** | **Reference Source** |
| Spot Sodium | Indirect ISE | No Range Quoted.  Interpret in conjunction with corresponding plasma result. | mmol/L |  |
| Spot Potassium | Indirect ISE | mmol/L |
| Spot Chloride | Indirect ISE | mmol/L |
| Creatinine Clearance | Calculation | 90-130 | ml/min | Jacques Wallach |
| 24h Urine Protein | Pyrogallol Red | Adult:  Non Pregnant <0.15 | g/24h | Tietz |
| Protein : Creatinine Ratio | Calculation | Adult:  Non Pregnant 0-15 | mg/mmol |  |
| Osmolality | Freezing Point/VP | No Range Quoted.  Interpret in conjunction with plasma osmolality. | mOsm/kg |  |

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### Biochemistry Reference Ranges in Pregnancy

The Reference ranges quoted for women on Biochemistry reports refer to the **non-pregnant** state. In general, levels of plasma analytes tend to be lower in pregnant women mainly due to hemodilution as a result of plasma volume expansion. However, there are some analytes that increase during pregnancy (Plasma Alkaline Phosphatase, Plasma Urate and Urinary Protein). The minor plasma concentration changes that occur during pregnancy of **Inorganic Phosphate, CRP, Direct Bilirubin, ALT, AST, CK, LDH, Amylase and Bile Acids** are considered not clinically significant and non-pregnant Reference Ranges can be used to interpret the results of these analytes.

The table below is intended to act as a guide to the changes that occur to Biochemistry References Ranges during pregnancy. However, care must be taken in the interpretation of results as there can be variation among pregnancies and also within trimester specific ranges particularly for analytes where there are changes in concentrations as pregnancy progresses e.g. Albumin, ALP.

Figure 23: Guide to Biochemistry Reference Ranges in Pregnancy

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Plasma Analyte** | **Units** | **Non Pregnant**  **Reference Range**  **(NMH reports)** | | **1st Trimester**  **Ref Range** | **2nd Trimester**  **Ref Range** | **3rd Trimester**  **Ref Range** |
| Sodium | mmol/L | 133 - 146 | | 130- 143 | | |
| Potassium | mmol/L | 3.5 – 5.0 | | 3.3 – 4.8 | | |
| Chloride | mmol/L | 95 - 108 | | 94 - 107 | | |
| Urea | mmol/L | 2.8 – 7.2 | | 1.9 – 5.0 | | |
| Creatinine | umol/L | 58 - 96 | | 43 - 76 | | |
| Total Bilirubin | umol/L | 0 – 21 | | 0 - 14 | | |
| Total Calcium | mmol/L | 2.20 – 2.60 | | 2.15 – 2.55 | 2.10 – 2.50 | |
| Total Protein | g/L | 60 - 80 | | 55 - 74 | 52 - 68 | 50 - 66 |
| Albumin | g/L | 35 - 50 | | 33 - 47 | 29 - 41 | 27 - 39 |
| ALP | IU/L | 30 - 130 | | 27 - 120 | 30 - 130 | 80 - 360 |
| Magnesium | mmol/L | 0.70 – 1.0 | | 0.64 – 0.92 | | 0.61 – 0.87 |
| Urate | umol/L | 140 - 360 | | 110 - 265 | | ‘Less than ( no. of weeks gestation X 10’)  e.g. 34w: <340, 37w: < 370 etc |
| Free T4 | pmol/L | 12 - 22 | | 12.1 - 19.6 | 9.6 - 17.0 | 8.4 - 15.6 |
| TSH | mIU/L | 11-20 years | 0.51 – 4.30 | 0.1 - 3.1 | 0.2 - 3.3 | 0.4 - 3.6 |
| >20 years | 0.27 - 4.2 |
| Ferritin | µg/L | 13 – 150 | | Please refer to PP-CS-CHAE6 Iron Deficiency in Pregnancy | | |
| **Urine Analyte** | **Units** | **Non Pregnant**  **Reference Range**  **(NMH reports)** | | **1st Trimester**  **Ref Range** | **2nd Trimester**  **Ref Range** | **3rd Trimester**  **Ref Range** |
| Urinary Protein | g/24h | <0.15 | | <0.30 | | |
| Protein Creatinine Ratio | mg/mmol | 0 - 15 | | 0 - 30 | | |

*Reference: Gronowski AM, Handbook of Clinical Laboratory Testing During Pregnancy, Humana Press*

Figure 24: Test Results for Telephoning in Biochemistry

|  |  |  |  |
| --- | --- | --- | --- |
| **Analyte** | **Lower Limit** | **Upper Limit** | **Comment** |
| Sodium | <125 mmol/L | >150 mmol/L |  |
| Potassium | <2.9 mmol/L | >6.0 mmol/L | With no visible haemolysis |
| Urea | - | >15.0mmol/L |  |
| Creatinine | - | >200 µmol/L |  |
| Urate | - | >500 µmol/L |  |
| Calcium | <1.70 mmol/L | > 2.80 mmol/L | Always check for EDTA contamination  (low calcium level) |
| Magnesium | <0.4 mmol/L | >1.70 mmol/L |  |
| Phosphate | <0.4 mmol/L | - |  |
| Triglycerides | - | >2.00 mmol/L | Check if patient is on Parenteral Nutrition |
| Albumin | <16 g/L |  |  |
| Direct Bilirubin | -irect Bilirubin | > 20 µmol/L |  |
| Total Bilirubin | - | > 100 µmol/L Adult  >300 µmol/L Neonate | Always comment if sample is haemolysed |
| AST | - | >150 IU/L |  |
| ALT | - | >150 IU/L |  |
| CK | - | >500 IU/L |  |
| LDH | - | >500 IU/L |  |
| Total Bile Acids | - | >10 µmol/L on first finding  Subsequent results only to be phoned if >40 µmol/L. |  |
| Amylase | - | >100 IU/L |  |
| CRP | - | >30 mg/L Neonate  > 100 mg/L Adult |  |
| CSF glucose&  protein |  |  | Always phone CSF results |
| Gentamicin | - | >10 mg/L Neonate  >20 mg/L Adult |  |
| Adult Free T4 (FT4) | <10 pmol/L | > 29 pmol/L |  |
| Paediatric Free (FT4) | Any result outside the reference range | Any result outside the reference range |  |
| Adult TSH | <0.01 mIU/L | > 5.0 mIU/L |  |
| Paediatric TSH | < 0.1 mIU/L | > 10 mIU/L |  |
| Glucose | <2.5 mmol/L | > 15.0 mmol/L |  |
| Glucose Challenge Test(GCT) | - | >10.0 mmol/L |  |
| Oral Glucose Tolerance Test  (OGTT) | - | Any result > 15.0 mmol/L |  |
| Gestational Glucose  (GEST) | - | Fasting ≥ 7.0 mmol/L  and/or  1 Hour PP ≥ 11.1 mmol/L |  |

# Blood Transfusion Department

Figure 25: Blood Transfusion Tests

| **Test/Profile and request form (if not using MN-CMS)** | **MN-CMS Test Profile** | **Container Type(Vol)** | **Turnaround  Times**  from time of specimen receipt in laboratory | **Special Requirements**  All specimens must be handwritten with Hospital Number, patient name date of Birth and signed by the collector | **Accreditation Status** |
| --- | --- | --- | --- | --- | --- |
| Cord Blood Group and Coombs  LF-BTR-CRREQ Rev 2 | Cord Blood Group and DAT, blood NMH | EDTA 6ml | 1-36 hours as per Special requirements | Cord specimens. Specimens analysed once daily in the morning. Contact laboratory if urgent due to maternal antibodies. | Accredited |
| Group and Coombs  Paediatric  LF-BTR-XREQ Rev 3 | Blood Group and DAT, Paed NMH | EDTA 3ml | Same Day | PATIENT MUST BE WEARING AN ID ARMBAND  **Out of hours:**  Available when bilirubin is raised and result is required for blood or product issue.  When Cord Bloods were not received and the mother is RhD Neg and may require Anti-D urgently.  When a maternal antibody is present and Cord bloods are not available for testing i.e. Maternal antibody first identified post natally / transfer baby | Accredited |
| Group and Antibodies  (Type and Screen)  LF-BTR-XREQ Rev 3 | Inpatient Group and Antibody Screen NMH | EDTA 9ml | 24 hrs  Urgent 1 hour\* | PATIENT MUST BE WEARING AN ID ARMBAND  BT lab / on-call scientist to be phoned if the group and antibodies is deemed urgent.  \*The presence of a positive antibody screen will increase turnaround times.  These samples remain suitable for x-matching blood up to 72 hrs from the time of phlebotomy. | Accredited |
| Outpatient Group and Antibodies  LF-BTR-GCREQ Rev 3 | Outpatient group and antibody screen NMH | EDTA 9ml | 1 Routine Day | These patients do not have to wear an ID armband and therefore the PPID override function can be used in MN-CMS.  However, manual PPID procedures should be followed.  In the case of community/GP samples please see section 5.2.3 above. These patients EDTA samples can be in 6 / 9ml tubes.  THESE SAMPLES ARE NOT SUITABLE FOR BLOOD COMPONENT PROVISION | Accredited |
| Crossmatch  LF-BTR-XREQ Rev 3 | Red cells NMH or Crossmatch Red Cells NMH | EDTA 9ml | Routine crossmatch requests = 3 hours.  Urgent 1 Hour\* | BT lab / on-call scientist to be phoned if the crossmatch is deemed urgent.  \*The presence of a positive antibody screen will increase turnaround times.  A current valid inpatient group and antibodies sample is required prior to crossmatch requests with ID armband in place  Blood Product Requests created in MN-CMS must be printed and sent to the lab  The clinical area must inform the Blood Bank when a patient with known immune antibodies is admitted to allow adequate time to source suitable blood products | Accredited |
| Uncrossmatched blood | Uncrossmatched, group specific RCC NMH or  Uncrossmatched, O Neg Red Cells NMH | EDTA 9ml | Group Specific = approx 15 minutes  O Negative = STAT\* | The request for uncrossmatched blood must be authorised by a member of the medical staff | Accredited |
| Neonatal Crossmatch | Paed Pack (1-5 NMH) | EDTA 9ml from mother  EDTA 3ml from Neonate | Up to 3 hrs (depending on blood stockarrival from IBTS) | Crossmatched against maternal specimen (correctly labelled with maternal details).  Please check if a current valid sample is available on the mother prior to maternal sample collection. The baby must be transfused the first pedi pack split within the first five days of the units shelf life. For this reason pedi packs should only be ordered where there is an immediate clinical requirement.  Blood Product Requests created in MN-CMS must be printed and sent to the lab | Accredited |
| Transfusion Reaction Investigation | Transfusion Reaction Investigation Adult / Paed NMH | See section 14.9 below | Preliminary 2 hrs  Final 7 days | See Section 14.9 below | Accredited |
| Antenatal Booking | Booking Visit | EDTA 9ml | 1 routine working Day | If patient is not wearing an ID armband an Outpatient Group and antibodies must be selected or if handwriting the sample use form LF-BTR-GCREQRev 3 | Accredited |
| 28 week Antibody check | Outpatient group and antibody screen NMH | EDTA 9ml | 1 routine working Day | It is policy for all RhD negative women and women with antibodies to have a 28 week antibody check | Accredited |
| Antibody Identification | N/A | EDTA 9ml | 0-5 Days | Test initiated by the laboratory.  Depending on the complexity and the requirement for blood or blood products | Accredited |

Figure 26: Blood Transfusion Referral Tests

| **Test/Profile** |  | **Container Type(Vol)** | **Turnaround  Times**  from time of  specimen receipt  in laboratory | **Special**  **Requirements**  All specimens must  be handwritten with  Hospital Number,  patient name and date  of Birth | **Referral Laboratory** | **Accreditation Status** |
| --- | --- | --- | --- | --- | --- | --- |
| Anti D/ Anti-c  Quantitation | Anti- D or Anti- c blood level, NMH | 9ml EDTA x2 | 1 week for verbal report  2 weeks for written report | Please provide EDD when requesting Anti-D/-c quantitation. | IBTS | Reference Laboratory |
| HLA typing | Group and Antibodies Inpatient / Outpatient | 9ml EDTA | 2 weeks | Test request must be accompanied by associated referral form. Contact the Blood Bank to request form | IBTS | Reference Laboratory |
| HLA antibodies | Group and Antibodies Inpatient / Outpatient | 9ml serum sample (clotted) | 2 weeks | Test request must be accompanied by associated referral form. Contact the Blood Bank to request form | IBTS | Reference Laboratory |
| Platelet  Alloantibodies | Group and Antibodies Inpatient / Outpatient | 9ml serum sample (clotted) | 2 weeks | Test request must be accompanied by associated referral form. Contact the Blood Bank to request this form | IBTS | Reference Laboratory |
| NAITP | NAITP investigation, Maternal / Paed / Paternal blood NMH | Mother:9ml EDTA 2X9ml Serum (clotted)  Father:  2 x9mlEDTA  Neonate: 1ml Paediatric EDTA | 2-3 weeks | Request must be authorised by Consultant / Haematologist  Test request must be accompanied by associated referral form. Contact the Blood Bank to request this form | IBTS | Reference Laboratory |
| Foetal Genotyping  in Maternal Blood  Samples of patients with immune antibodies must be handwritten and only to be collected Mon – Thur before 12.30pm to accommodate transport requirements | Fetal genotyping,blood NMH | 9mlx2 EDTA | 2-3 weeks | Test request must be accompanied by associated referral form. Contact the Blood Bank to request this form | NHS BLOOD AND TRANSPLANT | Reference Laboratory |
| Platelet Crossmatching  Samples must be handwritten and only to be collected Mon – Thur before 12.30pm to accommodate transport requirements | N/A | Mother:9ml EDTA 2X9ml **Serum (clotted)**  Father:  2 x9mlEDTA | 2-3 weeks | Test request must be accompanied by associated referral form. Contact the Blood Bank to request form | NHS BLOOD AND TRANSPLANT | Reference Laboratory |
| Fetal RHD screen (cffDNA testing) by the IBTS | Fetal RHD Screen (IBTS), blood NMH | Mother 1 x 9 ml EDTA | 2 weeks | STORE SAMPLE AT ROOM TEMPERATURE  Sample must be accompanied by associated referral form. Contact the Blood Bank to request this form or available on QPulse. MN-CMS printed request forms also appropriate | IBTS | Reference Laboratory |
| Non-invasive  HPA-1A foetal genotyping |  | Mother 1 x 9 ml EDTA |  | STRECK tubes  consultant/Consultant Haematologist request | Sanquin diagnostics, Amsterdam |  |

Figure 27: Blood Transfusion Blood Product Requests

| **Blood Product** | **Test/Profile and request form (if not using MN-CMS)** | **MN-CMS Test Profile** | **Container Type(Vol)** | **Turnaround  Times**  from time of specimen receipt in laboratory | **Special Requirements**  All specimens must be handwritten with Hospital Number, patient name date of Birth and signed by the collector | **Accreditation Status** |
| --- | --- | --- | --- | --- | --- | --- |
| Anti-D (Potentially Sensitising Event - PSE) | Outpatient Group and Antibodies  LF-BTR-GCREQ Rev 3 | Antenatal (PSE) Anti-D Immunoglobulin NMH | 9ml EDTA | 1 routine Day | Indicate the EDD and the reason for request e.g. Antenatal Fall  If requesting Anti-D using MN-CMS the Anti-D must be ordered, the requisition printed and sent to the Blood Bank | Accredited |
| Anti-D (RAADP) | Outpatient Group and Antibodies  LF-BTR-GCREQ Rev 3 | RAADP Anti-D Immunoglobulin NMH | 9ml EDTA | 1 routine Day | Indicate sample is a 28 week / RAADP sample | Accredited |
| Anti-D (Post Natal) | Group and Antibodies  (Type and Screen)  LF-BTR-XREQ Rev 3 | Post Natal Anti-D Immunoglobulin NMH | 9ml EDTA | 1 routine Day | If requesting Anti-D using MN-CMS the Anti-D must be ordered, the requisition printed and sent to the Blood Bank | Accredited |
| Blood Products (non red cells)  Refer to Fig 21 for red cells  Refer to figure below for blood products available from the blood bank | Group and Antibodies  (Type and Screen)  LF-BTR-XREQ Rev 3  Sample may already be available – contact lab | Blood Products Order /Prescribe Adults and Neonates | 9ml EDTA | TAT is dependent on product required and availability – contact lab for approximate estimation | When requesting blood products using MN-CMS the blood product must be ordered, print the requisition and sent to the Blood Bank. | Accredited |

## Storage of Blood Specimens

Blood specimens can be stored for 24 hours at 4˚C if there is a delay in transport to the laboratory. The exception to this is the storage of samples collected for the Fetal Rh D screen, which must be stored at room temperature.

## Specimen Request Form

Please refer to Figure 21 Blood Transfusion Tests for appropriate requests forms if not using MN-CMS. The request form must have the relevant details as outlined below:

1. Patient details: Surname, first name, hospital number, date of birth, ward.
2. Clinical details: Surgical procedure, transfusion and pregnancy history.
3. Signature of person making the request.
4. Signature of the person taking the specimen.
5. GP bloods must indicate the full address of the patient on both specimen and request form.

### Antenatal Blood Grouping and Antibody Screen

Please refer to PP-CS-AN-24 Antenatal Blood Grouping and Red Cell Antibody Screening Policy for frequency and details of tests required.

Cord Blood should be sent for Group and DCT on infants of all Rhesus negative women/ blood group unknown to assess requirement for postnatal Anti-D Ig injection. Anti D Ig will be issued to RhD negative women based on these results. Cord Blood must also be sent for Urgent Group and DCT on infants of women with irregular red cell antibodies and suspected Haemolytic Disease of the Fetus/Newborn (HDFN). Paper request form must supply the demographic details of both the mother and the infant. Please inform the Blood Transfusion laboratory/on call scientist when sending these sample to the laboratory.

### Crossmatch Request

In Addition to the information required under ‘’, please supply the following:

1. Relevant clinical information, antenatal history, blood transfusion history, transfusion reaction etc., patient diagnosis (special conditions require special blood example sickle cell disease requires special antigen negative blood)
2. If specific blood components/products are required i.e. CMV negative, irradiated, this should be requested.
3. The specific surgery or reason for a transfusion request should be indicated
4. A clear indication as to whether the tests/components/products requested are **urgent** or **routine**. All urgent requests must be made by contacting the Blood Transfusion department during routine hours or the medical scientist ‘on call’ at all other times. Where a verbal request is made it must be followed up by a written/printed request form
5. For paediatric / neonatal crossmatch requests a valid maternal sample taken within 72hrs of delivery must be available.
6. A current valid inpatient Type & Screen sample is required for adult RCC requests. This is one that is collected within 72 hours of the transfusion event being completed. A formal exception to this rule exists for placenta praevia and accreta patients, providing they do not have any alloantibodies.
7. It is recommended that a second sample should be taken for the confirmation of the ABO group of a first time patient prior to transfusion, where this does not impede the delivery of urgent red cells or other components. However, it is important that the two samples are taken independently of one another. This recommendation is an important step in mitigating the risks associated with Wrong Blood in Tube.

### Blood Transfusion Laboratory Services at the National Maternity Hospital to Support Termination of Pregnancy Services

The Blood Transfusion Laboratory will accept samples for Blood Group and Rhesus status from General Practitioners and Community based services like the Irish Family Planning Association for women within the NMH catchment area (South Dublin, Wicklow and Kildare) who are seeking abortion. The purpose of this Blood Group is to identify women who are Rhesus Negative and who will require prophylactic Anti-D Ig as part of her abortion treatment.

The Blood Bank returns the results of the blood group via encrypted email. GPs must register with the department and provide their registration number and healthmail account. Details on sample acceptance requirements are issued to each GP along with information on Anti-D Ig for this patient cohort.

If the patient is Rhesus Negative Anti-D Ig prophylaxis is recommended following therapeutic termination of pregnancy to prevent sensitisation and to safeguard any further pregnancy This Anti D may be given post administration of the 1st tablet and should be given no later than 72 hours post ingestion of the second tablet. Service users should contact the Annex Clinic at the National Maternity Hospital to arrange for Anti-D Ig Administration for their patients.

### Routine Antenatal Anti-D Prophylaxis (RAADP) at the NMH

A RAADP service at approximately 28 weeks gestation is offered to all Rhesus D Negative mothers at the NMH in an effort to reduce sensitisation and the production of immune Anti-D.

However, approximately 40% of pregnant Rhesus D negative women will carry a Rhesus-D negative foetus that poses no risk of sensitisation to the mother. This results in these women receiving at least one dose of anti-D immunoglobulin unnecessarily, which has ethical and cost implications.

