

Paediatric User Handbook

1. Contents

1. Contents.....	2
2. Introduction	3
3. Laboratory Opening Times.....	3
4. Location of the Laboratory.....	3
5. Laboratory Advice/General Enquiries.....	3
6. Clinical Advice/Interpretation.....	3
a. For Urgent Advice.....	3
b. For Non-Urgent Advice	4
7. Request for Immunology Analyses	4
a. How Much Blood is Needed?.....	4
8. Specimen Handling	4
9. Transportation of Specimens to the Laboratory.....	5
10. Specimen Reception	5
11. Additional Tests.....	5
12. Turnaround Times.....	6
13. Measurement of Uncertainty	6
14. Referred Work.....	6
15. Immunology Tests Performed In-House	7

2. Introduction

Dear Colleagues,

In this handbook you will find basic information concerning the Immunology department, including location and telephone numbers. Details of commonly requested tests and other services are given, together with the turnaround time for some tests. You may already be in possession of some of these facts, and this guide is really a compilation of the appropriate information in one booklet. Please contact laboratory on 01709 424250 if any further information or guidance on unusual tests is required.

Although laboratory turnaround times are shown, experience has indicated that unexpected delays can occur with either instrument failure and/or in the transmission of results.

3. Laboratory Opening Times

Normal Service: Monday - Friday 09.00 hrs – 17.00 hrs

On call services in Biochemistry, Haematology / Blood Bank and Microbiology outside these hours but **no** out of hours services in Immunology.

4. Location of the Laboratory

The Laboratory is situated on 'A' level (top floor). Following the signs for Pathology, at the T junction near the central lifts, go down the corridor opposite the lifts and the Pathology department is first on the left double wooden doors. Pathology Reception is straight ahead.

5. Laboratory Advice/General Enquiries

Immunology Manager/Immunology Senior:

Direct Line: 01709 424250
Internal: 4250

Extensions can be obtained via the Hospital Switchboard 01709 820000.

For urgent requests: 01709 424250 (internal 4250)

6. Clinical Advice/Interpretation

Dr Shrimpton currently works on Mondays, Wednesdays and Fridays. Dr Shrimpton is at Rotherham Immunology laboratory one Monday per month (usually the third or fourth Monday of the month) and she is in the office at NGH on the other Mondays.

a. For Urgent Advice

- If urgent advice is required on Monday when Dr Shrimpton is not in Rotherham, ring her at the Northern General Hospital on 0114 2715727.

- If urgent advice is required on a Wednesday or a Friday, call her secretary on 0114 2269020 or email anna.shrimpton@sth.nhs.uk
- On Tuesdays or Thursdays or if Dr Shrimpton not available, try Graeme Wild or Kirsty Swallow (clinical scientists at STH) on 0114 2715394

b. For Non-Urgent Advice

Email anna.shrimpton@sth.nhs.uk or contact the Laboratory on x4250.

7. Request for Immunology Analyses

Samples for Meditech and ICE requests should be received in the appropriate green bags and general request forms must be accompanied by the appropriate samples. Remove the brown self-adhesive tape to reveal the glued area, and then fold along the perforations so the glued area attaches to the plastic and securely seals the specimen bag. Remove the second brown self-adhesive tape and attach the specimen bag to the top section of the request form.

a. How Much Blood is Needed?

The yield of plasma/serum from whole blood can vary greatly and will be affected by haematocrit etc. The whole blood requirements listed below are therefore estimates of minimum volumes required. In general SERUM tubes should be used. As more plasma than serum can be harvested from whole blood however, for neonates plasma (lithium heparin tubes) may be used instead. Please note, however, that **for some assays it is not possible to use plasma samples**. Please check the following list for sample requirements before venepuncture.

For neonates and small children the recommended tubes are Sarsted Microtubes. For older children or if larger volumes of blood are required the monovette sarstedt tubes may be useful. Unless the sample taken is of sufficient quantity to perform all assays requested, in house assays will be performed first and any remaining serum/plasma will subsequently be sent for assays performed elsewhere.

Sarsted Microtubes (*hold approximately 1.3 mL blood*).

SERUM is obtained from the PLAIN/CLEAR cap tube

PLASMA is obtained from the ORANGE cap tube (which contains lithium heparin as anticoagulant).

Sarstedt Monovette Tubes (*hold approximately 5 mL blood*).

SERUM is obtained from the BROWN cap tube

PLASMA is obtained from the ORANGE cap tube (which contains lithium heparin as anticoagulant).

8. Specimen Handling

Manual request forms must have clear legible labelling on the form and specimens for Meditech, ICE and manual requests must be legible.

