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Amendment table

<table>
<thead>
<tr>
<th>Section(s) Updated</th>
<th>Reason for revision</th>
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<tr>
<td>(FBC) Full Blood Count</td>
<td>Remove the comment 'Includes White Cell Differential – Neutrophil, Lymphocyte, Monocyte, Eosinophil and Basophil counts' from FBC description.</td>
</tr>
<tr>
<td>Reticulocyte count.</td>
<td>Replace the statement 'Requests should be received by the laboratory within 12 hours of phlebotomy’ with ‘Requests should be received by the laboratory within 8 hours of phlebotomy.’</td>
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</tbody>
</table>

Opening hours of the Laboratory

- The Laboratory services for Nenagh Hospital consist of an ‘on-site’ STAT Laboratory to accommodate Hospital ‘in-patients’ i.e. Hospital Wards, OPD, LIU and Clinics, requiring Biochemistry and Haematology tests.
- The laboratory opening hours are from 09:00 to 13:00 and 14:00 to 17:00 hours, Monday through to Friday with a ‘cut-off’ specimen receipt time of 16:30hrs. Turnaround times listed in this manual are for specimens processed in Nenagh laboratory. Please refer to the UHL Laboratory User Manual for turnaround times for specimens processed in UHL. Refer to page 3 for information on accessing the UHL Laboratory user manual.
- There will be two taxi trips per routine working day taking samples to UHL Laboratories – at approximately 10:00 hrs and 14:00 hrs respectively.
- All laboratory test requests ‘after-hours’ including weekends/Public Holidays which require urgent analysis are sent to UHL Laboratories via taxi co-ordinated by the Director of Nursing office in Nenagh.
- Samples for transfusion testing are taken in Nenagh and sent to Limerick with the daily laboratory delivery at 10:00 hrs and 14:00 hrs.
- As the majority of transfusions administered in Nenagh are elective, the majority of samples should be sent during working hours.
- The transfusion laboratory in Limerick is contacted in advance to advise them of all out of hours’ samples for transfusion testing from Nenagh.
- In the event of a requirement for emergency transfusion, four units of group O Rh D negative red cell concentrate are available in the issue fridge in Nenagh.

Sample transfer to Limerick

- Tests performed in Nenagh Hospital Pathology Department are listed in the test repertoire of this manual and on the Nenagh Pathology request form.
- Separate request forms and specimens are required for tests performed in UHL.
- The Nenagh Pathology laboratory acts as a dispatch point for the transfer of specimens to the relevant laboratory discipline in Limerick, at the following times; 10:00 hrs and 14:00 hrs.
- Please note that samples are registered on the Laboratory Information System on arrival at the relevant laboratory in UHL.

Location of Laboratory

- The Pathology is located in the left wing of the hospital, past Accident & Emergency & Radiology departments. At the end of this corridor take a right turn & the pathology front entrance may be seen.
- Access to Pathology Reception and Laboratories is restricted to hospital personnel on related laboratory business via swipe card.

Contact numbers for the Pathology Department

<table>
<thead>
<tr>
<th>Laboratory</th>
<th>Ext/Phone numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laboratory Nenagh</td>
<td>Ext 355/356</td>
</tr>
<tr>
<td>Microbiology Laboratory UHL</td>
<td>061 482255 / 061 482240</td>
</tr>
<tr>
<td>Biochemistry Laboratory UHL</td>
<td>061 482256 / 061 482257</td>
</tr>
<tr>
<td>Haematology Laboratory UHL</td>
<td>061 482258 / 061 482249</td>
</tr>
<tr>
<td>Blood Bank UHL</td>
<td>061 482267 / 061 482035</td>
</tr>
<tr>
<td>Serology/Virology UHL</td>
<td>061 482797 / 061 482254</td>
</tr>
</tbody>
</table>
Please be advised that the UHL Laboratory User Manual provides a more comprehensive overview of policies, procedures and services across the UL Hospital Pathology Laboratories, as well as sample requirements including details on requests for additional tests, test repertoire, test turnaround times for all disciplines and can be accessed as follows:

1. QPulse – Acutes Database - DIAG-LAB-LUR-4
2. iHUB
3. UL Hospitals Web Page via the following link:
   http://www.hse.ie/eng/services/list/3/acutehospitals/hospitals/ulh/staff/resources/pppgs/labmanual.html

Laboratory User Manual
The Laboratory User Manual provides information to Clinicians and Nursing Staff on the Pathology Department Laboratories and the requirements of the Pathology department when sending sample requests to the laboratory for testing and the test repertoires and turnaround times of the respective laboratory disciplines. Please note that turnaround times exclude closed periods in the laboratory. See above for hours of operation.