To avoid this the NMH, via the Irish Blood Transfusion Service (IBTS), offers all known Rhesus D Negative mothers cell free foetal DNA (cffDNA) analysis from their maternal blood sample in order to determine the Rhesus D gene (RHD) status of the foetus, This allows a targeted RAADP and Anti-D Ig prophylaxis approach to the antenatal care of Rhesus D negative women at the NMH.

## Maximum Blood Order Schedule

A maximum blood order schedule is in effect. Please refer to PP-CS-BT-1 Maximum Blood Ordering Schedule for details. The Blood Bank must be informed when a patient with known immune antibodies is admitted to allow appropriate time to source suitable blood products for the patient.

## Massive Haemorrhage Pathway

Please refer to PP-CS-PN-15, Massive Haemorrhage in Obstetrics, and

CG-GYN-INPAT-18, Blood Transfusion Management of Major Haemorrhage in Gynaecology.

## Urgent Blood Product Requests

Urgent blood product requests e.g. the request for ‘Pack 1’ can be made verbally. All blood product requests can be sent to the lab retrospectively either via request forms or MN-CMS printed requisitions.

## Investigation Following Suspected Transfusion Reaction

All implicated blood/product packs with giving set attached must be returned to the Blood Transfusion laboratory with the relevant specimens and completed transfusion reaction form. Two copies of the NMH Transfusion Reaction Form should be printed from MN-CMS and sent to the laboratory. In the event MN-CMS is down a hardcopy is available on Q-Pulse RF-CS-HV-1 Suspected Transfusion Reaction Form. Blood product packs should be stored at room temperature while awaiting investigation.

| **Transfusion Reaction Investigation Test/Profiles** | **Container (Vol)** | **Special Requirements**  **Take all samples post suspected Transfusion reaction.** | **Accreditation Status** |
| --- | --- | --- | --- |
| Type/Screen or Inpatient Group and Antibodies | 9ml EDTA | Specimens must be correctly labelled with hospital Number, patient name and date of birth. Include signature of collector | Accredited |
| FBC | EDTA 5ml |  | Accredited |
| COAG | Citrate 3.0ml |  | Accredited |
| UE, LFT’s, LDH | Lithium Heparin4ml |  | Accredited |
| Haptoglobins | Plain 7ml |  | Accredited |
| MSU | MSU Jar | 1st voided urine | Accredited |
| Blood Cultures Adult | BacT Alert aerobic and anaerobic vials |  | Accredited |
| Blood Cultures Baby | BacT Alert Peds vial |  | Accredited |
| All Blood Packs including giving sets (used and unused) |  | All Blood Packs and Giving Sets are sent to The IBTS for culture | Referred Test |

Figure 28: Suspected Transfusion Reaction Specimen Types

## 

## Reference Ranges and Critical Alert Ranges

* The results are abnormal or unexpected
* The result deviates significantly from previous results.
* Grouping discordance
* In the case of a rise in anti-D quantitation that doubles the previous quantitation, and/or reaches an estimated risk level. (i.e. >4 IU).
* In the case of a rise in anti-c quantitation that doubles the previous quantitation, and/or reaches an estimated risk level. (i.e. >7.5 IU).
* In the case of a rise in antibody titration that doubles the previous and/or reaches an estimated risk level (i.e. >1/32).
* Positive DCT (not related to prophylactic Anti-D administration)
* The presence of a clinically significant irregular antibody will be notified to the clinical area in the event of crossmatched blood requests

## Collection/Delivery of Blood, Components and Blood Products

All movement of blood and platelets is monitored by Blood Track, please refer to PP-CS-HV-11 for further details.

Three emergency O Neg units for adult use and one emergency O Neg unit for neonatal use are available from the theatre blood fridge.

## Intra Uterine Transfusion

Intrauterine transfusion (IUT) of donor red cells is the primary treatment for significant foetal anaemia in pre-term pregnancies where delivery is not appropriate. The process requires excellent communication between the Blood Bank and the Fetal Assessment Unit (FAU). The foetal anaemia can be the result of maternal red cell alloantibodies causing haemolytic disease of the foetus and newborn (HDFN) or, more rarely, foetal anaemia due to parvovirus B19 infection. An IUT of platelets is also available when there is foetal alloimmune thrombocytopenia.

Following the request for the first IUT from the FAU the Irish Blood Transfusion Service (IBTS) will perform an extended phenotype on the most recent sample from the mother to include Fya, Fyb, Jka, S and s types and where time allows source donors to match the patients extended phenotype as far as possible.

Once an IUT date has been scheduled the patient must present to the FAU to have two 9 ml EDTA inpatient group and antibody (type and screen) samples collected. The timing of this sample collection must be discussed between the FAU and the Blood Bank. The samples are required for crossmatching and referral to the IBTS and must be collected no sooner than 72 hours prior to the transfusion event.

At the **FIRST IUT** it is important to always do a foetal Group and Coombs and a foetal FBC using a pre-transfusion sample.

Depending on the clinical picture other pre-transfusion samples may be taken for Cytogenetics, Parvovirus or a TORCH screen. It is the responsibility of the attending clinician to request these.

At subsequent IUTs, the only pre-transfusion foetal sample collected is an FBC.

The sample requirements for the above tests are as follows:

* Group and Coombs – 3ml EDTA
* FBC – 1.3ml EDTA
* Cytogenetics - 1.3 ml LiHeparin
* Parvovirus - 1.3 ml Serum
* Torch Screen - 1.3 ml Serum

At all IUTs, the Clinician will take numerous foetal 1.3ml EDTA FBC samples for the estimation of foetal haemoglobin using a point of care testing device. The results of this testing will guide the required transfusion volume.

A Kleihauer test on the mother may be required on post transfusion samples after multiple IUT’s.

In the case of first time platelet IUTs for foetal alloimmune thrombocytopenia, a sample may also need to be further referred to the IBTS HLA laboratory for platelet genotype as per the Consultant Haematologist.

# Haemovigilance

Definition: “A set of organised surveillance procedures relating to serious adverse or unexpected events or reactions in donors or recipients and the epidemiological follow-up of donors (EC Directive 2002/98/EC)”

At hospital level the main objectives of the Haemovigilance system are:

* To ensure the safety of the transfusion system.
* Educate staff in best transfusion practice.
* Show that problems are recognized and effectively managed.
* Ensure compliance with legal requirements,
* Improve public confidence in the safety of blood and blood components

Misidentification at blood sampling may lead to fatal ABO-incompatible blood transfusion, especially if the patient has not previously had their blood group documented in the laboratory system. The error will not be picked up.

**Great care must be taken to ensure that the patient record open in MNCMS is that of the patient requiring the sample collection, especially noting that there may be 2 patients with the same Name and DOB,**

The Unique patient Hospital number (MRN) on the **patient identification band must be checked against the MRN on the banner bar of the record open for all inpatient sampling.**

For outpatient blood sampling clinical staff must ensure that positive identification of the patient has been undertaken prior to sampling. **Again ensure that the record open in MNCMS is that of the out- patient requiring the blood sample collection. Noting that there may be 2 patients with the same Name and DOB,**

Inadequately or mislabelled samples carry a significantly increased risk of containing blood from the wrong patient. Risk of misidentification may be reduced by staff adhering to the following principals: see 1 to 10 below.

1. Patients must be positively identified (see procedure below15.1-15.2) and their details must match those on the request form for all sampling. (Manual or electronic form)
2. All inpatients must wear an identity band
3. In the event of an ID band being removed from a patient, it is the responsibility of the clinician (nurse/midwife/doctor) removing the ID band to replace it.
4. **Collection of the sample and labelling of the sample tubes must be performed as one uninterrupted process involving one member of staff and one patient at the patient bedside**
5. **Sample labels must not be printed away from the patient bedside when using the MNCMS system for sample collection/labelling**
6. Sample tubes must never be pre-labelled.

**7**. If MNCMS is down or not available. The sample tube label must be handwritten with the minimum patient identifiers by the sample collector (identifiers exactly matching those on the identity band worn by the patient) at the patient bedside. The date and time of sampling and the identity of person taking the sample must also be recorded on the sample tube.The request form must have identical identifiers. **See Specimen Labelling in the event of MN-CMS printer failure**

1. Labels printed away from the patient (e.g. addressograph labels) must not be used on the transfusion sample but printed addressograph labels are acceptable on the manual request form only if available
2. All handwritten details must be legible.
3. For samples ordered and collected using the MNCMS.

Follow procedures outlined in this document, see section 4.3 Specimen

Collection MN-CMS.  **Verification of the match between the patient and the computer record and printing of the sample label must be performed at the bedside at the time of phlebotomy;** Samples must be labelled at the bedside using the correct printed label after PPID. (FBC label on FBC sample tube)

1. Prior to taking a blood specimen from a patient the following actions should be undertaken

* Inform patient of reason for collection of specimen, and any follow up/results of same
* Observe hospital consent policy.
* Observe hospital phlebotomy *(preparation of patient*), and health and safety guidelines
* The blood sample should not be obtained from an arm being used for the infusion of intravenous fluids because these may alter the blood specimen and invalidate the crossmatch.
* Observe Infection Control procedures
* Give the patient any relevant printed information leaflets and record this in patients medical chart *(e.g. Rhesus Negative leaflet, Blood Transfusion Information leaflet)*
* BCSH guidelines recommend that laboratories have a ‘zero tolerance’ policy for rejecting samples that do not meet the above minimum requirements.

## Patient Identification

A patient identification band must be worn by all in patients at time of sampling and receiving a blood transfusion. The patient is instructed not to remove the identification band because it is also required for pre-transfusion bedside checking. To ensure accuracy and legibility, the ID band should be printed, from the hospital’s computerised patient administration system. The minimum identifiers on the Identification Band are:

1. Last name
2. First name or Baby (also if applicable include Twin 1, Twin 2)
3. Date of birth
4. Unique patient Hospital number

## Positive Patient Identification Procedure

Wherever possible, patients for blood sampling or transfusion should be asked to

* State their full name and date of birth and this must exactly match the information on the identification band worn by the patient. Check spellings are correct.
* Patients who cannot confirm their identity are at particular risk.
* Great care must be taken in identifying neonates (twins/triplets) and unconscious or anaesthetized patients who cannot aid in the identification process. Identification discrepancies at any stage of the transfusion process must be investigated and resolved before moving to the next stage.
* If not using MNCMS all In-patient samples MUST be hand labelled from patient identification armband after performing PPI at the bedside for Blood transfusion Dept. *(e.g. Crossmatch Sample, Group* *and Antibodies*) applicable to Obstetric, Neonatal and Gynae patients or labelled with printed labels from MNCMS if available after performing PPI and scanning the patient barcoded ID Band at the patient bedside.
* Please note in all cases when using printed labels from MNCMS

**Verification of the match between the patient and the computer record and printing of the sample label must be performed at the bedside at the time of phlebotomy; Is this the RIGHT PATIENT? This verification is applicable to Inpatient and Outpatient settings**

* If not using MNCMS before sending a sample to laboratory check that the identifiers on patient identification armband, sample tube and manual form or printed order form from MNCMS are identical. Great care must be taken when recording DOB and Hospital number to avoid transcription errors which will lead to rejection of sample and a repeat been requested.
* See PP-CS-HV-16 for blood transfusion sample phlebotomy in Covid 19 patient clinical areas
* Complete all sections of request form. (Include gestation, reason for request, previous doses of anti-D, Date and Time of sensitizing event, surgical procedure, etc)

## General Haemovigilance Issues

### Traceability (Legal Requirement)

A traceability tag is attached to each blood component (red cells, plasma and platelets) issued. **The administrator of the product must sign the bottom half of the tag with date and time and return the tag to the Blood Transfusion department**. In cases where the emergency Group O Negative uncrossmatched blood is used complete Patient identifiers on traceability label. Traceability of all blood is a mandatory requirement and failure to comply with the traceability system will result in a non-conformance being generated and investigated to close out. See separate Blood Transfusion Administration Guideline PP-CS-HV-7 for records required in patient chart.

### Notification of Serious Adverse Events and Reactions (SAR and SAE)

Any serious adverse events (accidents and errors) related to the collection, testing, processing, storage and distribution of blood and blood components which may have an influence on their quality and safety, as well as any serious adverse reactions observed during or after transfusion which may be attributed to the quality and the safety of blood and blood components must be notified to the competent authority. See - Mandatory Reporting of SAR/ SAE/IBCT/ Non Mandatory in PP-CS-HV-5, and Blood Transfusion Administration GuidelinePP-CS-HV-7 available in Q Pulse.

### Following Suspected Transfusion Reaction

In cases of suspected transfusion reaction retain and send all used blood packs *(in that transfusion episode*) with administration set attached, sealed with a sterile cap to prevent spillage in a sealed bag to the blood transfusion laboratory with the necessary samples and suspected transfusion reaction report form completed by Doctor reviewing the patient at time of reaction.Suspected Transfusion Reaction can be ordered in MN-CMS as Adult or Infant Care set as applicable.(Two copies of the NMH Transfusion Reaction Form should be printed from MN-CMS and sent to the laboratory. In the event MN-CMS is down a hardcopy is available on Q-Pulse RF-CS-HV-1 Suspected Transfusion Reaction Form.) **All adverse reactions must be reported as per pertinent Haemovigilance policy.** Refer to Management and Investigation of Adverse Transfusion Reactions PP-CS- HV-2 available in Q Pulse

# 

# Haematology

## Haematology Tests

Correct filling of Sodium Citrate (Coagulation) tubes is essential.

See figure 13 for routine cut off times. Urgent samples will be processed ASAP as per LP-GEN-SPECREC.

Figure 29: Routine Haematology Tests

| **Test/Profile** | **Adult: Cap**  **Additive (Vol)** | **Paediatric: Cap**  **Additive (Vol)** | **Frequency Of Testing\ Turnaround  Times** | **Special Requirements** | **Accreditation Status** |
| --- | --- | --- | --- | --- | --- |
| Full Blood Count | EDTA 3.0ml | EDTA 1.3ml | Same day | Clotted specimens cannot be processed. Send within 24 hours of phlebotomy | Accredited |
| Manual Differential | EDTA 3.0ml | EDTA 1.3ml | Mon – Fri only: Same day if received before 1pm.Saturday before 11 am. | Clotted specimens cannot be processed | Accredited |
| Coagulation | Sodium Citrate 3.0ml | Sodium Citrate 1.3ml | Same day | Send within 4hrs. Correct volume essential  Relevant clinical details must be provided.  **Paeds with HCT >0.60 require citrate adjusted specimen tube (contact Haematology Lab).** | Accredited |
| D-dimer | Sodium Citrate 3.0ml | Sodium Citrate 1.3ml | Same day | Send immediately Correct volume essential. D Dimers on antenatal women available on consultant request only. | Accredited |
| Kleihauer | EDTA 3.0ml |  | Mon – Fri only: Same Day if received before 1pm. | **NB:** All specimens for Kleihauer testing must be hand written unless ordered via MN-CMS  Only Patients >20 weeks gestation  Relevant clinical details must be provided.  Kleihauer samples should be taken > 20 minutes post delivery | Accredited |
| Sickle Screen | EDTA 3.0ml |  | Same day |  | Accredited |
| Infectious Mononucleosis | EDTA 3.0ml |  | Same day | Can be requested by laboratory in response to WBC results | Accredited |
| Malaria | EDTA 3.0ml |  | 2 hrs for RDT  Mon – Fri only: Film review next day. | Blood films to be made less than 3 hours after the blood was drawn.  Blood films are referred to SJH or SVUH on the direction of the consultant microbiologist | Accredited |

**Notes:**

**Referral coagulation samples**

All referral coagulation samples out of hours must be ordered on a clinician to clinician basis. When this is confirmed, the medical scientist on call must contact the medical scientist in the referral lab to inform them the samples are on the way. The samples must reach the destination lab with 4 hours of phlebotomy.

**Platelet counts and Covid Vaccinations**

Ref: EXT-CS-HAE-175

Recently there has been specific concern around people post vaccination where they may have a platelet consuming condition which may lead to clots which may be fatal. Therefore particular attention needs to be paid to low platelet counts. It should be noted that pregnant women in the 1st and 3rd trimesters are not generally being vaccinated.

**Haematology Report Comment for Fibrinogen**

Please refer to the current literature for trimester specific ranges

Please note the difference in Fibrinogen levels in pregnant vs. non-pregnant patients

(1.5 – 4.0 g/l – Non-Pregnant

4.0 – 6.5 g/l – Pregnant)

## Stability of Routine Haematology Tests

The following tests need to be processed within the stated timeframes.

Figure 30: Stability of Routine Haematology Samples

|  |  |
| --- | --- |
| **Test / Profile** | **Sample Stability** |
| FBC | Within 24 hours of phlebotomy |
| Coagulation Samples | within 4 hours of phlebotomy |
| Kleihauer Requests | within 48 hours of phlebotomy |
| Sickle Screen | Within 48 hours of phlebotomy |
| Infectious Mononucleosis | within 48 hours of phlebotomy |
| Malaria Screen | within 3 hours of phlebotomy |

Figure 31: Additional Haematology Investigations

These are referred to external agencies. Turnaround times reflect specialist nature and referral laboratory response time.