Procedure for looking up Test results
1. Double click on icon or desktop NMM/APEX/Port Term
2. Enter Username
3. Enter Password
4. At selection Option Enter 1
5. Press Return x2
6. Press 1 for Ward Enquiry,
7. Having logged onto the Ward enquiry menu, select/type 1 or WRNQ.
8. The following screen is then displayed.

9. Enter Patient’s Hospital Number
10. Enter first 2 letters of patient’s surname.
11. N.B. IF RESULTS CANNOT BE FOUND UNDER CHART NUMBER, DO A SEARCH UNDER THE DATE OF BIRTH.
12. Enter U (for unknown) under the patient hospital number & press return.
13. Then enter surname of patient.
14. Return until cursor reaches forename.
15. Enter first name of patient and press return.
16. Enter Patient D.O.B.
17. Enter F or M (for Male or Female).
18. Press return until cursor is at bottom of screen.
19. When cursor is on A (for accept) at bottom of screen press return.
20. Choose patient by using arrow up or down & press return.
21. Please note; Results outside reference ranges are marked a colour change on iLAB and with an asterisk on hard copy reports.
22. Please note that preliminary reports are identified as ‘NOT FULLY AUTHORISED’ in the grey bar at the top of the screen, and these results may be subject to change.

Alanine Transaminase
Specimen type:
Serum

Special requirements or comments:
This assay is available as part of the liver test profile.
Please ensure that specimens for the assay of transaminase activity (ALT or AST) are delivered to the Laboratory within 24 hours of sample collection.

Turnaround time:
2 hours

Reference range:
On Biochemistry report or contact laboratory.

Albumin
Specimen type:
Serum

Special requirements or comments:
None

Turnaround time:
2 hours

Reference range:
On Biochemistry report or contact laboratory.

Alkaline Phosphatase
Specimen type:
Serum

Special requirements or comments:
Assay is also available as part of the liver and bone test profiles.

Turnaround time:
2 hours

Reference range: On Biochemistry report or contact laboratory.

Amylase
Specimen type:
Serum

Special requirements or comments:
None.

Turnaround time:
2 hours.
Reference range:
On Biochemistry report or contact laboratory.

Bilirubin
Specimen type:
Serum.

Special requirements or comments:
Protect sample from sunlight. This assay is also available as part of the liver test profile.

Turnaround time:
Availability of assay: daily, throughout 24 hours.

Reference range:
On Biochemistry report or contact laboratory.

Calcium
Specimen type:
Serum.

Special requirements or comments:
Prolonged venous compression during blood collection will increase serum calcium.

Turnaround time:
2 hours

Reference range:
On Biochemistry report or contact laboratory.

Important notes:
Albumin is the principal binding protein for calcium. A decrease in serum/plasma albumin will lead to a fall in albumin-bound calcium and a decrease in total calcium concentration and vice versa. Therefore serum albumin should always be requested with serum calcium. Total serum calcium can be ‘adjusted’ to ‘correct’ for changes in serum albumin. This adjustment of total calcium is to that expected to be present at an albumin concentration of 40 g/L. The adjustment equation used in this laboratory is as follows:

Adjusted calcium (mmol/L) = \((40 - \text{albumin}) \times 0.02\) + measured calcium.

Chloride
Specimen type:
Serum

Special requirements or comments:
This assay is also available as part of the electrolyte profile.

Turnaround time:
2 hours

Reference range:
On Biochemistry report or contact laboratory.

Cholesterol
Specimen type:
Serum

Special requirements or comments:
Prolonged venous compression during blood collection will increase serum cholesterol.
Turnaround time:
2 hours

Reference Range:
On Biochemistry report or contact laboratory.

Cholesterol: HDL fraction
Specimen type:
Serum

Special requirements or comments:
Fasting specimen

Turnaround time:
2 hours

Reference range:
On Biochemistry report or contact laboratory.