| Test Investigation | **Test code** | **Container Type** | Turn around time | Referral Laboratory | Comment |
| --- | --- | --- | --- | --- | --- |
| Anaemia Screen**ADULT** – Includes Serum Iron, Serum Transferrin, TIBC (calculated), and % Iron Binding Saturation, B12 and Folate. (Ferritin only if required) | **ANE** | **1 x 4ml Lithium Heparin** | 2 days | St. Vincent’s Biochemistry | **Send on same day as received.**  If this is not possible:  The sample needs to be spun down and plasma removed from the cells.  A vial is labelled with the patients’ hospital number, patient’s name, D.O.B., small lab number sticker and today’s date. |
| Anti Cardiolipin Antibodies | **ACAV** | **1 x 7 ml plain** | 4 weeks | St. Vincent’s Immunology Laboratory | Assay includes IgG and IgM antibodies. |
| Anti-Cylic Citrinullated Protein Antibodies (CCP Antibodies) | **CCPV** | **1 x 7 ml plain** | 14 days | St. Vincent’s Immunology | CCP antibody appears to be more specific (approx 90%) for Rheumatoid Arthritis than rheumatoid factor. |
| ADAMTS13 | **ADAM** | Contact Consultant Haematologist for advice on ADAMTS13 Testing | Contact Consultan~~t~~ Haematologist for advice on ADAMTS13 Testing | Contact Consultan~~t~~ Haematologist for advice on ADAMTS13 Testing | Contact Consultan~~t~~ Haematologist for advice on ADAMTS13 Testing |
| Anti-dsDNA | **DDNA** | **1 x 7 ml plain** | 10 days | St. Vincent’s Immunology | Performed when ANA is positive with a titre of 1:800 or greater.  Strongly positive anti-dsDNA is suggestive of SLE. |
| Anti La Antibodies  (Part of an ENA Screen) | **ENAS** | **1 x 7 ml plain** | 30 days | St. Vincent’s Immunology | When booking in request add in Anti La Antibodies and all clinical details.  When ANA is positive 1:800 or greater, an anti-ENA screen is performed.  When positive, further tests for antibodies to individual antigens are performed. |
| Anti-Neutrophil Cytoplasmic Antibody | **ANCV** | **1 x 7 ml plain** | 14 days | St. Vincent’s Immunology | This test is available  on an urgent basis by arrangement with the laboratory. |
| Anti-Nuclear Antibodies | **ANAV** | **1 x 7 ml plain** | 7 days | St. Vincent’s Immunology | Samples are screened at 1/80 dilution. Staining pattern and titre are reported on positive samples. |
| Anti-Nuclear Antibody Screen | **AASS** | **1 x 7 ml plain** | 30 days | St. Vincent’s Immunology | When ANA is positive 1:800 or greater, an anti-ENA screen is performed.  When positive, sample is further tested for antibodies to the individual antigens. |
| Antiphospholipid Screen (includes Lupus Anticoagulant and Anti Cardiolipin Antibodies | **LASV**  **B2GP** | **2 x 3ml Sodium Citrate**  **1 x 7 ml plain** | 3-4 weeks  (Batched) | St. Vincent’s Coagulation Laboratory | SEND STRAIGHT AWAY  Beta2Glycoprotein  To Immunology St James’s |
| Anti Ro Antibodies  Part of an ENA Screen) | **ENAS** | **1 x 7 ml plain** | 30 days | St. Vincent’s Immunology | When booking in request add in Anti Ro Antibodies and all clinical details.  When ANA is positive 1:800 or greater, an anti-ENA screen is performed.  When positive, further tests for antibodies to individual antigens are performed. |
| Anti Thrombin | **ATSV** | **1 x 3ml Sodium Citrate** | 4-6 weeks | St. Vincent’s Coagulation Laboratory | SEND STRAIGHT AWAY  Tests done in batches unless requested urgently. |
| Anti Thrombin Three URGENT | **ATJ** | **1 x 3ml Sodium Citrate** |  | NCHCD  St. James’s, | SEND STRAIGHT AWAY  The Coagulation Lab NCHCD James’s Hospital must receive the samples by 4pm Mon-Fri. |
| Anti-Xa | **XAJ** | **2 x 3ml Sodium Citrate**  **1 x 2.7ml EDTA** | 2 Days | NCHCD  St James | SEND STRAIGHT AWAY  The Coagulation Lab NCHCD James’s Hospital must receive the samples by 4pm Mon-Fri. |
| APCR + FV Def. Plasma  (Activated Protein C Resistance + Factor V Leiden) | **APCJ** | **2 x 3ml Sodium Citrate** | 1 month | St. James’s (NCHCD) | SEND STRAIGHT AWAY  The Coagulation Lab NCHCD James’s Hospital must receive the samples by 4pm Mon-Fri. |
| Auto Antibody Screen  (Liver / Kidney investigation) | **AAS** | **1 x 7 ml plain** | 30 days | St. Vincent’s Immunology | Clinical details required.  When ANA is positive 1:800 or greater, an anti-ENA screen is performed.  When positive, sample is further tested for antibodies to the individual antigens. |
| BCR-ABL Mutation (p190/p210) | **BCR** | **2 x 2.7ml EDTA** | 14-21 days | St. James’s Cancer Molecular Diagnostics | Consultant Haematologist approval required.  Available Mon-Fri 9.30a.m. - 5.00p.m. |
| Beta 2 Glycoprotein | **B2GP** | **1 x 7 ml plain** | 7 days | St. James’s Immunology | Tests done in batches unless required urgently.  This test is always performed in conjunction Anti-Cardiolipin IgG antibodies. Anti-β2-Glycoprotein-1 antibodies are more specific for anti-phospholipid syndrome than Anti-Cardiolipin antibodies. |
| Blood Film Review **ADULT** | **MDH** | **Film is made using a glass slide and EDTA sample received.**  **A second film is made from the EDTA sample to retain in NMH** | 4 hours | St. Vincent’s Haematology | Blood films are made from FBC sample.  During the routine day or out of hours: Adult films are referred to St. Vincent’s Hospital at the request of a clinician/consultant or by a medical scientist for review and/or confirmation of blood film morphology.  Slides are stained as per PP-CS-HAE-20. They are packed into a slide holder and sent as per Section 2.4 Biomnis. |
| Blood Film Review **(PAED)** | **MDC** | **Glass slide - as above.**  **A second film is made from the EDTA sample to retain in NMH** |  | Children’s Health Ireland at Crumlin Haematology | As above. |
| Calreticulin mutation ( CALR) | **CALR** | **2 x 2.7ml EDTA** | 14-21 days | St. James’s Cancer Molecular Diagnostics | Consultant Haematologist approval required.  Available Mon-Fri 9.30a.m. - 5.00p.m. |
| Coeliac Screen | **COES** | **1 x 7 ml plain** | 14 days | St. Vincent’s Microbiology  (Specimen Reception) | Referred to Immunology Dept, St. James's Hospital.  Anti-tTG antibodies are strongly associated with Coeliac disease. An anti-EMA test will follow all positive tests. |
| Complement  (C3+C4) | **COMP** | **1 x 7 ml plain** | 3 days | St. Vincent’s Biochemistry |  |
| D-Dimers  **ADULT** | **DDIV** | **1 x 3ml Sodium CitrateADULT**  **2x Sodium Citrate 1.3ml(PAED)** | Performed Urgently | St. Vincent’s Coagulation | D Dimers on antenatal women only available on consultant request only  SEND STRAIGHT AWAY  Phone before sending  Can send Paediatric samples if required |
| D-Dimers  **(PAED)** | **DDIC** | **1 x Sodium Citrate 1.3ml** | Performed Urgently | Children’s Health Ireland at Crumlin Haematology | SEND STRAIGHT AWAY  Phone before sending  Paeds with HCT >0.60 require citrate adjusted specimen tube (contact Haematology Lab). |
| Erythropoeitin  (EpO) | **EPOJ** | **1 x 7 ml plain** | 1 week | St. James’s Nutrition | Fresh sample required.  Available during routine hours (Mon-Fri). **Urgent Analysis on Request**. |
| Erythrocyte sedimentation rate  Adult | **ESRV** | **1 x 2.7ml EDTA** | 24 hours | St Vincent’s Hospital |  |
| Erythrocyte sedimentation rate  Paediatric | **ESRT** | **1 x 2.7ml EDTA** | 3 hrs for samples received within routine hours. 24 hrs for samples outside of routine hours | Children’s Health Ireland at Temple St. |  |
| Factor Five Leiden  (Factor V Leiden mutation, Genetic tests for thrombophilia) | **FVLJ** | **2 x 3mlSodium Citrate**  **(for FVL)**  **1 x 2.7ml EDTA**  **(for aPC)** | 1 month | St. James’s (NCHCD) | SEND STRAIGHT AWAY  Samples must be received by Coag Lab, NCHCD by 4pm Mon-Fri.  Requests for Factor V Leiden must be accompanied by either samples for APCR analysis or an APCR result from an external source.  FV Leiden requests must be accompanied by request form EXT-CS-HAE-151 with box ticked to indicate patient consent received. |
| Factor Five Leiden  (Factor V Leiden mutation, Genetic tests for thrombophilia) | **FVLC** | **1 x Sodium Citrate 1.3ml** | 2 weeks | Children’s Health Ireland at Crumlin Haematology | Factor V Leiden is not indicated at birth ; consult Consultant Haematologist  SEND STRAIGHT AWAY  IF REQUIRED |
| Factor 5 **ADULT** | **FVJ** | **x 3ml Sodium Citrate** | 6 hours | St. James’s (NCHCD) | SEND STRAIGHT  AWAY |
| Factor 5 **( PAED)** | **Contact Haematology lab** | **1 x Sodium Citrate 1.3ml** | 2 weeks | Children’s Health Ireland at Crumlin Haematology | SEND STRAIGHT AWAY |
| Factor 8 **ADULT** | **F8J** | **2 x 3ml Sodium Citrate** | 6 hours | St. James’s (NCHCD) | SEND STRAIGHT  AWAY  (only send to SVUH under the instruction of the Consultant Haematologist F8V) |
| Factor 8 **(PAED)** | **F8C** | **1 x Sodium Citrate 1.3ml** | 2 weeks | Children’s Health Ireland at Crumlin Haematology | SEND STRAIGHT AWAY |
| Factor 9 **ADULT** | **F9J** | **2 x 3ml Sodium Citrate** | 6 hours | St. James’s (NCHCD) | SEND STRAIGHT AWAY  (only send to SVUH under the instruction of the Consultant Haematologist F9V) |
| Factor 9 **(PAED)** | **F9C** | **1 x Sodium Citrate 1.3ml** | 2 weeks | Children’s Health Ireland at Crumlin Haematology | SEND STRAIGHT AWAY |
| FBC **ADULT**  ( In event of analyser failure ) | **Contact Haematology lab** | **1 x 2.7ml EDTA** | Urgent : 4 hours  Routine: 24 Hours | St. Vincent’s Haematology |  |
| FBC **PAED**  ( In event of analyser failure ) | **Contact Haematology lab** | **1 x 1.3ml EDTA** | Urgent : 4 hours  Routine: 24 Hours | Children’s Health Ireland at Crumlin Haematology |  |
| Ferritin **ADULT** | See section 13 Biochemistry | | | | |
| Ferritin **(PAED)** | **FERC** | **1 x 7 ml plain** | 1 week | Children’s Health Ireland at Crumlin Haematology | **Send on same day as received.**  If this is not possible:  The sample needs to be spun down and plasma removed from the cells.  A vial is labelled with the patients’ hospital number, patient’s name, D.O.B., small lab number sticker and today’s date. |
| Flow (for Leukaemia) | **FLOV** | **3 x EDTA** |  | St. Vincent’s Haematology |  |
| Folate | **FOLV** | **1 x 4ml Heparin** | 2 days | St. Vincent’s Biochemistry |  |
| Glucose-6-phosphate dehydrogenase deficiency **ADULT** | **G6PD** | **2 x 2.7ml EDTA** | 2 days | St. James’s Haemolytic  Laboratory | Available during routine hours (Mon- Fri).  **All requests for G6PD should state if the patient is taking Sulfasalazine or a derivative.** |
| Glucose-6-phosphate dehydrogenase deficiency **(PAED)** | **G6PC** | **1 x 1.3ml EDTA** | 2 – 3 weeks | Children’s Health Ireland at Crumlin Haematology | **All requests for G6PD should state if the patient is taking Sulfasalazine or a derivative.** |
| Haptoglobin  (Serum Hp) | **HAPT** | **1 x 7 ml plain** | 2 days | St. James’s Haemolytic Laboratory | Consult with a Haematologist before taking the sample for haptoglobin.  Available during routine hours (Mon-Fri).  AdultRange =  0.45 - 2.05 g/l  Children: Adult levels are not reached until 3 – 12 months.  Do not measure levels in children < 1 yr old. |
| Haemoglobin S Levels | **HBSL** | **1 x 2.7ml EDTA** | 1 week | St. James’s Haemolytic Laboratory | Samples referred to SJH.  Sample must be received before 12:00 with FBC result and 2 unstained slides. |
| Haemoglobinopathy Screen **ADULT** | **HBE** | **1 x 2.7ml EDTA** | 1 week | St. James’s Haemolytic Laboratory | Can be requested as a response to Red cell parameters and ferritin result by the laboratory  Requires Haematologist approval |
| Haemoglobinopathy Screen **(PAED)** | **PHBE** | **1 x 1.3ml EDTA** | 1 – 2 weeks | Children’s Health Ireland at Crumlin Haematology | Send most recent FBC report (if available ) with request |
| Heparin Induced Thrombocytopenia (HIT Screen) | **HIT** | **2 x 7 ml plain** | PF4 Anti-IgG Elisa = 3 working days.  Particle Gel (PaGIA) test = 1 working day.  Heparin Induced Platelet Aggregation (HIPA) test = 48 hours post receipt in referral laboratory. | St. James’s (NCHCD) | 1 Vial of patients Heparin to be included with samples.  The Coagulation Lab NCHCD James’s Hospital must receive the samples by 4pm Mon-Fri.  Routine hours Mon-Fri or out of hours only by authorisation by Coagulation Consultant.  Request form EXT-CS-HAE-152 must accompany all requests. |
| Hereditary Haemochromatosis Screen (HHT) | Referred via Specimen Reception | **1 x 5ml EDTA** | 4 Days | Biomnis | Consultant Haematologist approval required.  HHT requests require Patient Consent form and Request form ; requests referred via Specimen Reception Department. |
| HHT Genetic Testing (Hereditary Hemorrhagic Telangiectasia) | **HHT** | **2x 6ml EDTA or 4 x 3ml EDTA (>10mls EDTA samples required)** | 8 weeks | Molecular Genetic Service  DavidBrockBuilding  Western GeneralHospital  Crewe Road South  Edinburgh  EH42XU  Scotland  Tel: 0044 1315 371116 | Consultant Haematologist approval required. |
| Homocysteine **ADULT** | **HCYS** | **1 x 2.7ml EDTA** | 5 days | St. Vincent’s Biochemistry | **Please send full clinical details.**  The Homocysteine sample must be centrifuged and plasma removed from the cells. The plasma must be frozen in a 1.8ml appropriately labelled vial.  A vial is labelled with the patients’ hospital number, patient’s name, D.O.B., small lab number sticker and today’s date. This sample is sent frozen to the Biochemistry Lab in St Vincent’s once a week. |
| Hypercoagulation Screen | **HYPS** | **3 x 3ml Sodium Citrate** |  | St. James’s (NCHCD) | SEND STRAIGHT AWAY |
| IgA Endomysial Antibodies  ( Part of Coeliac Screen) | **EMA** | **1 x 7 ml plain** | 10 days | St. Vincent’s Immunology | Assay only performed if anti-tTG is positive. Anti-EMA antibodies are highly specific for Coeliac disease. |
| Intrinsic Factor *Screen*  **ADULT**  (Factor VIII, Factor IX, Factor XI, Factor XII, Factor 8, Factor 9, Factor 11, Factor 12) | **IFS** | **6 x 3ml Sodium Citrate** | 7 days | St. James’s (NCHCD) | SEND STRAIGHT AWAY  The Coagulation Lab NCHCD James’s Hospital must receive the samples by 4pm Mon-Fri.  Routine hours Mon-Fri or out of hours only by authorisation by Coagulation Consultant. |
| Intrinsic Factor *Screen*  **(PAED)**  (Factor VIII, Factor IX, Factor XI, Factor XII, Factor 8, Factor 9, Factor 11, Factor 12) | **IFSC** | **Minimum 7mls required in 1.3ml Sodium Citrate Containers** | 2 – 3 weeks | Children’s Health Ireland at Crumlin Haematology | SEND STRAIGHT AWAY  Clinical details required.  Samples are run in batches. Urgent analysis available on request by Consultant. |
| Intrinsic Factor *Antibody* | **IFAJ** | **1 x 7 ml plain**  **(Serum >14days post B12 injection)** | 7 days | St. James’s Haematology | Available during routine hours (Mon-Fri).  Urgent analysis available on request. |
| Iron Studies **ADULT**  includes Serum Iron, Serum Transferrin, TIBC (calculated), % Iron Binding Saturation | **FES** | **1 x 4ml Heparin** |  | St. Vincent’s Biochemistry | **Send on same day as received.**  If this is not possible centrifuge and remove serum from red cells.  A vial is labelled with the patients’ hospital number, patient’s name, D.O.B., small lab number sticker and today’s date. |
| Iron Studies **(PAED)** | **FESP** | **1 x 7 ml plain** |  | Children’s Health Ireland at Crumlin Haematology | **Send on same day as received.**  If this is not possible centrifuge and remove serum from red cells.  A vial is labelled with the patients’ hospital number, patient’s name, D.O.B., small lab number sticker and today’s date. |
| Jak 2 Mutation  (JAK V617F) | **JAK2** | **2 x 2.7ml EDTA** | 14-21 days | St. James’s Cancer Molecular Diagnostics | Consultant Haematologist approval required.  Available Mon-Fri 9.30a.m. - 5.00p.m. |
| Lupus Screen  (includes Lupus Anticoagulant and Anti Cardiolipin Antibodies)  And Beta 2 Glycoprotein | **LASV** | **2 x 3ml Sodium Citrate**  **1 x 7 ml plain**  **1 x 7 ml plain** | 3-4 weeks  (Batched) | St. Vincent’s Coagulation Laboratory  St James Immunology | SEND STRAIGHT AWAY  The screen must arrive into the lab before 3pm as it will not be processed in St Vincent’s if it arrives in the Coagulation lab after 4pm.  The beta 2 glycoprotein is sent to SJH |
| Lymphocyte Subsets **ADULT and PAED**  **If associated with immunodeficiency**  Lymphocyte Subsets Paed | **LS**  **LSP** | **1 x 2.7ml EDTA**  **1 x 1.3ml EDTA** | 2 days | St. James’s Immunology  Children’s Health Ireland at Crumlin Haematology | Fresh sample required (<24hrs).  Must be received before 2.30pm on Fridays. |
| Methyltetrahydrofolate Gene | **MTFG** | **2 x 2.7ml EDTA** |  | St. James’s (NCHCD) |  |
| Platelet Function Assay  (PFA-100) | **Contact Haematology Lab** | **2 x 3ml Sodium Citrate** | 1 day | St Vincent’s Coagulation Laboratory | Do not use POD  SEND STRAIGHT AWAY  Samples must arrive in Coagulation LaboratorySVUH before **2pm** Mon - Fri. |
| Protein C | **PTC** | **1 x 3ml Sodium Citrate** | Batched every 4-6 weeks  6 hours  (URGENT) | St. Vincent’s Coagulation Laboratory | SEND STRAIGHT AWAY  Tests done in batches unless requested urgently.  Tests done in batches as part of the Thrombophilia screen every 4 -6 weeks, unless requested urgently. |
| Protein S | **PS** | **1 x 3ml Sodium Citrate** |  | St. Vincent’s Coagulation Laboratory | SEND STRAIGHT AWAY |
| Prothrombin Mutation  (PTGA, G20210A, Genetic testing for thrombophilia) | **PMUT** | **1 x 2.7ml EDTA** | 1 month | St. James’s Special Coagulation Laboratory (NCHCD)  Rialto Gate | **Keep sample at room temperature** and send out with the next routine Biomnis collection.  Available during routine hours (Mon-Fri).  PMUT requests must be accompanied by request form EXT-CS-HAE-151 with box ticked to indicate patient consent received. |
| Pyruvate Kinase  (PK Screen) | **PKA** | **2 x 2.7ml EDTA** | 1 Week | KCH | Chris Lambert  Red Cell Centre ,  Dept. Haematology  King’s College Hospital  00442032993576  Sent from Specimen reception  Include a copy of FBC and Reticulocyte count and blood film interpretation (if applicable ) . |
| Red Cell Folate | **RCFJ** | **1 x 2.7 ml EDTA**  **1 x 7 ml plain** | 1-2 weeks | St. James’s Nutrition Laboratory | Fresh sample required.  Available during routine hours (Mon-Fri). |
| Rheumatoid Factor | **RFSV** | **1 x 7 ml plain** | 1 day | St. Vincent’s Immunology |  |
| Rheumatoid Investigation  (ENA Screen) | **ENAS** | **1 x 7 ml plain** | 1 day | St. Vincent’s Immunology |  |
| Spherocytosis **ADULT**  (Osmotic Fragility Test, EMA) | **EHS** | **1 x 2.7ml EDTA** | 2-4 Hours | St. James’s Haematology | Fresh EDTA anti-coagulated blood required (analysis must be within 24hours of collection). FBC and blood film required. |
| Hereditary Spherocytosis **(PAED)** | **HSSC** | **1 x 2.7ml EDTA** | Carried out daily | Children’s Health Ireland at Crumlin Haematology |  |
| Tissue Transglutaminase Antibody (Anti-tTG)  (included in a Coeliac Screen) | **COES** | **1 x 7 ml plain** | 14 days | St. Vincent’s Microbiology (Specimen Reception) | Referred to Immunology Dept, St. James's Hospital.  Anti-tTG antibodies are strongly associated with Coeliac disease. An anti-EMA test will follow all positive tests. |
| Thrombophilia Screen **ADULT**  includes Protein C, Protein S, Anti-thrombin, Activated Protein C Resistance, Fibrinogen, Lupus Screen,  Factor VIII,  Anti-Cardiolipin Antibodies, B2gGlycoprotein, Homocysteine, Prothrombin Mutation | **FBC**  **TPSL**  **ACAV**  **B2GP**  **HCYS**  **PMUT** | **1 x 2.7ml EDTA**  **5 x 3ml Sodium Citrate**  **1 x 7 ml plain**  **1 x 7 ml plain**  **1 x 2.7ml EDTA**  **1 x 2.7ml EDTA** | 4-6 weeks | St. Vincent’s Coagulation Laboratory | SEND STRAIGHT AWAY  5 Sodium Citrate Samples are sufficient for the TPSL.  The Thrombophilia screen must be sent straight away. The screen must arrive into the lab before 3pm as it will not be processed in St. Vincent’s if it arrives in the Coagulation lab after 4pm.  The Homocysteine (HCYS) sample must be centrifuged and plasma removed from the cells. The plasma must be frozen in a 1.8ml appropriately labelled vial. A vial is labelled with the patients’ hospital number, patients name, D.O.B., small lab number sticker and today’s date. This sample is sent frozen to the Biochemistry Lab in St. Vincent’s once a week.  The sample is placed into a frozen container provided by Biomnis. The relevant printed referral form and frozen container are then placed into a Styrofoam container and then into a card board box containing the UN3373 label. The boxes are located in Specimen Reception. The labels are stored in the referral folder in the Haematology Dept.  The Prothrombin mutation (PMUT) sample must stay at room temperature until it is sent to the NCHCD in St. James’s Hospital in the next routine Biomnis collection.  PMUT requests must be accompanied by request form EXT-CS-HAE-151 with box ticked to indicate patient consent received. |
| Thrombophilia Screen **(PAED)** | **TPSC** | **6 x Sodium Citrate 1.3ml**  **1 x 1.3ml EDTA** | 4 Weeks | Children’s Health Ireland at Crumlin Haematology | SEND STRAIGHT AWAY  Clinical details required. |
| Vitamin B12 | **B12V** | **1 x 4ml Heparin** | 2 Days | St. Vincent’s Biochemistry | Please state if patient is receiving exogenous Vitamin B12. |
| Von Willebrand *Factor*  **ADULT**  (Von Willebrand Ristocetin Co-Factor) | **VWF** | **4 x 3ml Sodium Citrate**  **1 x 2.7ml EDTA** | 1 week | St. James’s (NCHCD) | SEND STRAIGHT AWAY  The screen must arrive into the lab before 3pm as it will not be processed in St James if it arrives in the lab after 4pm.  Available during routine hours (Mon-Fri). |
| Von Willebrand Screen **ADULT (>18 years)**  (VWD Sreen, Bleeding Screen, VW Antigen, VW:Ag, VW Ristocetin Co-Factor, VW:RCo, VW Collagen Binding, VW:CB, VW Multimers) | **VWS** | **4 x 3ml Sodium Citrate**  **1 x 2.7ml EDTA** | 3 weeks (Including multimers 6 weeks) | St. James’s (NCHCD) | SEND STRAIGHT AWAY  The screen must arrive into the lab before 3pm as it will not be processed in St James if it arrives in the lab after 4pm.  Routine hours Mon-Fri or out of hours only by authorisation by Coagulation Consultant. |
| Von Willebrand Screen **(PAED) (<18 years)** | **VWSC** | **3 x 1.3ml Sodium Citrate** | 3 – 4 Weeks | Children’s Health Ireland at Crumlin Haematology | SEND STRAIGHT AWAY |

## ****Blood Films Outside of Routine Hours****

* Scientists ‘On-Call’ prepare films for review. They are trained to recognise platelet clumping. All other urgent film review ‘Out of Hours’ is referred to Consultant Haematologist.
* Paediatric Blood Films are referred to the Haematology service at Our Lady’s Hospital for Sick Children on a Consultant to Consultant request.
* Adult Blood Films are referred to the Haematology service at St. Vincent's University Hospital on Consultant to Consultant Request.

In both cases the requesting Consultant discusses the case with the Consultant Haematologist on-call, and the blood films are referred on request to the named Consultant.

## Haematology Reference Ranges

|  | **Full Blood Count Reference Ranges (WinPath)** | | | | |
| --- | --- | --- | --- | --- | --- |
| **Parameter** | **Units** | **M/F** | **Age** | **Range** | **Reference** |
| **Haemoglobin** | g/dl | F/M | D0 - D2 | 13.5 – 19.5 | GOSCH |
|  |  | F/M | D3 - D4 | 14.5 – 22.5 | GOSCH |
|  |  | F/M | D5 - D8 | 13.5 – 21.5 | GOSCH |
|  |  | F/M | D9 - D21 | 12.5 – 20.5 | GOSCH |
|  |  | F/M | D22 - D35 | 10.0 – 18.0 | GOSCH |
|  |  | F/M | D36 - D63 | 9.0 – 14.0 | GOSCH |
|  |  | F/M | D64 - 18M | 10.0 – 13.5 | GOSCH |
|  |  | F/M | 18M - 3Y | 10.5 – 13.5 | GOSCH |
|  |  | F/M | 3Y - 7Y | 11.5 – 14.5 | GOSCH |
|  |  | F/M | 7Y - 13Y | 11.5 – 15.5 | GOSCH |
|  |  | M | 14Y - 19Y | 13.0 – 16.0 | GOSCH |
|  |  | F | adult | 11.0 – 15.0 | BSH^ |
|  |  | M | adult | 13.0– 17.0 | SVUH |
|  |  |  |  |  |  |
| **RBC** | x10^12/l | F/M | D0 - D2 | 3.9 - 5.3 | GOSCH |
|  |  | F/M | D3 - D4 | 4.0 - 6.6 | GOSCH |
|  |  | F/M | D5 - D8 | 3.9 - 6.3 | GOSCH |
|  |  | F/M | D9 - D21 | 3.6 - 6.2 | GOSCH |
|  |  | F/M | D22 - D35 | 3.0 - 5.4 | GOSCH |
|  |  | F/M | D36 - D63 | 2.7 - 4.9 | GOSCH |
|  |  | F/M | D64 - D98 | 3.1 - 4.5 | GOSCH |
|  |  | F/M | D99 - 3Y | 3.7 - 5.3 | GOSCH |
|  |  | F/M | 3Y - 7Y | 3.9 - 5.3 | GOSCH |
|  |  | F/M | 7Y- 13Y | 4.0 - 5.2 | GOSCH |
|  |  | F/M | 13Y - 19Y | 4.1 - 5.1 | GOSCH |
|  |  | F | adult | 3.8 - 4.8 | SVUH |
|  |  | M | adult | 4.5 - 5.3 | SVUH |
|  |  |  |  |  |  |
| **Haematocrit** | L/L | F/M | D0 - D1 | 0.42 - 0.6 | GOSCH |
|  |  | F/M | D2 - D4 | 0.45 - 0.67 | GOSCH |
|  |  | F/M | D5 - D8 | 0.42 - 0.66 | GOSCH |
|  |  | F/M | D9 - D21 | 0.39 - 0.63 | GOSCH |
|  |  | F/M | D22 - D35 | 0.31 - 0.55 | GOSCH |
|  |  | F/M | D36 - D49 | 0.34 - 0.4 | GOSCH |
|  |  | F/M | D50 - D63 | 0.28 - 0.42 | GOSCH |
|  |  | F/M | D64 - D98 | 0.29 - 0.41 | GOSCH |
|  |  | F/M | D99 - 3Y | 0.33 - 0.39 | GOSCH |
|  |  | F/M | 3Y - 13Y | 0.35 - 0.45 | GOSCH |
|  |  | F | adult | 0.33 - 0.47 | BSH^ |
|  |  | M | adult | 0.4 - 0.5 | SVUH |
|  |  |  |  |  |  |
| **MCV** | fl | F/M | D0 - D2 | 98 - 118 | GOSCH |
|  |  | F/M | D3 - D4 | 95 - 121 | GOSCH |
|  |  | F/M | D5 - D8 | 88 - 126 | GOSCH |
|  |  | F/M | D9 - D21 | 86 - 124 | GOSCH |
|  |  | F/M | D22 - D35 | 85 - 123 | GOSCH |
|  |  | F/M | D36 - D63 | 77 - 115 | GOSCH |
|  |  | F/M | D64 - D98 | 74 - 118 | GOSCH |
|  |  | F/M | D99 - 3Y | 70 - 86 | GOSCH |
|  |  | F/M | 3Y - 7Y | 75 - 87 | GOSCH |
|  |  | F/M | 7Y - 13Y | 77 - 94 | GOSCH |
|  |  | F/M | 13Y - 19Y | 78 - 102 | GOSCH |
|  |  | F/M | adult | 80 - 100 | SVUH |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| **MCH** | pg | F/M | D0 - D4 | 31 - 37 | GOSCH |
|  |  | F/M | D5 - D35 | 28 - 40 | GOSCH |
|  |  | F/M | D36 - D63 | 26 - 34 | GOSCH |
|  |  | F/M | D64 - D98 | 25 - 35 | GOSCH |
|  |  | F/M | D99 - 3Y | 23 - 31 | GOSCH |
|  |  | F/M | 3Y - 7Y | 24 - 30 | GOSCH |
|  |  | F/M | 7Y - 13Y | 25 - 33 | GOSCH |
|  |  | F/M | 13Y - 19Y | 25 - 35 | GOSCH |
|  |  | F/M | 19Y - Adult | 26 - 34 | GOSCH |
|  |  | F/M | Y7 – Y12 | 25 - 33 | GOSCH |
|  |  | F/M | Y13 – Y18 | 25 - 35 | GOSCH |
|  |  | F/M | adult | 27 - 32 | SVUH |
|  |  |  |  |  |  |
| **MCHC** | g/dl | F/M | D0 – D1 | 30.0 – 33.0 | CHI@Crumlin |
|  |  | F/M | D2 – D13 | 29.0 – 34.0 | CHI@Crumlin |
|  |  | F/M | D14 – D56 | 28.0 – 35.0 | CHI@Crumlin |
|  |  | F/M | D56 – 2Y | 29.0 – 34.0 | CHI@Crumlin |
|  |  | F/M | 2Y – Adult | 30.0 – 33.0 | CHI@Crumlin |
|  |  | F/M | Adult | 30 – 35.5 | CHI@Crumlin |
| **RDW** | % | F/M | 0Y - Adult | 11.0 - 16.0 | GOSCH |
|  |  |  |  |  |  |
| **WHITE CELLS** | x10^9/l. | F/M | D0 - D7 | 10 - 26 | GOSCH |
|  |  | F/M | D7 - 1Y | 6 - 18 | GOSCH |
|  |  | F/M | 1Y - 8Y | 5 - 15 | GOSCH |
|  |  | F/M | 8Y - 13Y | 4.5 - 13.5 | GOSCH |
|  |  | F | adult | 3.5 - 14.6 | Lower SVUH  Upper-Paper\* |
|  |  | M | adult | 3.5 - 11.0 | SVUH |
|  |  |  |  |  |  |
| **Neutrophils** | x10^9/L | F/M | 0Y - 2Y | 1.0 - 8.5 | GOSCH |
|  |  | F/M | 2Y - 6Y | 1.5 - 8.5 | GOSCH |
|  |  | F/M | 6Y - 12Y | 1.5 - 8.0 | GOSCH |
|  |  | F/M | 12Y - 16Y | 1.8 - 8.0 | GOSCH |
|  |  | F | adult | 2.0 - 11 | Lower SVUH  Upper-Paper\* |
|  |  | M | adult | 2.0 - 8.0 | SVUH |
|  |  |  |  |  |  |
| **Lymphocytes** | x10^9/L | F/M | Y0 - Y2 | 3.0 - 13.5 | GOSCH |
|  |  | F/M | Y2 - Y6 | 2.0 - 9.5 | GOSCH |
|  |  | F/M | Y6 - Y12 | 1.5 - 7.0 | GOSCH |
|  |  | F/M | Y12 - Y16 | 1.2 - 5.2 | GOSCH |
|  |  | F/M | adult | 1.0 - 4.0 | SVUH |
|  |  |  |  |  |  |
| **Monocytes** | x10^9/l. | F/M | 0Y - 6Y | 0.3 - 1.5 | GOSCH |
|  |  | F/M | 6Y - 16Y | 0.1 - 0.8 | GOSCH |
|  |  | F/M | adult | 0.2 - 1.0 | SVUH |
|  |  |  |  |  |  |
| **Eosinophils** | x10^9/l. | F/M | 0Y - 2Y | 0.1 - 0.3 | GOSCH |
|  |  | F/M | 2Y - 6Y | 0.3 - 0.8 | GOSCH |
|  |  | F/M | 6Y - 16Y | 0.1 - 0.8 | GOSCH |
|  |  | F/M | adult | 0 - 0.5 | SVUH |
|  |  |  |  |  |  |
| **Basophils** | x10^9/l. | F/M | 0Y - 16Y | 0 - 0.2 | GOSCH |
|  |  | F/M | adult | 0 - 0.2 | SVUH |
|  |  |  |  |  |  |
| **Platelet Count** | x10^9/l. | F/M | 0Y - Adult | 150 - 450 | GOSCH |
|  |  | F/M | Adult | 150 - 400 | SVUH |
|  |  |  |  |  |  |
| **Reticulocyte Count** | x10^9/l. | F/M | OD – 1 D | 110 - 450 | CHI@Crumlin |
|  |  | F/M | 2D – 7D | 18 - 80 | CHI@Crumlin |
|  |  | F/M | 8D – 30D | 10 - 65 | CHI@Crumlin |
|  |  | F/M | 31D – 60D | 35 – 200 | CHI@Crumlin |
|  |  | F/M | 61D – 5M | 15 – 110 | CHI@Crumlin |
|  |  | F/M | 5M – 1Y | 30 – 130 | CHI@Crumlin |
|  |  | F/M | 1Y - Adult | 20 - 100 | CHI@Crumlin |
|  |  | F/M | adult | 16 - 80 | SVUH |
|  |  |  |  |  |  |

**References:**

^The displayed reference range for Hb and HCT is for pregnant patients and is taken from BSH Guidelines on the management of Iron deficiency in pregnancy.

\* The displayed reference ranges for upper limit for total and differential leukocyte counts percentiles are those for normal pregnancy as per paper by Samuel Lurie 2006 European Journal of Obstetrics and Gynaecology. The non pregnant upper range is provided in the tables below

SVUH – St Vincents University Hospital

CHI@Crumlin – Childrens Health Ireland at Crumlin

GOSCH – Great Ormand Street Children’s Hospital

|  |  |  |  |
| --- | --- | --- | --- |
| **Coagulation Reference Ranges (WinPath)** | | | |
| **Age** | **APTT (secs)** | **Prothrombin Time (secs)** | **Fibrinogen (g/L)** |
| D1 – D5 | 31.3 – 53.6 | 10.14 – 15.86 | 1.67 – 3.99 |
| D5 – D30 | 25.36 – 59.84 | 9.48 – 15.32 | 1.62 – 4.62 |
| D30 – D90 | 25.56 – 55.24 | 9.3 – 14.3 | 1.62 – 3.78 |
| D90 – D180 | 24.06 – 50.14 | 9.6 – 14.2 | 1.07 – 3.79 |
| D180 – 1Y | 28.08 – 42.92 | 10.72 – 13.86 | 1.15 – 3.87 |
| 1Y – 5Y | 24 - 36 | 10.6 – 11.4 | 1.70 – 4.05 |
| 6Y – 10Y | 26 - 36 | 10.1 – 12.1 | 1.57 – 4.0 |
| 11Y – 16Y | 26 – 37 | 10.2 – 12.0 | 1.54 – 4.48 |
| Adult | 23 - 32 | 9.6 - 12 | 4.0 – 6.5 |
| Adult Non pregnant |  |  | 1.5 – 4.0 |

**References:**

* **Paediatric:**



* **Adult pregnant and Non Pregnant Fibrinogen:**

Abbassi-Ghanavati M, Greer LG, Cunningham FG. Pregnancy and laboratory studies: a reference table for clinicians. Obstet Gynecol. 2009 Dec;114(6):1326-31. PMID:[19935037](http://www.ncbi.nlm.nih.gov/pubmed/19935037?)

* **Adult APTT range**:

NMH CS-2100 Validation, 2012

**Published ranges for Infants, Adults and Pregnant Females (trimester specific)**

**Haematological values for normal infants from birth - 6 months (Practical Haematology, Dacie and Lewis; 10th Edition)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Birth** | **Day 3** | **Day 7** | **Day 14** | **1 Month** | **2 Months** | **3-6 Months** |
| RBC (x1012/l)  **RBC** | **5 - 7** | **4 - 6.6** | **3.9 - 6.3** | **3.6 - 6.2** | **3.0 - 5.4** | **3.1 - 4.3** | **4.1 - 5.3** |
| **Hb (g/dl)** | **14 - 22** | **15 - 21** | **13.5 - 21.5** | **12.5 - 20.5** | **11.5 - 16.5** | **9.4 - 13** | **11.1 - 14.1** |
| **HCT (l/l)** | **0.45 - 0.75** | **0.45 - 0.67** | **0.42 - 0.66** | **0.31 - 0.71** | **0.33 - 0.53** | **0.28 - 0.42** | **0.30 - 0.40** |
| **MCV (fl)** | **100 - 120** | **92 - 118** | **88 - 126** | **86 - 124** | **92 - 116** | **87 - 103** | **68 - 84** |
| **MCH (pg)** | **31 - 37** | **31 - 37** | **31 - 37** | **31 - 37** | **30 - 36** | **30 - 36** | **24 - 30** |
| **MCHC (g/dl)** | **30 - 36** | **30 - 37** | **28 - 38** | **28 - 38** | **29 - 37** | **28.5 - 35.5** | **30 - 36** |
| **WBC (x109/l)** | **10 - 26** | **7 - 23** | **6 - 22** | **6 - 22** | **5 - 19** | **5 - 15** | **6 - 18** |
| **Neutrophils (x109/l)** | **4 - 14** | **3 - 5** | **3 - 6** | **3 - 7** | **3 - 9** | **1 - 5** | **1 - 6** |
| **Lymphocytes (x109/l)** | **3 - 8** | **2 - 8** | **3 - 9** | **3 - 9** | **3 - 16** | **4 - 10** | **4 - 12** |
| **Monocytes**  **(x109/l)** | **0.5 - 2.0** | **0.5 - 1.0** | **0.1 - 1.7** | **0.1 - 1.7** | **0.3 - 1.0** | **0.4 - 1.2** | **0.2 - 1.2** |
| **Eosinophils**  **(x109/l)** | **0.1 - 1.0** | **0.1 - 2.0** | **0.1 - 0.8** | **0.1 - 0.9** | **0.2 - 1.0** | **0.1 - 1.0** | **0.1 - 1.0** |
| **Basophils\***  **(x109/l)** | **0.02 - 0.12** | | | | | | |
| **Platelets**  **(x109/l)** | **100 - 450** | **210 - 500** | **160 - 500** | **170 - 500** | **200 - 500** | **210 - 650** | **200 - 550** |
| **Reticulocytes**  **(x109/l)** | **120 - 400** | **50 - 350** | **50 - 100** | **50 - 100** | **20 - 60** | **30 - 50** | **40 - 100** |
| **NRBCs\***  **(x109/l)** | **0 - 5.4** | **0 - 5.4** | **0 - 5.4** | **0 – 0.1** | **0 - 0.1** | **0.0** | **0.0** |

\*Basophil count reference range taken from *Blood Cells, A Practical Guide, Barbara J. Bain, 3rd Edition.* Range is from; 9 days- 1 year

*\*NRBC count reference range taken from GOSH, London*

**Haematological Values for Normal Adults (Practical Haematology 10th Edition)**

|  |  |  |
| --- | --- | --- |
| **Parameter** | **Female** | **Male** |
| RBC (x1012/l) | 3.8-4.8 | 4.5-5.5 |
| **Hb (g/dl)** | 12-15 | 13-17 |
| **HCT (l/l)** | 0.36-0.46 | 0.4-0.5 |
| **MCV (fl)** | 83-101 | 83-101 |
| **MCH (pg)** | 27-32 | 27-32 |
| **MCHC\* (g/dl)** | 31-37 | 31-37 |
| **RDW (CV %)** | 11.6-14 | 11.6-14 |
| **WBC (x109/l)** | 4-10 | 4-10 |
| **Neutrophils**  **(x109/l)** | 2-7 | 2-7 |
| **Lymphocytes**  **(x109/l)** | 1-3 | 1-3 |
| **Monocytes**  **(x109/l)** | 0.2-1.0 | 0.2-1.0 |
| **Eosinophils**  **(x109/l)** | 0.02-0.5 | 0.02-0.5 |
| **Basophils**  **(x109/l)** | 0.02-0.1 | 0.02-0.1 |
| **Platelets**  **(x109/l)** | 150-410 | 150-410 |
| **Reticulocytes**  **(x109/l)** | 50-100 | 50-100 |
| **Reticulocytes**  **(%)** | 0.5-2.5 | 0.5-2.5 |
| **NRBCs**  **(x109/l)** | **0.0** | **0.0** |

\*MCHC reference range taken from *Blood Principles and Practice of Haematology; Handin, R.I., Lux, S.E., Stossel T.P.* 1995.