Cholesterol: LDL fraction
Specimen type:
Serum

Special requirements or comments:
Fasting specimen

Turnaround time:
2 hours

Reference range:
On Biochemistry report or contact laboratory.

Creatine Kinase
Specimen type:
Serum

Special requirements or comments:
After the onset of myocardial infarction, the diagnostic window is from the 12th to the 24th hour. Note that values may be raised by exercise, intramuscular injections and bruising. Haemolysis interferes with the assay resulting in falsely raised values.

Turnaround time:
2 hours

Reference range: On Biochemistry report or contact laboratory.

Creatinine
Specimen type:
Serum

Special requirements or comments:
In the case of blood specimens for creatinine assay, the serum should be separated from the red blood cells within five hours of venepuncture; otherwise substances are released from the red blood cells, which cause falsely raised serum creatinine concentrations.

Turnaround time:
2 hours

**Reference range:** On Biochemistry report or contact laboratory.

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**CRP (C-Reactive Protein)**

**Specimen type:**
Serum

**Special requirements or comments:**
The CRP assay is not employed as a high sensitivity assay and should not be used as a predictor of future coronary events.

Please note – Measurement of CRP is not indicated in asymptomatic individuals and should not be appended to routine investigations.

**Turnaround time:**
2 hours

**Reference range:**
On Biochemistry report or contact laboratory.

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**D-Dimers**

**Specimen type:**
Citrated plasma (blue top)

**Special requirements or comments:**
1) All requests must include relevant clinical details.
2) D dimer testing should only be carried out in the community when assessing patients with low risk based upon a clinical score of a thrombosis (Well’s criteria for DVT assessment).
3) Requests should be delivered promptly to the laboratory to allow analysis with **3 hours** of phlebotomy.

**Turnaround time:**
1 hours

**Reference range:**
See report form

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**eGFR (estimated glomerular filtration rate)**

**Specimen type:**
Serum

**Note:** calculation is based on the 4v-MDRD Formula and is only applicable to adults (i.e. patients greater than 18 years old).

**Special requirements or comments:**
The serum should be separated from the red blood cells within six hours of venepuncture; otherwise substances are released from the red blood cells, which cause falsely raised serum creatinine concentrations.

**Turnaround time:**
2 hours

**Reference range:**
greater than 90 mL/min/1.73m²

**Important notes on Estimated GFR in adults using formulae**
1) Estimated GFR is calculated using the 4v-MDRD Formula (with creatinine assay calibration traceable to ID-MS).
2) Estimates of GFR are unreliable in acute renal failure due to the kinetics of creatinine accumulation.
3) GFR estimates between 60 and 89 mL/min/1.73m² do not indicate CKD unless there is other laboratory/clinical evidence of disease.
4) Estimated GFR should be multiplied by 1.212 for African-American patients.
IDMS-traceable MDRD Study Equation for serum creatinine reported in SI units

\[
eGFR (\text{mL/min/1.73 m}^2) = 175 \times (\text{serum creatinine (µmol/L}) \times 0.011312)-1.154 \times \text{(Age)}-0.203 \times (0.742 \text{ if female})\times (1.212 \text{ if African American})
\]

The IDMS-traceable MDRD Study equation is for laboratories that use creatinine methods that have been calibrated to be traceable to IDMS.


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**ESR**

**Specimen type:**
EDTA (lilac top). Please fill the bottle to the mark to ensure sufficient volume for testing.

**Special requirements:**
Requests should be received by the laboratory within 6 hours of phlebotomy.
If ESR is delivered to the laboratory after 16:00, laboratory staff must be informed if the ESR result is required urgently.

**Turnaround times:**
- Non urgent requests: 24 hrs
- Urgent requests: 3 hrs

**Reference range:**
See report form.

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**(FBC) Full Blood Count**

**Specimen type:**
EDTA (lilac top). Please fill the bottle to the mark to ensure sufficient volume for testing.

**Special requirements or comments:**
After 24 hours, WBC differential and red cell indices are affected by EDTA changes.
Ensure samples are not taken from a drip site, as this results in haemodilution of the sample.
Please note that the review of blood film morphology is performed in UHL.