**Haematological Values during Pregnancy (Blood Cells. A Practical Guide Barbara J. Bain; 3rd Edition)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **First Trimester** | **Second Trimester** | **Third Trimester\*** | **Trimester Not Stated** |
| RBC (x1012/l) | 3.52-4.52 | 3.20-4.41 | 3.10-4.44 | 3.10-4.52 |
| **Hb (g/dl)** | 11.0-14.3 | 10.0-13.7 | 9.8-13.7 | 9.8-14.3 |
| **HCT (l/l)** | 0.31-0.41 | 0.30-0.38 | 0.28-0.39 | 0.28-0.41 |
| **MCV (fl)** | 81-96 | 82-97 | 91-99 | 81-99 |
| **WBC (x109/l)** | 5.7-13.6 | 6.2-14.8 | 5.9-16.9 | 5.7-16.9 |
| **Neutrophils**  **(x109/l)** | 3.6-10.1 | 3.8-12.3 | 3.9-13.1 | 3.6-13.1 |
| **Lymphocytes**  **(x109/l)** | 1.1-3.5 | 0.9-3.9 | 1.0-3.6 | 0.9-3.9 |
| **Monocytes**  **(x109/l)** | 0.0-1.0 | 0.1-1.1 | 0.1-1.1 | 0.0-1.1 |
| **Eosinophils**  **(x109/l)** | 0.0-0.6 | 0.0-0.6 | 0.0-0.6 | 0.0-0.6 |
| **Basophils**  **(x109/l)** | 0.0-0.1 | 0.0-0.1 | 0.0-0.1 | 0.0-0.1 |
| **Platelets**  **(x109/l)** | 174-391 | 171-409 | 155-429 | 155-429 |
| **NRBCs**  **(x109/l)** | **0.0** | **0.0** | 0.0 | 0.0 |

\* Third trimester reference range is applicable for 6 weeks post delivery

## Haematology Critical Alert Ranges

Figure 31: Haematology Critical Values Management

The following results are to be phoned to the requesting clinician / teams soon as possible. For notes see next page

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Test** | **Lower Limit** | **Upper Limit** | **Who to phone:** | **Comments** |
| **Adult Coagulation:**  **Pregnant / Non Pregnant,**  Not on anticoagulant | **PT** | - | > 20 seconds | **Requesting Clinician (& Haematology team for INR>4)** | After all investigations carried out as per  WI-CS-HAE-50 |
| **APTT** | - | > 40 seconds | **Requesting Clinician**  **(& Haematology team for APTT>150sec)** | After all investigations carried out as per  WI-CS-HAE-50 |
| **Fibrinogen** | Pregnant  < 2.0 g/L  Non-Pregnant  <1.0 g/L | - | **Requesting Clinician**  **(& Haematology team if <0.5)** | After all investigations carried out as per  WI-CS-HAE-50 |
|  | **D-Dimer** | - | >4 ug/ml FEU | **Requesting Clinician** |  |
| **Adult:** | **Haemoglobin** | < 7.0 g/dl | > 17 g/dl | **Clinical area** |  |
| **Platelets** | < 80 x10^9/l | > 800 x10^9/l | **Requesting Clinician** | If platelet count suppressed due to platelet clumping ward should be informed of this. |
| **Neutrophils** | < 1 x10^9/l | - | **Requesting Clinician & Haematology team (During routine hours)** | - New onset.  If neutrophil count is < 1 after manual differential report to haematology team |
| **WCC** | < 3 x10^9/l | > 17 x10^9/l | **Clinical area** | - New onset.  - In the event of a substantial, clinically significant change in WCC of **rapid** onset -inform clinical team. |
| **Kleihauer** | - | > 4mls FMH | **Haematology team and Clinical area** |  |
| **Malaria** | - | - | **Clinical area and Consultant Microbiologist** | All Malaria requests are phoned to the consultant microbiologist |
| **Paediatric** | **PT** | - | > 20 seconds | **Requesting Clinician** | After all investigations carried out as per  WI-CS-HAE-50 |
| **APTT** | - | > 70 seconds | **Requesting Clinician** | After all investigations carried out as per  WI-CS-HAE-50 |
| **APTT** | - | >150seconds | **Paediatric registrar**&**Haematology team** | After all investigations carried out as per  WI-CS-HAE-50 (confirmed sample not taken from a heparinised line) |
| **Fibrinogen** | < 1 g/L | - | **Requesting Clinician**  **& (Haematology team if <0.5)** | After all investigations carried out as per  WI-CS-HAE-50 |
|  |  |  |  |  |
| **Haemoglobin** | < 9.0 g/dl | > 26 g/dl | **Requesting Clinician** |  |
| **Platelets** | < 80 x10^9/l | > 800 x10^9/l | **Requesting Clinician** |  |
| **Neutrophils** | < 1 x10^9/l | - | **Paediatric registrar** |  |

**Notes:**

* The haematology team is defined as Jacinta Byrne (CMS), Haematology registrar (contactable through St Vincent’s Switch), Dr Joan Fitzgerald (Consultant Haematologist) and the haematology Medical Rota contactable through St Vincent’s Switch
* Adult/Paediatric Unsuitable samples reported as UXCH are to be phoned to the clinical area if appropriate as per LP-GEN-TELREP
* Adult/Paediatric External Test Results are to be phoned to the clinical area if abnormal as per LP-GEN-TELREP. This is not necessary for Flow Cytometry results <4mls FMH.
* All Medical Scientists working in the Haematology laboratory including on call staff may telephone authorised results.
* Any other phoned results are left up to the discretion of the medical scientist

## Retrospective/ Add-On Requesting

Haematology and coagulation specimens are usually kept for one week at 2 – 6˚ C after processing. Blood films are kept for 1 month after review unless requested to be stored by the Chief/ Consultant Haematologist. Analyses of additional tests are subject to stability of analyte. All add-on requests require a requisition form and are entered in the laboratory information system.

Analyses of additional tests are subject to stability of analyte.

Appropriate additional tests can be added onto an FBC sample depending on sample volume and integrity.

Common Additional tests: Reticulocytes Within 24 hours

Blood film within 24 hours

Kleihauer Within 48 hours

Flow Cytometry (FMH) Within 7 days

# Microbiology

## Microbiology Specimens and Tests

Follow the instructions in section 2.2 above for labelling of specimen and form (paper or electronic).

* **Please note**: Samples for Blood Culture investigation **must be drawn first** to avoid contamination. See SI-NOT-GEN1and SI-NOT-GEN2 for Order of Draw charts on Q-Pulse.
* Blood cultures, C.S.F. samples and any sample requiring urgent testing whether during routine hours or on-call (as applicable) must be transported to the laboratory without delay.
* Routine specimens for culture must be stored at 4°C if there is any delay in transport to the laboratory (excludes blood cultures and CSF, keep at room temperature and transport to laboratory without delay).
* Inoculated agar plates from corneal scrapings, blood cultures, ocular fluid inoculated into paediatric blood culture bottle and inoculated chocolate agar plates for *N. gonorrhoeae* culture are processed immediately. Any remaining sample from ocular fluids (vitreous tap, AC tap, aqueous fluid) is then stored at 4°C. Other specimens transferred from RVEEH are stored at 4°C in NMH Microbiology Laboratory upon receipt until such time as they are processed.
* See also document PP-CS-MIC-64 available in Q-Pulse.

## Microbiology Specimen Stability

The majority of specimens for Microbiology are stable for up to 3 days once stored at 4°C.  Some exceptions apply for particular specimens and/or tests as follows

Figure 32: Stability of Microbiology Specimens

|  |  |
| --- | --- |
| **Test / Profile** | **Sample Stability** |
| Blood Cultures | Max 4 hours at Room Temperature |
| CSF | Send ASAP – store at Room Temperature |
| Inoculated Plates (Corneal scraping, gonorrhoeae) | Maximum of 24 hours – store at 4˚ C. |
| Urine for Chlamydia / Gonorrhoeae | Maximum of 24 hours – store at 4˚ C |
| Faeces - Norovirus | 3 days, store at 4˚ C |
| Faeces - Ova and Parasites | Send ASAP, store at 4˚ C. |
| Faeces - Rota / Adenovirus | 5 days, store at 4˚ C. |
| Faeces – Clostridium Difficile | 3 days, store at 4˚ C. |
| All other specimens | 3 days, store at 4˚ C. |

Figure 33: Blood Cultures

| **Blood Culture** | **Container** | **Volume** | **Turnaround  Times** | **Special**  **Requirements** | **Accreditation Status** | **Referred Test** |
| --- | --- | --- | --- | --- | --- | --- |
| Adult | Aerobic and  anaerobic vials | 8-10 mls  per bottle | Interim negative to date results at 24 and 48 hours for adults and 36 and 48 hrs for paeds.  Full negative results after 5 days.  Positive results available 48 - 96 hours from time bottle flagged positive.  TAT for blood cultures, for reporting of Gram stain from time of positivity (when bottle flags positive in BacT Alert) is <=4 hours | Specimens should be taken before commencement of antimicrobial therapy. Send to laboratory immediately. | Accredited | No |
| Neonate | Paeds vial | ≥ 1 ml | Accredited | No |

Figure 34: CSF Microbiology Examination

| **CSF** | **Container** | **Turnaround  Times** | **Special Requirements** | **Accreditation Status** | **Referred Test** |
| --- | --- | --- | --- | --- | --- |
| Culture | 3 X Sterile CSF tubes | Minimum: ≤48hrs.  Maximum: 96 hrs. | Specimens should be taken before commencement of antimicrobial therapy. Send to laboratory immediately.  PCR only performed under certain criteria as laid down by IMSRL | Accredited | No |
| Microscopy, Gram | ≤2hrs | Accredited |
| GBS, *E. coli* and *Listeria* sp. PCR | 1 day | Accredited | **Yes:** IMSRL |
| Viral studies | ≤1 week | Accredited | **Yes:** NVRL |

Figure 35: Faeces Examination

| **Faeces** | **Container** | **Specimen Volume** | **Turnaround  Times** | **Special Requirements** | **Accreditation Status** | **Referred**  **Test** |
| --- | --- | --- | --- | --- | --- | --- |
| Culture and Sensitivity | Sterile container | Stool specimen  10 ml | Minimum: 2 days  Maximum: 5 days |  | Accredited | No |
| Rotavirus, Adenovirus | Minimum: 2 days  Maximum: 5 days | Tested on paediatric specimens only | Accredited | No |
| *\*Clostridium difficile*  Adults, and children ≥2yrs. | Minimum: 1 days  Maximum: 3 days | Diarrhoeal specimens. Clinical details essential. | Not Accredited | No |
| \*Norovirus | Minimum: 1 days  Maximum: 3 days | Diarrhoeal specimens | Not Accredited | No |
| Ova and Parasites | 1 - 9 days | Test is not indicated on neonates.  Clinical details essential | Accredited | **Yes:** Microbiology, St. Vincent’s Hospital |
| Bloody Stools | ≤2 weeks | Clinical details essential. Sent for VTEC isolation | Accredited | **Yes:**Public Health Lab, Cherry Orchard Hospital |
| Occult Blood | 9 hrs – 1 day |  | Accredited | **No** |

\*Please note there is no set run time for processing of specimens for *C. difficile* or Norovirus. They will be processed as soon as possible, depending on availability of analyser for testing.

Figure 36: Fluids for Microbiology Examination

| **Fluid from**  **Normally Sterile**  **Sites** | | **Container** | **Specimen Volume** | **Turnaround  Times** | **Special Requirements** | **Accreditation Status** | **Referred Test** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Fluid from any site processed in NMH | Culture and cell count | Sterile container | >5ml | Minimum: 48hrs  Maximum:  96hrs | Please indicate if any specific infection is suspected. Send specimen to laboratory as soon as possible. | Accredited | No | |
| Accredited | No | |
| Accredited | No | |
| Accredited | No | |
| T.B. | Culture, auramine phenol stain | 6 - 8 weeks |  | Accredited | **Yes:** Microbiology, St Vincent’s Hospital | |
| EBM | Culture | Min. 1ml | Minimum: 72hrs  Maximum:  96hrs |  | Accredited | No | |

Figure 37: Sputum Microbiology Examination

| **Sputum** | **Container** | **Specimen Volume** | **Turnaround  Times** | **Special Requirements** | **Accreditation Status** | **Referred**  **Test** |
| --- | --- | --- | --- | --- | --- | --- |
| Culture | Sterile container | Deep cough purulent specimen.  1 ml | Minimum: 48hrs  Maximum: 96hrs | Specimens should be taken before antimicrobial therapy started.  Saliva and perinasal secretions unsuitable | Accredited | No |
| Legionella | 1 ml | 1 week |  | Accredited | **Yes:** Microbiology, St Vincent’s Hospital |
| Auramine phenol Stain | Early morning specimen on 3 consecutive days | 1 week | Accredited |
| T.B Culture | 6 - 8 weeks | Accredited |
| Bloodstained Sputa | 1 ml | Routine Culture: 10 days.  TB: 6 - 8 weeks | Any bloodstained sputa are referred to SVUH for ZN stain, TB culture and routine culture if required | Accredited |

Figure 38: Routine Swabs Microbiology Examination

| **Swabs** | **Container** | **Turnaround  Times** | **Special Requirements** | **Accreditation Status** | **Referred**  **Test** |
| --- | --- | --- | --- | --- | --- |
| HVS: Microscopy | Amies transport swab (blue top) | Gram stain:  Minimum: 24 hours  Maximum: 96 hours |  | Accredited | No |
| All swabs (see RF-CS-MIC-40 for all swabs processed in NMH) | Vary depending on swab type, see individual procedures for reporting times | Accredited | No |
| *Neisseria gonorrhoeae* Culture | Amies transport swab (blue top) | Minimum: 48 hrs  Maximum: 96 hrs | Endocervical swab, send immediately to Microbiology and Contact Micro Laboratory. Available during routine hours only | Accredited | **No:** Culture  **Yes**: For susceptibility testing when isolated. Referred to Microbiology, SJH |
| Rapid GBS Screen (GeneXpert)–Combined HVS/Rectal | Red Copan collection devices (double swab) | Same day | As per guidelines and/or as per Consultant Microbiologist. | Not accredited | No |
| PCR test for Chlamydia, *N. gonorrhoeae, Trichomonas vaginalis, Mycoplasma genitalium* | Aptima swab | 7 - 10 Days | Mycoplasma testing is only available for patients attending Preterm Surveillance clinic | Accredited | **Yes:** NVRL |

**Rapid GBS Screen – Run Times**

* During routine hours:
  + Monday – Friday 10.00, 12.30, 16.30
  + Saturday 11.45

Note:

* Any samples received after the scheduled run time will **not** be processed until the next scheduled run.
* If specimens miss the 16.30, Monday - Friday run, they will not be processed until the next scheduled run the next day.
* We would advise that if a sample is being taken near the last run time (16.30, Monday - Friday) and is deemed too urgent to wait until the next day, please contact the Microbiology laboratory (ext. 3533) to inform them that urgent sample on way and if possible to hold the run for a few minutes.
* It is only possible to hold the run for a maximum of 10 minutes, if the sample(s) are not down within the allotted time, they will **not** be processed until the next scheduled run.
* Out of hours (including Bank Holidays):
  + Monday – Friday: No run out of hours
  + Saturday: 20.30
  + Sunday and Bank Holidays: 12.30, 20.30

Figure 39: Surveillance Screens

| **Screen** | **Container** | **Specimen** | **Turnaround  Times** | **Special Requirements** | **Accreditation Status** | **Referred Test** |
| --- | --- | --- | --- | --- | --- | --- |
| MRSA: Adults | Amies transport swabs (blue top) | Nasal, throat and perineal / groin, eye, ear | Minimum: 48hrs  Maximum: 120 hrs |  | Accredited | No |
| MRSA: Neonatal Screen | Nasal, Groin and Umbilical | All babies in the unit are screened every Monday. All new admissions and re-admissions to the unit should be screened on arrival. | Accredited | No |
| MRSA:  Occupational Health  Screen\* | Nasal |  | Accredited | No |
| Gentamicin Resistant Enterobacterales | Sterile container OR  Amies transport swab (blue top) | Stool or Rectal Swab | Minimum: 24hrs  Maximum: 72 hrs | All babies in the unit are screened every Tuesday.  Faecal matter required on swab. | Accredited | No |
| VRE  Adults/ Neonates | Minimum: 48hrs  Maximum: 120 hrs | All patient transfers or recent hospital admissions screened for VRE and CPE | Not accredited | No |
| CPE  Adults/ Neonates | Minimum: 24hrs  Maximum: 72 hrs | Not accredited | No |

**\*Note:** Occupational health screen results are not available to view on ward enquiry

Figure 40: Urines Microbiology Examination

| **Urine** | **Container** | **Specimen Volume** | **Turnaround  Times** | **Special Requirements** | **Accreditation Status** | **Referred Test** |
| --- | --- | --- | --- | --- | --- | --- |
| Adults: Culture and microscopy | Sterile MSU Jar | Mid stream urine, catheter  10 ml | Minimum:  24 hrs  Maximum:  96 hrs | Specimens should be taken before antimicrobial therapy initiated. Specimens should be ≤ 48 hours old upon receipt in lab. | Accredited | No |
| Paediatric: Culture and microscopy | CCU, bag  1 ml | Accredited | No |
| Microscopy |  | Same day | Accredited | No |
| Pregnancy Test | 1 ml early morning specimen | Same day | Early morning specimens preferred | Accredited | No |
| Auramine phenol | 60 ml | 1 week | Complete early morning specimens from 3 consecutive days | Accredited | **Yes:** Microbiology, St. Vincent’s Hospital |
| TB Culture | 6 - 8 weeks | Accredited |
| Chlamydia  *N. gonorrhoeae* PCR | 60 ml | 7 – 10 days | First void specimen | Accredited | **Yes:** NVRL |

Figure 41: Other Specimens Microbiology Examination

| **Specimen** | **Container** | **Specimen Volume** | **Turnaround  Times** | **Special Requirements** | **Accreditation Status** | **Referred Test** |
| --- | --- | --- | --- | --- | --- | --- |
| Abscess and Pus | Sterile container | > 1ml | Minimum: 48hrs  Maximum: 6 days | Send to lab as soon as possible for anaerobic culture | Accredited | No |
| I.U.C.D. | IUCD | **Routine C/S:**  Minimum: 48 hrs Maximum: 96 hrs  **Actinomyces**  Minimum: 14 days  Maximum: 16 days | Leave all material on IUCD | Accredited | No |
| GBS PCR | EDTA | >0.5ml | Verbal: 1 Day  Written: 2-3 Days | N/A | Accredited | **Yes:** IMMRL |
| \*Influenza A/B, RSV PCR | Copan universal transport medium | Ensure swab is present in the container | Same day | As per clinical guidelines | Not accredited | No |
| Sars-CoV-2 | Copan universal transport medium | Ensure swab is present in the container | 24-48 hours | As per clinical guidelines | Not accredited | No |

\*Please note there is no set run time for processing of specimens for Influenza A/B / RSV.

All specimens will be processed as soon as possible, depending on availability of analyser for testing.

**Sars-CoV-2**

* + - **Only** symptomatic patients and those for imminent surgery under general anaesthetic are processed urgently.
    - All other patients and staff are processed the same day or within 48 hours of receipt of the sample.

Figure 42 : Microbiology Referral Tests

| **Test** | **Code** | **Container Type / Sample requirements** | **Investigation required** | **TAT** | **Lab Series** | **Referral Centre** | **Specific Form Required and Location** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **16s rRNA Bacterial Gene Detection** | 16SR | Fluid from normally sterile site e.g. ocular fluid, CSF | PCR | 1 week | M | **Micropathology Ltd.,**  **University of Warwick Science Park,**  **Venture Centre,**  **Sir William Lyons Road,**  **Coventry, CV4 7EZ,**  **United Kingdom**  [**Tel: 0044**](Tel:0044) **247 632 3222** | Yes  Available through website:  [www.micropathology.com](http://www.micropathology.com) |
| **18s rRNA Fungal Gene Detection** | 18SR | Fluid from normally sterile site e.g. ocular fluid, CSF | PCR | 1 week | M |
| ***Acanthamoeba*** | ACAN | Dry corneal swab | PCR | 1 week | M |
| **Adenovirus DNA** | * ADVD | Ocular fluid | PCR | 1 week | M |
| **A.S.O. Titre** | * ASO | Serum 7 ml  Only send after approval by  Consultant Microbiologist | Titre |  | M | **Microbiology Laboratory, St. Vincent’s University Hospital, Dublin 4. Tel : 01 221 4470** | No |
| ***Aspergillus* DNA** | ASPD | EDTA, BAL, Sputum.  Only send after approval by  Consultant Microbiologist | PCR | 1 week | M | **Micropathology Ltd.,**  **University of Warwick Science Park,**  **Venture Centre,**  **Sir William Lyons Road,**  **Coventry, CV4 7EZ,**  **United Kingdom**  [**Tel: 0044**](Tel:0044) **247 632 3222** | Yes  Available through website:  [www.micropathology.com](http://www.micropathology.com) |
| **Atypical Pneumonia** | * ATYA | Respiratory type samples in sterile container | PCR | 5 days | D | **National Virus Reference Laboratory,**  **UCD,**  **Belfield,**  **Dublin 4.**  **Tel: 01 716 4401** | No |
| * **Bartonella DNA** | * BART | EDTA, tissue | PCR | 1 week | M | **Micropathology Ltd.,**  **University of Warwick Science Park,**  **Venture Centre,**  **Sir William Lyons Road,**  **Coventry, CV4 7EZ,**  **United Kingdom**  [**Tel: 0044**](Tel:0044) **247 632 3222** | Yes  Available through website:  [www.micropathology.com](http://www.micropathology.com) |
| * **Borrelia DNA** | * BORD | EDTA, serum, tissue | PCR | 1 week | M |
| ***Bordetella pertussis* PCR Screen** | BPPC | Perinasal swabs (from Micro Lab)  Serum sample for Serology. Also accept NPA, sputum & perinasal swab for PCR. | Serology more useful for ongoing symptoms and no vaccinations | 1 week | M | **Microbiology Dept,**  **Children’s Health Ireland (CHI),**  **Crumlin,**  **Dublin 8**  **Tel: 01 409 6424 / 6426** | No |
| ***Candida* species** | CANS | Pure subculture on Nutrient agar slope | Susceptibility and M.I.C. tests | 3 days | M | **Microbiology Laboratory, St. Vincent’s University Hospital, Dublin 4. Tel : 01 221 4470** | No |
| ***Candida* DNA** | CAND | Ocular fluid, CSF, EDTA  Only send after approval by  Consultant Microbiologist | PCR | 1 week | M | **Micropathology Ltd.,**  **University of Warwick Science Park,**  **Venture Centre,**  **Sir William Lyons Road,**  **Coventry, CV4 7EZ,**  **United Kingdom**  [**Tel: 0044**](Tel:0044) **247 632 3222** | Yes  Available through website:  [www.micropathology.com](http://www.micropathology.com) |
| **Carbapenamase Producing Enterobacterales** |  | Pure subculture on Nutrient agar slope | Confirmation of CPE Results | ≤15 working days | M | **Carbapenemase Producing Enterobacterales (CPE) Reference Laboratory, Department of Medical Microbiology**  **University Hospital Galway,**  **Galway** | Yes  Available through website:  [www.saolta.ie](http://www.saolta.ie) |
| **CMV DNA** | * CMVD | Ocular fluid | PCR | 1 week | M | **Micropathology Ltd.,**  **University of Warwick Science Park,**  **Venture Centre,**  **Sir William Lyons Road,**  **Coventry, CV4 7EZ,**  **United Kingdom**  [**Tel: 0044**](Tel:0044) **247 632 3222** | Yes  Available through website:  [www.micropathology.com](http://www.micropathology.com) |
| **COVID 19** | * NCOV | Red respiratory viral transport media | PCR | 48-72 hours | M | **National Virus Reference Laboratory,**  **UCD,**  **Belfield,**  **Dublin 4.**  **Tel: 01 716 4401** | No |
| **Routine culture and sensitivity** | SPRC | Bloodstained sputa only | Sputa | 4 days | M | **Microbiology Laboratory, St. Vincent’s University Hospital, Dublin 4. Tel : 01 221 4470** | No |
| ***Cryptococcus neoforams* DNA** | CRYD | CSF, EDTA  Only send after approval by  Consultant Microbiologist | PCR | 1 week | M | **Micropathology Ltd.,**  **University of Warwick Science Park,**  **Venture Centre,**  **Sir William Lyons Road,**  **Coventry, CV4 7EZ,**  **United Kingdom**  [**Tel: 0044**](Tel:0044) **247 632 3222** | Yes  Available through website:  [www.micropathology.com](http://www.micropathology.com) |
| **Cryptosporidium** | CRYP | Stools | Identification by Staining methods | 3 days | M | **Public Health Laboratory, Cherry Orchard Hospital, Ballyfermot, Dublin 10. Tel: 076 695 5175 /**  **076 695 5176**  **Fax : 01 623 1908** | No |
| **EB Virus (EBV) DNA** | * EBVD | Ocular fluid | PCR | 1 week | M | **Micropathology Ltd.,**  **University of Warwick Science Park,**  **Venture Centre,**  **Sir William Lyons Road,**  **Coventry, CV4 7EZ,**  **United Kingdom**  [**Tel: 0044**](Tel:0044) **247 632 3222** | Yes  Available through website:  [www.micropathology.com](http://www.micropathology.com) |
| ***E. coli* 0157 (Bloody stools or clinical H.U.S)** | E157 | Stools | Culture for 0157 | 4 days | M | **Public Health Laboratory, Cherry Orchard Hospital, Ballyfermot, Dublin 10. Tel: 076 695 5175 /**  **076 695 5176**  **Fax : 01 623 1908** | Yes  Copy saved on Q-drive – Microbiology – Referral Forms |
| ***E. coli* PCR** | ECOP | C.S.F .400 µL | P.C.R.  Urgent send ASAP within working day or refrigerate immediately if at the weekend. | Samples are run each day 11am Mon-Fri. Results in late p.m. | M | **Irish Meningococcal and Sepsis Reference Laboratory. The Children’s University Hospital,**  **Temple St. Dublin 1. Tel : 01 878 4875 /**  **01 878 4858** | Yes  www.cuh.ie – healthcare professionals – departments – laboratory – IMSRL request form.  Copy also saved on Q-drive – Microbiology – Referral Forms |
| **Epidemiological testing** |  | Pure subcultures on slopes | Isolates for confirmation of outbreak | As per HPA reference laboratory | M | **Reference Laboratories with Specialist Expertise in the Diagnoses and Characterisation of Particular Micro organisms. See www.hpa.org.uk for individual laboratory contact details.** | Yes  Through website:  [www.hpa.org.uk/SRMTests](http://www.hpa.org.uk/SRMTests) for various request forms |
| **Fungi** | FUNG | Scrapings, nail, lesions | Isolation and identification of fungi from clinical samples | ≤2 weeks | M | **Microbiology Laboratory, St. Vincent’s University Hospital, Dublin 4. Tel : 01 221 4470** | No |
| **Fungal isolate** | SJHF | Pure subcultures on SDA agar seal with parafilm | Identification and susceptibility testing | ≤2 weeks | M | **Microbiology**  **St. James’s Hospital Dublin 8 Ph. 01 416 4209** | No |
| **Fungal and non-Candida yeast isolate** | BRIF | Pure subcultures on SDA agar seal with parafilm | Identification and susceptibility testing | ≤2 weeks | M | **PHE Mycology Reference Laboratory**  **National Infection Services, PHE South West Laboratory**  **Science Quarter**  **Southmead Hospital**  **Bristol**  **BS10 5NB** | Yes |
| **G.B.S. PCR** | GBSP | C.S.F .400 µL  EDTA samples 1 ml | P.C.R.  Urgent send ASAP within working day or refrigerate immediately if at the weekend. | Samples are run each day 11am Mon-Fri. Results in late p.m. | M | **Irish Meningococcal and Sepsis Reference Laboratory. The Children’s University Hospital,**  **Temple St. Dublin 1. Tel : 01 878 4875 /**  **01 878 4858** | Yes  www.cuh.ie – healthcare professionals – departments – laboratory – IMSRL request form.  Copy also saved on Q-drive – Microbiology – Referral Forms |
| **Group A / B *Streptococci* DNA** | GABS | CSF, EDTA/citrated whole blood, tissue | PCR | 1 week | M | **Micropathology Ltd.,**  **University of Warwick Science Park,**  **Venture Centre,**  **Sir William Lyons Road,**  **Coventry, CV4 7EZ,**  **United Kingdom**  [**Tel: 0044**](Tel:0044) **247 632 3222** | Yes  Available through website:  [www.micropathology.com](http://www.micropathology.com) |
| **HSV DNA** | * HSVD | Ocular fluid, dry corneal swab | PCR | 1 week | M |
| **Influenzae surveillance and typing** |  | Red respiratory viral transport media | PCR | 1 month | M | **National Virus Reference Laboratory,**  **UCD,**  **Belfield,**  **Dublin 4.**  **Tel: 01 716 4401** | No  Use surveillance sticker on form |
| **Invasive isolates of Anaerobes for susceptibility testing.** |  | Pure subculture on blood agar plate. | Susceptibility testing | 10 working days | M | **Microbiology Laboratory, St. Vincent’s University Hospital, Dublin 4. Tel : 01 221 4470** | No |
| **Invasive Isolates Of *Haemophilus influenzae*** |  | Pure subculture onto choc agar slope. | Serotyping | 10 working days | M | **Irish Meningococcal and Sepsis Reference Laboratory. The Children’s University Hospital,**  **Temple St. Dublin 1. Tel : 01 878 4875 /**  **01 878 4858** | Yes  www.cuh.ie – healthcare professionals – departments – laboratory – IMSRL request form.  Copy also saved on Q-drive – Microbiology – Referral Forms |
| **Invasive isolates of *Streptococcus pneumoniae*** |  | Pure subculture on Chocolate agar slopes | Serotyping | 7 working days | M | **Epidemiology and Molecular Biology Unit,**  **The Children’s University Hospital,**  **Temple St. Dublin 1. Tel : 01 878 4875 /**  **01 878 4858** | No |
| **Legionella Antigen** | LGAG | Urine | Immunochromatography | 2 working days | M | **Microbiology Laboratory, St. Vincent’s University Hospital, Dublin 4. Tel : 01 221 4470** | No |
| ***Listeria* species** |  | Pure subculture on nutrient agar slope. | Typing | 1-2 weeks | M | **NSSLRL, Medical Microbiology Dept, U.C.H, Galway. Tel : 091 221 4470** | Yes  Through website:  <http://www.nuigalway.ie/salmonella_lab> |
| ***Listeria monocytogenes* DNA** | LIMD | CSF, EDTA | PCR | 1 week | M | **Micropathology Ltd.,**  **University of Warwick Science Park,**  **Venture Centre,**  **Sir William Lyons Road,**  **Coventry, CV4 7EZ,**  **United Kingdom**  [**Tel: 0044**](Tel:0044) **247 632 3222** | Yes  Available through website:  [www.micropathology.com](http://www.micropathology.com) |
| **Meningococcal PCR** | MENP | CSF - 400µl  EDTA – 1ml | Collect specimen as close to time of onset and prior to antibiotic administration  Urgent send ASAP within working day, store at 4˚C if delay in transporting | 1 week | M | **Irish Meningococcal and Sepsis Reference Laboratory. The Children’s University Hospital,**  **Temple St. Dublin 1. Tel : 01 878 4875 /**  **01 878 4858** | Yes  www.cuh.ie – healthcare professionals – departments – laboratory – IMSRL request form.  Copy also in Micro folder on Q-drive. |
| **MRSA Isolates** | MRST | Pure subculture on nutrient agar slope. | Typing and confirmation of Meticillin resistance | 2 weeks | M | **National MRSA Reference Laboratory. St. James’s Hospital St. James’s Street Dublin 8 Tel: 01 410 3662 / 3 /4 Fax. 01 410 3666 Email:** [**mrsrl@stjames.ie**](mailto:mrsrl@stjames.ie) | Yes  Through website:  <http://www.stjames.ie/nmrsarl/index.html> |
| ***Mycoplasma pneumonia* Antibody** | MPAB | Serum sample | Serology | 3 working days | D | **Biomnis Ireland, Three Rock Road, Sandyford Industrial Estate, Dublin 18, D18 A4C0, Ireland**  **Tel: 01 295 8545 Fax: 01 295 8550** | No |
| ***Neisseria* species** |  | Pure subculture on chocolate agar. | Susceptibility testing | 1 week | M | **Microbiology**  **St. James’s Hospital Dublin 8 Ph. 01 416 4209** | No |
| ***Neisseria meningitidis*** |  | Pure subculture on chocolate agar | P.C.R. | Samples are run each day 11am Mon-Fri. Results in late p.m. | M | **Irish Meningococcal and Sepsis Reference Laboratory. The Children’s University Hospital,**  **Temple St. Dublin 1. Tel : 01 878 4875 /**  **01 878 4858** | Yes  www.cuh.ie – healthcare professionals – departments – laboratory – IMSRL request form.  Copy also in Micro folder on Q-drive. |
| **Ova and parasites** | OAP | Stools | Test for ova and parasites | 1 week | M | **Microbiology Laboratory, St. Vincent’s University Hospital, Dublin 4. Tel : 01 221 4470** | No |
| **Pleural Fluids** | Culture / Sens | Fluid in sterile jar | Culture and Sensitivity | ≤ 2 weeks | M |
| **Pneumococcal PCR** | PNEP | C.S.F or EDTA | P.C.R. | Samples are run each day 11am Mon-Fri. Results in late p.m. | M | **Irish Meningococcal and Sepsis Reference Laboratory. The Children’s University Hospital,**  **Temple St. Dublin 1. Tel : 01 878 4875 /**  **01 878 4858** | Yes  www.cuh.ie – healthcare professionals – departments – laboratory – IMSRL request form.  Copy also in Micro folder on Q-drive. |
| **Pneumoncoccal Antigen** | PNEU | Urine | Immunochromatography | 2 working days | M | **Microbiology Laboratory, St. Vincent’s University Hospital, Dublin 4. Tel : 01 221 4470** | No |
| ***Propionibacterium* DNA** | PROD | Ocular fluid | PCR | 1 week | M | **Micropathology Ltd.,**  **University of Warwick Science Park,**  **Venture Centre,**  **Sir William Lyons Road,**  **Coventry, CV4 7EZ,**  **United Kingdom**  [**Tel: 0044**](Tel:0044) **247 632 3222** | Yes  Available through website:  [www.micropathology.com](http://www.micropathology.com) |
| ***Pseudomonas* DNA** | PSAD | Ocular fluid | PCR | 1 week | M |
| **Rubella DNA** | RUBD | Ocular fluid | PCR | 1 week | M |
| ***Salmonella* species** |  | Pure subculture on nutrient agar slope. | Serotyping and identification | 1 week | M | **NSSLRL, Medical Microbiology Dept, U.C.H, Galway. Tel : 091 221 4470** | Yes  Through website:  <http://www.nuigalway.ie/salmonella_lab> |
| ***Shigella* species** |  | Pure subculture on nutrient agar slope. | Typing | 1-2 weeks | M |
| ***Staphylococcus* DNA** | STGD | Ocular fluid | PCR | 1 week | M | **Micropathology Ltd.,**  **University of Warwick Science Park,**  **Venture Centre,**  **Sir William Lyons Road,**  **Coventry, CV4 7EZ,**  **United Kingdom**  [**Tel: 0044**](Tel:0044) **247 632 3222** | Yes  Available through website:  [www.micropathology.com](http://www.micropathology.com) |
| ***Streptococcus pneumoniae* DNA** | SPND | Ocular fluid | PCR | 1 week | M |
| **T.B.** | TB | Sputa, tissue samples (all neck nodes) and urine | Z.N. or auromine-phenol stain and culture | Microscopy in 4 days. Culture in 6-8 weeks. | M | **Microbiology Laboratory, St. Vincent’s University Hospital, Dublin 4. Tel : 01 221 4470** | No |
| **TB DNA** | TBD | Ocular fluid | PCR | 1 week | M | **Micropathology Ltd.,**  **University of Warwick Science Park,**  **Venture Centre,**  **Sir William Lyons Road,**  **Coventry, CV4 7EZ,**  **United Kingdom**  [**Tel: 0044**](Tel:0044) **247 632 3222** | Yes  Available through website:  [www.micropathology.com](http://www.micropathology.com) |
| **Toxocariasis Serology** | TOXC | Ocular fluid | PCR | 1 Week | M | **PHE National Parasitology Reference Laboratory,**  **Hospital for Tropical Diseases,**  **University College London Hospitals**  **3rd Floor Mortimer Market Centre,**  **Mortimer Market,**  **London WC1E 6JB,**  **England**  **Serology Department contact details**  **0044 (0) 203 447 5413 / 8** | Yes  Copy saved on Q-drive – Microbiology – Referral Forms |
| **Toxoplasma gondii DNA** | * TOGD | Ocular fluid | PCR | 1 week | M | **Micropathology Ltd.,**  **University of Warwick Science Park,**  **Venture Centre,**  **Sir William Lyons Road,**  **Coventry, CV4 7EZ,**  **United Kingdom**  [**Tel: 0044**](Tel:0044) **247 632 3222** | Yes  Available through website:  [www.micropathology.com](http://www.micropathology.com) |
| ***Treponema pallidum* DNA** | TREP | Ocular fluid | PCR | 1 week | M |
| ***Trichomonas vaginalis*** | MCGT | Urine  Only refer when possible *Trichomonas* seen in the urine microscopy for confirmation  (*Set CT/NG to ‘returned’ on LIS prior to sending)* | PCR | 1 week | W | **National Virus Reference Laboratory,**  **UCD,**  **Belfield,**  **Dublin 4.**  **Tel: 01 716 4401** | No |
| **Varicella zoster DNA** | * VZVD | Ocular fluid | PCR | 1 week | M | **Micropathology Ltd.,**  **University of Warwick Science Park,**  **Venture Centre,**  **Sir William Lyons Road,**  **Coventry, CV4 7EZ,**  **United Kingdom**  [**Tel: 0044**](Tel:0044) **247 632 3222** | Yes  Available through website:  [www.micropathology.com](http://www.micropathology.com) |

## Reference Ranges and Critical Alert Ranges

Generally biological reference intervals do not apply to Microbiology, however, please see below for exceptions. Clinical decision values are listed below for both NMH and RVEEH.

Figure 43: Normal values for WBC, RBC, protein and glucose for various age groups in CSF

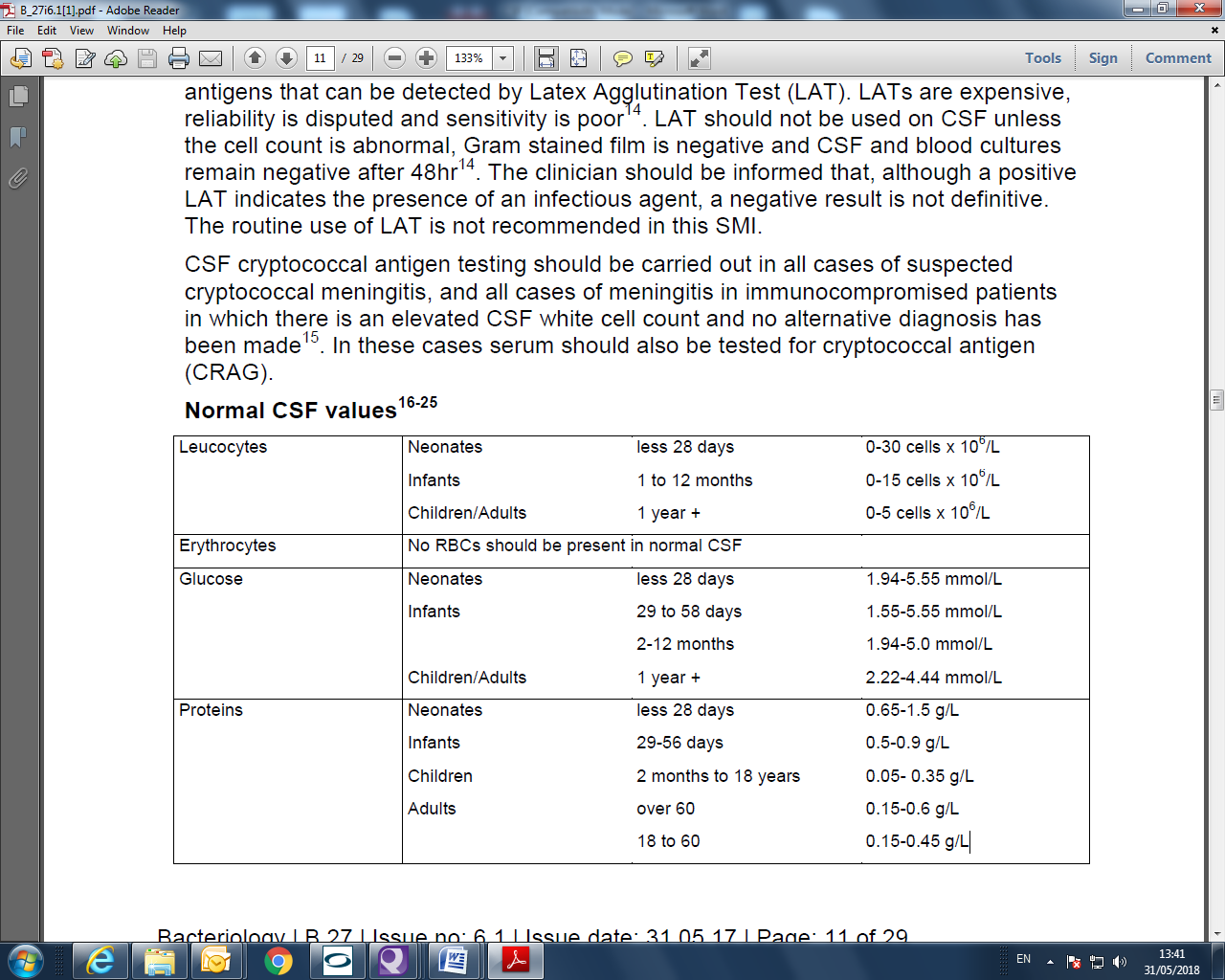


Figure 44: Microbiology Critical Alert Ranges

|  |  |  |  |
| --- | --- | --- | --- |
| **NMH** | | | |
| ***Organism*** | ***Notify*** | ***When*** | ***Notes*** |
| MRSA | * Consultant Microbiologist * Infection Control | * In-Patient: Notify at presumptive and when confirmed * Out-patient: Notify when confirmed | Consultant will decide action of “presumptive MRSA”. Strongly consider infection control precautions if presumptive MRSA case is an in-patient. |
| * Relevant Unit / Clinic | * In-Patient: * NICU: Notify at presumptive and when confirmed * All others: Notify when confirmed * Out-patient (adults and neonates): Notify when confirmed |
| Gentamicin-Resistant Enterobacterales | * Consultant Microbiologist * Infection Control * NICU (when applicable) | Once confirmed |  |
| VRE, CPE, ESBL | * Consultant Microbiologist * Infection Control * Relevant unit / clinic * Surveillance Scientist |
| *Clostridium difficile* |
| Norovirus |
| Influenza A / B / RSV | By Microbiology and On-Call (to relevant unit/clinic) |
| Bacterial faecal pathogens | * Consultant Microbiologist * Infection Control * Surveillance Scientist | E.g. *Salmonella, Shigella, Campylobacter* sp,  *E. coli* 0157 |
| SARS-COV-2 | * Consultant Microbiologist * Infection Control * Surveillance Scientist | Confirmed Detected | By Microbiology  By On-Call (to relevant unit/clinic, Occ Health send text to Consultant Microbiologist) |
| * Relevant unit / clinic (Patients) * Occupational health (Staff) | All in-patient results (Detected and Not Detected)  All Detected results from all locations (including ED, pre-op, clinics and occupational health) |
| Group A *Streptococci* | * Consultant Microbiologist * Relevant unit / clinic * Surveillance Scientist | Once confirmed |  |
| *Listeria* sp |
| *Neisseria gonorrhoeae* | When isolated from culture or by PCR. |
| *Pseudomonas* aeruginosa | Any neonate or eye patient | From any eye and neonate related specimens |
| Group B *Streptococci* | * Unit 3, Delivery Ward | Isolated for the first time from all antenatal / peripartum in-patients |  |
| * Relevant unit / clinic | All paediatric patients |
| Rapid GBS | * Unit 3 | All results (Detected and Not Detected) | By Microbiology and On-Call |