**Turnaround times:**
1 hours

**Reference range:**
See report form.

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**Gamma Glutamyl Transferase**

**Specimen type:**
Serum

**Special requirements or comments:**
This assay is also available as part of the liver test profile.

**Turnaround time:**
2 hours

**Reference range:**
On Biochemistry report or contact laboratory.

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**Glucose**

**Specimen type:**
Glucose specimen tube containing sodium fluoride EDTA as anticoagulant.
Special requirements or comments:
Record specimen collection time and state whether the specimen is fasting, post-prandial or part of a glucose tolerance test.

Turnaround time:
2 hours

Reference range:
On Biochemistry report or contact laboratory.

hs Troponin T The high sensitivity Troponin T (hs-TnT)
Specimen type:
Serum

Special requirements or comments:
Two samples should be collected, at admission and 6-9 hours later.

Turnaround time:
2 hours

Reference range:
On Biochemistry report or contact laboratory.

Limitations:
Haemolysed samples are unsuitable for analysis as haemolysis interferes negatively with the hs-TnT assay, thus causing potential underestimation of the actual result.

Lactate Dehydrogenase
Specimen type:
Serum

Special requirements or comments:
Note: haemolysis invalidates the assay.

Turnaround time:
2 hours

Reference range:
On Biochemistry report or contact laboratory.

Magnesium
Specimen type:
Serum.

Special requirements or comments:
Blood specimens for magnesium assay must be collected free of haemolysis.

Turnaround time:
2 hours

Reference range:
On Biochemistry report or contact laboratory.

Phosphate
Specimen type:
Serum.
Special requirements or comments:
Blood specimens for phosphate assay must be collected free of haemolysis. The serum must be separated within a period of two hours from venepuncture, since phosphate is released from red blood cells during the transport and storage of whole blood specimens thus causing a falsely raised serum phosphate concentration.

Turnaround time:
2 hours

Reference range (adult):
On Biochemistry report or contact laboratory.

Potassium
Specimen Type:
Serum

Special requirements or comments:
Blood specimens for potassium assay must be collected free of haemolysis. The serum must be separated within a period of two hours from venepuncture, since potassium is released from red blood cells during the transport and storage of whole blood specimens thus causing a falsely raised serum potassium concentration.

Turnaround time:
2 hours

Reference range (adult):
On Biochemistry report or contact laboratory.

Pregnancy Test
Specimen Type
Urine: Minimum volume: 1ml in sterile universal container

Special requirements or comments:
Do not use boric acid containers. Serum HCG levels are performed in the Biochemistry Department UHL.

Turnaround time:
30 mins

Reticulocyte Count
Specimen type:
EDTA (lilac top). Please fill the bottle to the mark to ensure sufficient volume for testing.

Special requirements or comments:
Requests should be received by the laboratory within 8 hours of phlebotomy.

Turnaround times:
2 hours

Reference range: See report form

Sodium
Specimen type:
Serum

Special requirements or comments:
Blood specimen should be collected free of haemolysis.

Turnaround time:
2 hours
Reference range:
On Biochemistry report or contact laboratory.

Total Protein
Specimen type:
Serum

Special requirements or comments:
Prolonged venous compression during blood collection will increase serum protein.

Turnaround time:
2 hours

Reference range:
On Biochemistry report or contact laboratory.

Triglyceride
Specimen type:
Serum

Special requirements or comments:
Serum triglyceride is subject to major increases following meals and may also be released after prolonged fasting. A 12-hour fast is essential for meaningful triglyceride measurements.

Turnaround time:
2 hours

Reference range:
On Biochemistry report or contact laboratory.

Urea
Specimen type:
Serum

Special requirements or comments:
This assay is also available as part of the U+E test profile

Turnaround time:
2 hours

Reference range:
On Biochemistry report or contact laboratory.

Uric Acid (Urate)
Specimen type:
Serum

Special requirements or comments:
None

Turnaround time:
2 hours

Reference range:
On Biochemistry report or contact laboratory.
Storage of examined samples
Examined samples are stored at 2-8°C for a minimum of 7 days in the laboratory.

Additional examinations
Additional examinations may be requested by telephone but all telephone requests must be followed up with a request form. The laboratory will advise the requestor if the time limits for requesting additional examinations have been exceeded.