|  |  |  |  |
| --- | --- | --- | --- |
| **RVEEH** | | | |
| ***Organism*** | ***Notify*** | ***When*** | ***Notes*** |
| MRSA | * Relevant Clinic / Unit | In-Patient: Notify at presumptive and when confirmed |  |
| * Infection Control (by e-mail) | * In-Patient: Notify at presumptive and when confirmed * Out-Patient: Notify when confirmed |
| VRE, CPE, ESBL | * Consultant Microbiologist * Infection Control (Mon – Fri) * Relevant unit / clinic * Surveillance Scientist | Once confirmed |
| *Clostridium difficile* | Once confirmed |
| Norovirus | Once confirmed |
| Influenza A / B | Once confirmed |
| Bacterial faecal pathogens | * Consultant Microbiologist * Infection Control * Surveillance Scientist | Once confirmed | E.g. *Salmonella, Shigella, Campylobacter* sp, 0157 |
| SARS-COV-2 | * Consultant Microbiologist * Infection Control (Mon-Fri) * Surveillance Scientist * Relevant unit/clinic | Confirmed Detected | By Microbiology  By On-Call (to Relevant Unit/Clinic only and send text to Consultant Microbiologist) |
| Group A *Streptococci* | * Consultant Microbiologist * Infection Control (Mon – Fri) * Relevant unit / clinic * Surveillance Scientist | Once confirmed |  |
| *Listeria* sp. | Once confirmed |
| *Neisseria gonorrhoeae* | Once confirmed | When isolated from culture or by PCR. |
| *Pseudomonas* aeruginosa | * Consultant Microbiologist * Relevant unit / clinic | Any eye patient, presumptive identification | From any eye specimen |
| Acanthamoeba | * Consultant Microbiologist * Relevant unit / clinic | Any positive result | When isolated by culture or PCR |
| ***Sample Type*** | ***Notify*** | ***When*** | ***Notes*** |
| Blood Cultures, including ocular fluid in paediatric blood culture bottles | * Consultant Microbiologist | 08.00 – 22.00 with any positives. | By Microbiology and On-Call |
| Out of hours: Send pseudo-anonymised text message with positive gram stain and photograph of film array result to Consultant Microbiologist. If unable to interpret the gram stain contact the Consultant Microbiologist by phone.  If locum is covering - text message not required – clinical staff may phone locum | On-Call |
| * Relevant Unit / Clinic | Phone in-patient ward (634 3655 / 3657) with any positives and Gram stain. If no reply contact the Consultant Microbiologist 24/7 (exception to above).  *Exception: When Gram stain = “No Organisms Seen” – Telephoning not required.* | By Microbiology and On-Call |
| Corneal Scrapings | * Consultant Microbiologist * Relevant Unit / Clinic | Positive Gram stain |  |
| Culture positive as soon as preliminary identification is available |
| Vitreous / Aqueous Fluids | * Consultant Microbiologist * Relevant Unit / Clinic | Positive Gram stain |
| Culture positive as soon as preliminary identification is available |
| Faecal Occult Blood | * Relevant Unit / Clinic | Positive |
| Environmental Screening | * Pharmacy | >5 colonies of any types present on settle plates |

***Unless otherwise indicated, all results are phoned by Microbiology scientific staff.***

***Results are reported to infection control nurse by entering details on a protected shared excel sheet.***

***Unless otherwise indicated, all results are phoned by Microbiology scientific staff. Results are reported to infection control nurse by e-mail.***

* ***Any other clinically significant organisms may also be telephoned as required.***
* ***Significant isolates in other specimens and from known ill patients are telephoned to the Consultant Microbiologist before susceptibility tests are finalised.***
* In the event of NMH Consultant Microbiologist being on leave, locum cover is provided as arranged by NMH Consultant Microbiologist. advice the person taking the result that NMH Consultant Microbiologist is on leave, that cover is in place and they may be contacted if required.
* Out of hours, the scientist on-call is not required to contact the locum Consultant Microbiologist covering as per protocol above, informed clinical staff that NMH Consultant Microbiologist is on leave, that cover is in place and they may be contacted if required.
* Record all evidence of phoning results in the telephone log on LIS (LP-GEN-TELREP).

## Mandatory Reporting

The Microbiology laboratory reports all significant isolates and diagnoses from referral laboratories in accordance with the Infectious Diseases (Amendment) Regulations2020 (S.I. No. 53 / 2020). The surveillance scientist in conjunction with the Consultant Microbiologist keeps a record of all infections reported by the laboratory.

## Requesting Additional Examinations / Tests

* Additional tests may be requested by clinical staff and added onto some samples. The ability of the Microbiology laboratory to perform these additional tests depends on the test being requested and viability of the sample for that test.
* Additional examinations, if possible, may be requested following consultation with consultant microbiologist or senior scientific staff. All add on requests are entered in the laboratory information system.
  + Post processing of samples in Microbiology
    - CSFs are kept for 1 month refrigerated.
    - All other samples are kept for 1 week at room temperature – due to the storage conditions of these samples it is generally NOT possible to perform additional testing when the sample is >24 hours old from time processed.
    - Please check with the Microbiology department prior to ordering additional tests if possible to perform.
* Additional examinations also may be initiated by consultant microbiologist or senior scientific staff based on the results of initial examinations.

# Specimen Referral/Dispatch

## Specimen Referral

Where investigation is not available in the Department of Pathology and Laboratory Medicine at the National Maternity Hospital it may be referred to a third party laboratory for testing. Referral occurs in cases where there is a request for:

* The provision of a unique or unusual service.
* Provision of a service not available in the National Maternity Hospital.
* Confirmation of initial findings.
* Backup service in the event of an unplanned interruption of the service.
* Where a consultants second opinion in histopathology and cytology is required.
* It is policy to refer certain investigations to reference laboratories.

Where possible, work is referred to INAB or CPA accredited laboratories.

## Reports from Referral Laboratories

Reports from referral laboratories are managed in accordance with MP-GEN-RESREL

1. Test results are received in the Pathology Department of the National Maternity Hospital from the referral laboratory.
2. Results are logged into the LIS and an added comment identifies the referral laboratory.
3. Where possible results are received electronically via Medibridge.
4. Results of external examinations entered into Winpath are authorised by scientific or medical staff. Additional comments may be added by senior or consultant staff if appropriate. This authorisation process is controlled.
5. Where the referral laboratory report is sent by the laboratory to the ward a copy of the report is kept in the department. This may be in hard copy, electronic copy or transcribed to Winpath
6. Genetic reports received from a referral laboratory are not entered into Winpath due to the complexity of the report. The comment below is attached to all results in Winpath:

*The original report has been sent to the requesting doctor or consultant or may be together with the patient's chart. To retrieve a file / report please contact chart retrieval on extension 3421 / 3422 or medical records officer on extension 3208. Or alternatively contact the appropriate referral laboratory*

The original report is sent to the requesting clinician and/or unit and filed in the patients chart. A copy is retained in the laboratory.

# Virology Referral

Requests must be from a hospital clinic or consultant and must be submitted on the appropriate form with clinical details and signature.

Requests should be classified as follows:

* Routine (before 30 weeks): 1-2 weeks reporting time
* Late booking (after 30weeks): within 48 hours reporting time
* Urgent: 4 hours reporting time (HIV) or within 24 hours (Hepatitis B)
* The laboratory should be contacted when urgent specimens are being sent.

**Note:** the urgent category has significant staff and cost implications for the National Virus Reference laboratory and must only be used where necessary.

Figure 45: Referred test for Serology/Virology

| **Test** | **Code** | **Tube type** | **Special Requirements** | **Referral Centre** |
| --- | --- | --- | --- | --- |
| **Adenovirus PCR** | **ADEN** | **Faeces / Eye / CSF / Swab / Nasal**  **Aspirate / EDTA** | Change sample type on WinPath to suit specimen type received. | **NVRL** |
| **Anti-Hep B Core Total** | **HBC** | **Adult: Serum gel** |  |
| **Anti Pertussis Toxin IgG** | **COMS** | **Adult: Serum gel** | Clinical details are required. | **Microbiology, CHI Crumlin** |
| **Atypical Pneumonia** | **ATYA** | **Adult: Serum gel** | Mycoplasma IgM | **NVRL** |
| **Paed: Serum** |
| **Brucella ( RVEEH Only)** | **BRUC** | **Serum** | Spin to separate from cells. Stable on gel.  Separate + fridge if storing over the weekend | **MedLab Pathology** |
| **Cat Scratch Serology (Bartonella)**  **(RVEEH Only)** | **CATS** | **Serum** |
| **Rubella, Syphilis, HBsAg, HIV** | **BKBB** | **Adult: Serum gel** | When gestation >38 weeks or if requested urgently by phone enter Urgent comment in the clinical details field of LIS and phone NVRL to inform them it’s en route.  Send on same day where possible. Otherwise keep in fridge and send the following day first thing. | **NVRL** |
| **Rubella, Syphilis, HBsAg, HIV, Varicella** | **BKBV** |
| **Rubella, Syphilis, HBsAg, HIV, Varicella, Hep C Abs** | **BKBA** |
| **Chlamydia and Gonorrhoeae** | **MCG** | **Eye Swabs (non genital sites)** | White APTIMA specimen collection kit gen probe for RNA testing  ***Green top viral swabs are not suitable.*** |
| ***+Trichomonas vaginalis***  (for all genital / urinary specimens only) | **MCGT** | **Urine**  **Genital Swabs** | * Urine: Transfer from MSU jar to Chlamydia / Gonorrhoea transport containers within 24 hours. * Use relevant Aptima Specimen collection kit gen probe for RNA testing * Endocervical / Urethral: White APTIMA swab * HVS: Orange APTIMA swab * In Winpath enter sample type: * Endocervical: ***ENCS*** * Urethral: ***US*** * Urine:  ***U*** * Vaginal Swab: ***HVS*** or ***LVS*** (as indicated) |
| ***+Trichomonas vaginalis and Mycoplasma genitalium when:***   * From Preterm Surveillance Clinic * Clinical details are Pelvic Inflammatory Disease (PID), Tubo-Ovarian Abscess (TOA), Epididymorchitis * When M. genitalium specifically requested   (for genital specimens only) | **MCGP** | **Genital Swabs** |
| **CMV IgG and IgM** | **CMBL** | **Adult: Serum gel** |  | **NVRL** |
| **CMV PCR** | **CMVP** | **Urine, Saliva, EDTA, CSF, Amniotic Fluid** | **For EDTA samples**: They stable at room temperature for 24 hours from collection. Samples are sent to the NVRL as soon as possible (reach NVRL with 24 hours of blood draw).  If samples cannot be sent to the NVRL within 24 hours, centrifuge, separate, freeze and transport at -20˚C.  Samples must be separated within 24 hours of collection if not being sent to the NVRL.  All samples can be sent with the next scheduled courier.  Change sample type on WinPath screen to suit specimen type received. |
| **Enterovius PCR (e.g. hand, foot + mouth, also known as Coxsackie, Echo)** | **ENTV** | **Faeces /**  **Rectal / Throat Swabs / CSF / Serum** | Always order ENTV on Meconium samples.  Change sample type on request screen to suit specimen. |
| **Epstein Barr Virus Screen** | **EBVS** | **Serum / Plasma** |  |
| **Eye and Ear Viral Screen** | **RVEE** | **Viral Eye Swab** | Green top viral swab |
| **Hepatitis A** | **HEPA** | **Adult: Serum Gel** |  |
| **Paed: Serum** |  |
| **HBsAg** | **HBSC** | **Adult: Serum gel / EDTA plasma** | When gestation >38 weeks or if requested by phone urgently. Enter Urgent in the clinical details of the LIS and phone NVRL to inform them it’s en route. Send on same day where possible. Otherwise keep in fridge and send the following day first thing. |
| **Paed: Serum /**  **EDTA plasma** |
| **Hepatitis C Antigen** | **HCRT** | **Serum Gel** |
| **Hepatitis Screen (Hep B + Hep C)** | **HEPN** | **Adult: Serum gel** |
| **Paed: Serum** |
| **Hepatitis B Antibody Titre** | **HTIT** | **Adult: Serum gel** |  | **NVRL** |
| **Hepatitis B PCR / Viral Load** | **HBPC** | **Adult: EDTA /**  **Serum** | Samples are stable at room temperature for 24 hours from collection. Samples are sent to the NVRL as soon as possible (reach NVRL with 24 hours of blood draw).  If samples cannot be sent to the NVRL within 24 hours, centrifuge, separate, freeze and transport at -20˚C.  Samples must be separated within 24 hours of collection if not being sent to the NVRL.  EDTA is the preferable sample for both paeds and adults however serum is accepted by NVRL. |
| **Paed: EDTA /**  **Serum** |
| **Hepatitis C PCR / Viral Load** | **HCPC** | **Adult: EDTA /**  **Serum** |
| **Paed: EDTA /**  **Serum** |
| **Hepatitis B or C Genotying** | **HBGT**  **HCGE** | **EDTA Plasma** |
| **Hepatitis B and C Serology Work-Up (RVEEH Only)** | **HBC**  **HBSC**  **HCSC** | **Adult: Serum** | The following tests should be given; Anti Hep B core Total, Hep B s  Surface Antigen and Hep C antibodies. |
| **Hepatitis C Abs** | **HCSC** | **Adult: Serum Gel / EDTA Plasma**  **Paeds: Serum /**  **EDTA Plasma /**  **Lit Hep Plasma** |  |
| **Hepatitis D (Delta) Screen** | **HEPD** | **Adult: Serum Gel** | Spin to separate from cells. Stable on gel.  Separate + fridge if storing over the weekend |
| **Hepatitis E Screen** | **HEPE** | **Adult: Serum Gel** | Spin to separate from cells. Stable on gel.  Separate + fridge if storing over the weekend |
| **Herpes Simplex Virus 1 + 2 PCR** | **HERP** | **CSF / Viral Swab / Fluid / EDTA**  **Paed: Serum sample is acceptable** | **Urgent** send CSF ASAP within working day or freeze immediately if at the weekend. Change sample type on request to suit specimen.  **For EDTA: If does not reach NVRL within 24 hours, it must be spun, separated and frozen.**  If Herpes is requested on the form for a CSF sample use the CSF viral screen codes |
| **Herpes Simplex Virus Serology** | **HSER** | **Adult: Serum** |
| **Adult: EDTA**  **Paed: EDTA** |
| **HIV Antigen / Antibody** | **HIV** | **Adult: Serum Gel** |  | **NVRL** |
| **Paed: Serum** |
| **HIV PCR / Viral Load** | **HIVP** | **Adult: EDTA** | Samples are stable at room temperature for 24 hours from collection. Samples are sent to the NVRL as soon as possible (reach NVRL with 24 hours of blood draw).  If samples cannot be sent to the NVRL within 24 hours, centrifuge, separate, freeze and transport at -20˚C.  Samples must be separated within 24 hours of collection if not being sent to the NVRL.  NB: If any EDTA sample received for NVRL, check with requesting unit if for PCR (in case EDTA sample taken in error), if so, spin, separate and freeze. EDTA samples are generally for PCR. |
| **Paed : EDTA** |
| **HIV, Hepatitis Screen, Hep B Core** | **IVF** | **Adult: Serum Gel** | Only order if gold sticker is ticked. For all IVF patients use the code @IVFT in the clinical details field in LIS. |
| **HTLV Screen (1 + 2)** | **HTLV** | **Adult: Serum Gel / EDTA Plasma**  **Paed: EDTA Plasma** |  |
| **Influenza / Parainfluenza / RSV / Respiratory Panel** | **MRSC** | **Green Viral Swab /**  **E.T. Secretions** | Influenza, RSV and SARS CoV2 testing is available in NMH; Refer full respiratory panel to NVRL |
| **Immunoblot BORC (Confirmation Test for Lyme Disease)** | **COMS** | **Adult: Serum** | In the result entry field type the following “ Test being carried out” |
| **Lyme Disease (also known as Borrelia) (RVEEH and NMH Requests)** | **LYME** | **Adult: Serum** | Clinical details are a requirement for RVEEH requests. |
| **Measles and Mumps** | **MMSC** | **Adult: Serum** |  |
| **Measles Screen** | **MEAS** | **Adult: Serum** |  |
| **Measles or Mumps RNA PCR** |  | **Oracol Swab** |  |
| **Mumps Screen** | **MUMS** | **Adult: Serum** |  | **NVRL** |
| **Needle Stick Source** | **NSS** | **Adult: Serum** | **URGENT!!** Send to NVRL ASAP, phone to inform them it’s en route.  If needle stick source and recipient come together, order a HOLD on the recipient sample and send with the source sample. | In LIS, in clinical details field of the source's request entry, enter laboratory accession number of the recipients sample and vice versa. |  |
| **Needle Stick Recipient (Hold)** | **HOLD** | **Adult: Serum** | Note: If there is no needle stick Source sample it can wait to the next routine day, it’s not urgent.  Check the request form for any additional tests that may be requested and add to request on LIS. |
| **Norovirus / Winter Vomiting** | **SRSV** | **Stool** |  |  |
| **OHD SCREEN (Rubella, Anti-HBs Ab Titres, HBsAg, Anti-HB Core Total, Varicella, Measles + Mumps)** | **OHDS**  **HTIT**  **HBSC**  **HBC** | **Adult: Serum Gel** |  |
| **IVS (Sample ID Validated by OHD)** | **IVS** | **Adult: Serum Gel** | Only order if written on OHD forms. Brings in comment: SAMPLE ID VALIDATED BY OCC HEALTH |
| **Parvovirus Screen** | **PARV** | **Adult: Serum Gel**  **Paed: Serum /**  **Plasma** | If requested urgently by phone, send ASAP. Otherwise send with next courier. |
| **Parvovirus DNA** | **MPAR** | **Amniotic Fluid** |  |
| **Parechovirus** | **PARE** | **Green Viral Throat or Rectal Swab / Faeces / CSF / Serum** |  |
| **Quantiferon (TB)** | **QUTB** | **Special blood tubes (x4) from Biomnis** | Once sample is taken it must be kept @RT. Must be incubated 16 hours after collection. Has to be centrifuged within 3 days @3000RPM for 15 minutes.  Quantiferon TB Information form stored in Specimen Reception folder on desktop. Fill out form and send sample with routine courier. Quantiferon blood collection tubes are stored in fridge HH22 in specimen reception. | **Biomnis Ireland** |
| **Rotavirus** | **ROTS** | **Stool** |  | **NVRL** |
| **RSV Screen** | **RSVS** | **Naso-Pharyngeal Aspirate or swab** |  |
| **Rubella IgG** | **RUBN** | **Adult : Serum gel** |  |
| **Rubella IgM Screen** | **RUB** | **Adult : Serum gel** | Usually ordered as part of TORCH screen or specifically request Rubella IgM |
| **Paed : Serum** |
| **Syphilis (Also Known as RPR, TPPA , VDRL, Treponema pallidum)** | **WRO** | **Adult : Serum gel** |  |
| **Paed : Serum** |
| **Torch + Syphilis (Maternal)** | **TORM** | **Adult: Serum gel**  **Plasma (Lit Hep)** |  |
| **Torch + Syphilis (Paed)** | **TORP** | **Paed : Serum** |  |
| **Tetanus** |  | **Adult : Serum gel** | For assessing response. | **Immunology, SJH** |
| **Toxocara Abs (RVEEH Only)** | **TOCA** | **Serum** | Spin to separate from cells. Stable on gel.  Separate and fridge if storing over the weekend. | **MedLab Pathology** |
| **Toxoplasmosis** | **SWTS** | **Serum**  **Amniotic Fluid** | Consult with the Consultant Microbiologist  Complete the Toxoplasma reference form | **Toxoplasma Reference Unit, Public Health Wales** |
| **Toxoplasmosis** | **TOX** | **Adult : Serum gel** | Most requests are sent to NVRL.  If mother and baby paired samples – send to **Toxoplasma Reference Laboratory, Swansea, UK.** | **NVRL** |
| **Varicella Screen (Also Known as Chickenpox or Shingles or Varicella Zoster Virus)** | **VARS** | **Adult: Serum Gel / EDTA Plasma**  **Paed: Serum / EDTA Plasma** | Separate and refrigerate serum/plasma/EDTA Plasma for both Adults & Paeds. If molecular testing is requested and the sample is received over the weekend, separate and refrigerate sample. |
| **Viral Culture** | **VCUL** | **Viral swab**  **(Green Lid)** |  |
| **Viral PCR / PM Culture** | **VCUL** | **Tissue in viral transport medium** | Green top swab required for NMH (Viral swab). |
| **CSF Viral Screen: HSV, Varicella, CMV, Enterovirus, Parechovirus and Human Herpes Virus 6 PCR** | **HERP**  **VARS**  **CMVP**  **ENTV**  **HHV6** | **Paed: CSF / EDTA** | IF CSF viral screen is received over the weekend, please freeze sample.  For HPV 6 PCR paediatric plasma & serum can also be accepted. | **NVRL** |
| **Swab Viral Screen:**  **HSV, Varicella, Adenovirus** | **HERP**  **VARS**  **ADEN** | **Viral Swab**  **(Green Lid)** | Eye swabs or skin |
| **Viral Panel (RVEEH Only)** | **TOX**  **HSER**  **VARS**  **WRO**  **CMBL**  **EBVS** | **Adult: Serum** |  |
| **Zika Virus RNA** | **ZIKA** | **Serum**  **EDTA**  **Urine** | Change sample type on request entry.  Relevant travel and clinical details are mandatory prior to referring of sample.  **Clinical history:** Location and dates of travel **must** be included. Contact Consultant Microbiologist if no relevant information.  Serum is the preferred specimen of choice. |

**MOLECULAR TESTING**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **TEST** | **CODE** | **TUBE TYPE** | **SPECIAL REQUIREMENTS** | **REFERRAL CENTRE** |
| **Congenital Myasthenia Gene Panel** | **COMS** | **5ml EDTA** | Refrigerate if not being sent over the weekend. | **DNA Laboratory, Oxford Medical Genetics Laboratory** |
| **Cystic Fibrosis** | **COMS** | **EDTA** |  | **National Centre for Medical Genetics, Crumlin** |
| **Cytogenics** | **CHCT** | **CVS** | **Urgent** send ASAP with next courier.  Send sample urgently if after 15.30hrs to ensure delivery to Crumlin by 16.30hrs. If < 15.30 hrs send with routine courier. Retain a photocopy of the request form.  Change sample type on Win-Path to suit specimen type received. Retain a photocopy of the request form. If sent over the weekend, date and time stamp form and store at room temperature. Leave a note for Specimen Reception staff to inform them that there is a sample present. It will be sent on Monday morning. | **National Centre for Medical Genetics Crumlin** |
| **Cytogenics** | **CHRA** | **Amniotic Fluid** |  |
| **Cytogenics** | **CHRH** | **Heparin 4ml** | Send 1° sample. Retain a photocopy of the request form |
| **Cytogenics** | **TDL** | **Heparin 4ml or Products of Conception (POC)** | Lithium Heparin or POC required depending on test requested.  Change sample type on Winpath to suit specimen type received.  EDTA sample required for querying CF or Y deletions.  Send on same day where possible. Otherwise keep in fridge and send the following day. Change sample type on Winpath to suit specimen type received. Retain a photocopy of the request form. | **TDL Genetics** |
| **DNA Storage (Genetic Samples)** | **HOLD** | **EDTA / Serum** | Must include consultants name and clinical details on request form. Use comment code **@ HOCH** in Win-Path. **Send sample to Genetics Dept, OLHSC, Crumlin, Dublin 12.** | **National Centre for Medical Genetics Crumlin** |
| **Microarray** | **TDL** | **EDTA** | If Dr. W. Reardon patient, send to Crumlin | **National Centre for Medical Genetics, Crumlin** |
| **MOLE** | If not a Dr. W. Reardon patient, send to TDL | **TDL Genetics** |
| **Molecular Genetics** | **MOLE** | **EDTA / K3 Crossmatch EDTA** | If not sent out that day, keep in fridge and send the following day. Retain a photocopy of the request form. If sent over the weekend, store in fridge as it is delivered to the lab. It will be sent on Monday morning. | **National Centre for Medical Genetics, Crumlin** |

**REFERRAL LABORATORY DETAILS**

|  |  |  |
| --- | --- | --- |
| **REFERRAL CENTRE** | **ADDRESS** | **PHONE NUMBER** |
| **Biomnis Ireland** | Three Rock Road, Sandyford Industrial Estate, Dublin 18, D18 A4C0 | 01 295 8545 |
| Children’s Hospital Ireland (CHI), Crumlin | Children’s Hospital Ireland,  Crumlin, Dublin 12 | 01 409 6970 |
| National Centre for Medical Genetics, Crumlin |
| DNA Laboratory, Oxford Medical Genetics Laboratory | DNA Laboratory,  Oxford Medical Genetics Laboratory,  Churchill Hospital,  Headington,  Oxford, 0X3 7LE | 0044 (0)300 304 7777 |
| MedLab Pathology | Unit 3 Sandyford Business Park,  Burton Hall Road,  Sandyford Business Park,  Dublin 18, D18 E528 | 1800 303 349  01 293 3690 |
| NVRL | UCD,  Belfield, Dublin 4 | 01 716 4415 |
| Immunology, SJH | St. James’s Hospital, Dublin 8 | 01 416 2928 |
| TDL Genetics | TDL Genetics,  The Doctors Laboratory,  60 Whitfield Street,  London, W1T 4EU | 0044 207 307 7373 |
| Toxoplasma Reference Unit, Public Health Wales | Toxoplasma Reference Unit, Public Health Wales  Microbiology,  Singleton Hospital,  Swansea, SA2 8QA | 0044 (0)1792 285 055 |
| West of Scotland Regional Genetic Service | West of Scotland Regional Genetic Service.  Level 2 B Laboratory Medicine,  Southern General Hospital,  1345 Govan Road,  Glasgow G514TF | 0044 141 354 9300 |

NOTE:

For other virology requests please consult WI-CS-SR-2 or The NVRL User Manual at the following link <http://nvrl.ucd.ie/routine>

NOTE: If both serology and molecular test requests are made, please collect a separate specimen for each request

## Retrospective Requesting/Additional Requests

Samples are sent to NVRL and not retained in specimen reception. Additional tests may be requested within a year period by completion of a serology request. Highlight on the form that it is add on request to a previous sample sent to the laboratory and send form to specimen reception. Samples are stored in the NVRL for 12 months. All add on requests are entered in the laboratory information system.

**Molecular Genetics**

* Specimens for cytogenetics are handled by specimen reception and enquiries should be directed to this extension (3178/3545).
* Specimen reception must be informed in advance of any amniotic fluid or CVS specimen.
* Samples are sent to the referral centre the same day (Monday –Thursday) if received in the laboratory before 12.00hrs. On Friday samples can be received up until 2.15 pm. Samples received after this will be sent the following routine working day. Our courier provides a next day delivery to the referral centres.
* No samples for molecular genetics should be sent outside of routine hours (Monday – Friday 8am – 5pm)

Figure 46: Genetic Testing

| **Test/Profile** | **Adult: Sample Type (Vol)** | **Paediatric: Sample Type (Vol)** | **Referral Centre** | **Turnaround  Times** | **Special Requirements** |
| --- | --- | --- | --- | --- | --- |
| Prenatal Diagnosis  QF PCR | Amniotic Fluid  Or CVS | N/A | Genetics OLHSCC  and / or  Glasgow | 3 Working Days | Please do not take samples after 2.15pm on a Friday as specimens must be transported to UK overnight |
| Prenatal Diagnosis  Culture | CVS |  | Genetics OLHSCC  and / or  Glasgow | 3 Working Days | Please do not take samples after 2.15pm on a Friday as specimens must be transported to UK overnight |
| Molecular Genetics | EDTA  3ml | EDTA 1.3ml | Genetics OLHSCC | 14-21 Working Days | Monday to Friday only |
| Karyotyping | Lithium Heparin 3ml |  | TDL UK | 14-21 Working Days | Please do not take samples after 2.15pm on a Friday as specimens must be transported to UK overnight |
| Karyotyping  (Baby) |  | Lithium Heparin  1.3ml | OLHSCC | 14-21 Working Days | Monday to Friday only |
| Harmony Test | EDTA  3ml | N/A | TDL UK |  |  |

Please contact specimen reception for further information on specimen requirements for molecular genetics

# Appendices

## Appendix 1: Useful Referral Contact Numbers

| **Referral Laboratory** | **Address** | **Phone/Fax Number** |
| --- | --- | --- |
| **Haematology Laboratory Children’s Health Ireland at Crumlin** | Children’s Health Ireland at Crumlin  Dublin 12 | Phone:01-4096432  Fax: 01-4559014 |
| **National Centre for Medical Genetics** | Department of Clinical Genetics  Children’s Health Ireland at Crumlin Dublin 12 | Phone: 01-4096089 |
| **Haemolytic Laboratory** | Central Pathology Dept  St James Hospital  Dublin 8 | Phone: 01-4162394  01-4162909 |
| **Special Coagulation Laboratory (NCHCD)** | Central Pathology Dept  St James Hospital  Dublin 8 | Phone: 01-4162956 |
| **St. James Immunology Dept** | Central Pathology Dept  St James Hospital  Dublin 8 | Phone: 01-4162925  Fax: 01-4113008 |
| **St. Vincent’s Haematology Laboratory** | St. Vincent's University Hospital  Elm park  Dublin 4 | Phone: 01-2774280 |
| **St. Vincent’s Coagulation Laboratory** | St. Vincent's University Hospital  Elm park  Dublin 4 | Phone: 01-2774395 |
| **St. Vincent’s Immunology Laboratory** | St. Vincent's University Hospital  Elm park  Dublin 4 | Phone: 01-2774598  01-2773825 |
| **St. Vincent’s Biochemistry Laboratory** | St. Vincent's University Hospital  Elm park  Dublin 4 | Phone: 01-2214550 |
| **Nuclear Medicine Department** | St. Vincent’s UniversityHospital  Elm park  Dublin 4 | Phone: 01-2214378 |
| **St. James Nutrition Laboratory** | Central Pathology Dept  St James Hospital  Dublin 8 | Phone: 01-4162394 |
| **Cancer Molecular Diagnostics Laboratory** | Central Pathology Dept  St James Hospital  Dublin 8 | Phone: 01-4103588 |
| **Cytogenetics:** specimens to U.K. | Dept of Medical Genetics,  York Hill Hospital, NHS Trust, Glasgow | Phone: 00441412010377 |
| **National Virus Reference Laboratory(NVRL)** | University College Dublin,  Belfield,  Dublin 4 | Phone:01 7164414  Web: [www.ucd.ie/nvrl](http://www.ucd.ie/nvrl) |
| **TDL** | The Doctors Laboratory,  60 Whitfield Street,  London  W1T 4EU | Phone: 0044207307740900442073077373 |
| **Children’s Health Ireland at Temple Street Biochemistry:**  (Lactate, Organic Acids, Amino Acids) | Children’s Health Ireland at Temple Street Children’s Hospital  Dublin 1 | Phone: 01 878 4272  / 4273 / 4458 |
| **Biominis Laboratories** | Three Rock Road  Sandyford Industrial Estate  Foxrock | Phone: 01 - 2944108 |
| **The Rotunda Hospital** | Parnell Square,  Dublin 1 | 01-8171700 |

## 

## Appendix 2: Uncertainty of Measurement

Performance specifications and indications of uncertainty of measurement for internal tests are recorded in RF-CS-LM-90 [Calculated Uncertainty of Measurement for Laboratory Procedures] and are available from the individual laboratories (where appropriate) on request.

## Appendix 3: Microbiology Orders MN-CMS

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **MRSA Paediatric** | | | | **MRSA Adult** | |
| **Search Field** | | **Specimen Type** | | **Search Field** | **Specimen Type** |
| MRSA Screen MCS Paed NMH | | Nasal, Groin MRSA (Mon screen U8) | | MRSA Screen MCS Adult NMH | Groin Swab (MRSA) |
| Nasal, Groin, Umb MRSA (Mon screen U8) | |
|  | | Throat Swab MRSA |
| If MRSA + order individual swabs: | |
| Nasal Swab MRSA | | Nasal Swab MRSA Adult |
| Groin Swab MRSA | |
| Umbilical Swab MRSA (If applicable) | |
| **Rectal Swabs Paediatric (VRE, CPE, Gent Res GNB)** | | | | **Rectal Swabs Adult** | |
| **Search Field** | | **Specimen Type** | | **Search Field** | **Specimen Type** |
| VRE Screen MCS NMH | | Rectal Swab Paed (Tues Screen U8) | | CRE screen MCS NMH | Rectal swab |
| Faeces |
| VRE screen Adult | Rectal swab |
| Faeces |
| **Blood Cultures Paediatric** | | | | **Blood Cultures Adult** | |
| **Search Field** | **Specimen Type** | | | **Search Field** | **Specimen Type** |
| Blood Culture MCS Paed NMH | Blood Culture MCS Paed NMH | | | Blood Culture MCS Adult NMH | Blood Culture MCS Adult NMH |
| **Urine Paediatric** | | | | **Urine Adult** | |
| **Search Field** | | **Specimen Type** | | **Search Field** | **Specimen Type** |
| Urine MCS Paed NMH | | Urine MCS Paed NMH | | Urine MCS NMH | Urine MCS NMH |
| Urine Catheter |
| hCG Detection, Urine NMH | hCG Detection, Urine NMH |
| **Faeces Paediatric for C&S** | | | | **Faeces Adult for C&S** | |
| **Search Field** | **Specimen Type** | | | **Search Field** | **Specimen Type** |
| Faeces Paed MCS NMH | Faeces Paed MCS NMH | | | Faeces MCS NMH | Faeces |
| **Vaginal swabs for C&S** | | | | **Endocervical swab for C&S** | |
| **Search Field** | **Specimen Type** | | | **Search Field** | **Specimen Type** |
| High vaginal swab Antenatal MCS NMH | High vaginal swab | | | Endocervical Swab MCS NMH | Endocervical Swab MCS NMH |
| Low vaginal swab | | |
| High vaginal swab Postnatal & Gynae NMH | High vaginal swab | | | Urethral swab MCS NMH |
| Low vaginal swab | | |
| **GBS Screening Adults** | | | | | |
| **GBS CULTURE ONLY** | | | | **GBS Rapid Molecular Test (Unit 3)** | |
| **Search Field** | **Specimen Type** | | | **Search Field** | **Specimen Type** |
| Low vaginal swab GBS MCS NMH | Low vaginal swab | | | Rapid GBS | LVS & Rectal Group B |
| Rectal swab for GBS MCS NMH | Rectal swab for GBS MCS NMH | | |
| **Other Rapid Molecular Testing** | | | | | |
| Rapid Influenza | | | | Nasal swab | |
| Nasopharyngeal aspirate | |
| Rapid Clostridium difficile | | | | Faeces | |
| Rapid Norovirus | | | | Faeces | |
| **Cerebrospinal Fluid Paediatric** | | | | **Eye swab for C&S** | |
| **Search Field** | | | **Specimen Type** | **Search Field** | **Specimen Type** |
| Cerebrospinal Fluid MCS Paed NMH | | | Cerebrospinal Fluid MCS Paed NMH | Eye Swab MCS NMH | Left Eye Swab |
| Right Eye Swab |
| **Wound Swabs/Episiotomy for C&S** | | | | **Expressed Breast Milk/Nipple Swabs for C&S** | |
| **Search Field** | | **Specimen Type** | | **Search Field** | **Specimen Type** |
| Wound Swab MCS NMH | | Abdominal Wound | | Expressed Breast Milk MCS NMH | Expressed Breast Milk Left |
| Laporoscopy Wound Swab | | Expressed Breast Milk |
| LSCS | | Expressed Breast Milk Right |
| Suture from Wound | | Microbiology Culture NMH | Breast Abscess |
| Wound Swab | | Breast Swab |
| Microbiology Culture NMH | | Episiotomy | | Left Breast Abscess |
| Right Breast Abscess |
| Nipple Swab Left |
| Nipple Swab Right |
| **Endotracheal Samples/ Secretions for C&S** | | | | **Tips and Devices for C&S** | |
| **Search Field** | | **Specimen Type** | | **Search Field** | **Specimen Type** |
| Endotracheal MCS, NMH | |  | | Tips and Devices MCS NMH | Arterial Line Tip |
| E.T Aspirate | | Central Line Tip |
| ETT Secretions | | CVP Tip |
| Nasal Aspirate | | E.T. Tube Tip |
| Nasal Secretions | | Long Line Tip |
| Nasopharyngeal Aspirate | | PICC Line |
| Nasophayngeal Secretions | | PICC Line Tip |
|  | | UAC Tip |
| UVC Tip |
| **Fluids for C&S** | | | | | |
| **Search Field** | **Specimen Type** | | | **Specimen Type** | **Specimen Type** |
| Fluid MCS NMH | Abdominal Fluid | | | Drain Fluid | Peritoneal Fluid |
| Ascitic Fluid | | | Fluid | Pleural Fluid |
| Body Fluid | | | Joint Fluid | Synovial Fluid |
| Breast Cyst Fluid | | | Ovarian Cyst Fluid | Vesicle Fluid |
| Cyst Fluid | | |  |  |
| **Miscellaneous Samples** | | | | | |
| **Search Field** | **Specimen Type** | | | **Specimen Type** | **Specimen Type** |
| Microbiology Culture NMH | Abdominal Swab | | | Labial Swab | Pus Swab |
| Abscess | | | Lesion ( Back ) | Rectal Abscess Swab |
| Abscess Pus | | | Lesion ( Chest ) | Retained Tampon |
| Abscess Swab | | | Lesion ( Face ) | Scalp Swab |
| Aspirate | | | Lesion ( Groin ) | Scrotal Aspiration |
| Bartholins Sbscess | | | Lesion ( Left Leg ) | Semen |
| Bartholins Cyst | | | Lesion ( Leg ) | Serous Fluid |
| Blister Swab | | | Lesion ( Rectal ) | Sinus Aspirate |
| Boil | | | Lesion ( Right Leg ) | Sinus Swab Left |
| Bronchial Aspirate | | | Lip Swab | Sinus Swab Right |
| Bronchial Brushings | | | Liquor | Skin Scrapings |
| Bronchial Washings | | | Meconium | Stomach Swab |
| Burns Swab | | | Oesophageal Swab | Suprapubic Swab |
| Buttock Swab | | | Other (Not Coded) | Swab |
| Cervical Swab | | | Penile Surface Swab | Trachael Swab |
| Cheek Swab | | | Penile Swab | Tracheostomy Discharge |
| Cyst Swab | | | Perianal Swab | Ulcer Swab |
| Discharge | | | Perineal Swab | Ulcer Swab (Left Leg) |
| Gastric Aspirate | | | Peritoneal Fluid Swab | Ulcer Swab (Right.Leg) |
| Gastric Brushings | | | Peritoneal Swab | Umbilical Swab |
| Gastric Contents | | | Peritoneal Washings | Uterine Swab |
| Microbiology Culture NMH | Gastric Washings | | | Placental Swab | Vaginal Cyst |
| Groin Swab | | | Post-Coital Aspirate | Vesicle Swab / Scraping |
| Intrauterine Swab | | | Pressure Sores | Vulval Swab |
| IV Site | | | Pus |  |
| **Search Field** | **Specimen Type** | | | **Search Field** | **Specimen Type** |
| Intra-Uterine Device MCS NMH | Intra-Uterine Device | | | Mouth or Throat General MCS NMH | Mouth Swab |
|  |  | | |  | Throat Swab |
| Mycoplamsa / Ureaplasma MCS NMH | HVS | | |  |  |
|  | Swab | | | Sputum MCS NMH | Sputum |
|  |  | | |  |  |
| Ear and Nose, General MCS NMH | Ear Swab | | | Tuberculosis Investigation NMH | Tuberculosis Investigation |
|  | Ear Swab Paed | | |  |  |
|  | Left Ear Swab | | | Legionella Antigen Blood NMH | Legionella Antigen Blood |
|  | Left Ear Swab Paed | | | Legionella Antigen Urine NMH | Legionella Antigen Urine |
|  | Right Ear Swab | | |  |  |
|  | Right Ear Swab, Paed | | |  |  |
|  | Nasal Swab Adult | | |  |  |
|  | Nasal Swab | | |  |  |
|  | Nasopharyngeal Swab | | |  |  |
|  | Skin Swab | | |  |  |
|  | Tongue Swab | | |  |  |