A fully completed request form must include:-

- Patient's full name
- Date of birth
- Rotherham Hospital number and / or NHS No
- Ward
- Initials of the patient's Consultant

Patient Details on Samples must include:-

- Patient's full name, DOB plus either Rotherham hospital No or NHS number.
- Date and time sample taken

Current laboratory criteria for accepting/rejecting samples are that all forms and samples should have a minimum of the full name (forename and surname), DOB and either the patient hospital or NHS number. A&E only can either use a hospital or A&E number.

Ensure the lid of all specimen bottles is secured before the bottle is placed into the plastic pockets. All specimen bottles must be placed in the correct plastic pocket. Samples for Meditech and ICE requests should be received in the appropriate green bags and general request forms must be accompanied by the appropriate samples. Remove the brown self-adhesive tape to reveal the glued area, and then fold along the perforations so the glued area attaches to the plastic and securely seals the specimen bag. Remove the second brown self-adhesive tape and attach the specimen bag to the top section of the ICE order comms (may be hand written or order comms) request form.

Hard copies of all reports issued by the laboratory include the relevant age and sex related reference ranges.

9. Transportation of Specimens to the Laboratory

GP samples are usually transported using Courier Logistics (a private provider). Hospital samples are delivered either via the air tube system or by hand to the Laboratory Specimen Reception Department.

10. Specimen Reception

All samples arrive at the laboratory via the centralized specimen reception area. The specimen reception area also deals with initial result enquiries for all departments with the exception of Histopathology and Cytology. Specimen Reception contact numbers are as follows:

Results enquiries 01709 427553 (internal 7553)

Any queries regarding Specimen Reception should be directed to the Specimen Reception Manager on any of the above numbers.

11. Additional Tests

Separated blood samples are retained in a refrigerated state. If additional tests are required to be added to samples already in the department then this may be arranged. Any additional requests must be made within 5 days of the sample being taken using either the 'Biochemistry Additional Requesting Form' available on inSite or a Pathology Request Form. ALL patient/ clinician details must be included as detailed above.

If additional tests are required after 5 days please telephone the department with any such requests. Some tests may be affected by a delay in analysis after the sample is taken from the patient, laboratory staff may be able provide the additional testing subject to test stability and storage.

12. Turnaround Times

These are based on the average expected turnaround time from receipt of sample to time of report. We aim to get 90% of results available in this stated time but there may be exceptions with samples processed over extended bank holiday periods and tests performed at specialist referral laboratories.

It is important to note that results are often available on ICE before the times quoted and in addition any urgent results that may affect the clinical management of the patient are telephoned by Biomedical Scientific staff as soon as available.

Should reporting the result from a sample be significantly delayed and thus compromise patient care, for example through equipment failure, supply problems or contamination issues, the user will be contacted, informed of the reasons and advised of a proposed date for resolution of the problem. An internal incident/internal investigation by CAPA and Datix reporting will be performed if appropriate.

13. Measurement of Uncertainty

The laboratory makes regular estimates of measurement uncertainty for all analytes. Please contact the laboratory if further information is required.

14. Referred Work

The department holds a list of test repertoire and accreditation status of all laboratories to which work is routinely referred. This list is available on request. Referral work is primarily sent to NGH:

Immunology Department
Northern General Hospital
Herries Road
Sheffield S5 7AU
Tel: 0114 271 5552

Immunodeficiency vaccine response testing:

Manchester Medical microbiology partnership
Manchester Royal Infirmary
Central Manchester hospitals trust
Oxford Road
Manchester
M139WL
Tel: 0161 276 6757

Specialised Neurology Testing:

Immunology Department
Churchill Hospital
Old Road
Headington
Oxford
OX3 7LJ
Tel: 01865 225995

15. Immunology Tests Performed In-House

If no age specific reference range is quoted, it is presumed to be the same as the adult range.

Age related reference ranges are quoted on all reports.

Analyte	Reference Ranges (and source)	Estimated whole blood volume required	Turnaround Times/Comments	Patient preparation/factors affecting test/clinical decision values/special precautions
A1AT (Alpha 1 antitrypsin)	Birth 0.9 – 2.2 g/L To 6 months 0.8 - 1.8 g/L To 1 year 1.1 – 2.0 g/L To 5 years 1.1 – 2.2 g/L To 10 years 1.4 – 2.3 g/L To 15 years 1.2 – 2.0 g/L Adult 1.1 – 2.1 g/L PRU (Protein Reference Units) Handbook of Clinical Immunochemistry, Ninth Edition 2007	250 µL for quantitation, 500 µL if phenotyping also required	2 days plus further 3 weeks for phenotype	
Autoimmune Profile (includes ANA only)	Negative	500 µL	Please request specifically if LKS (multi tissue block) also required. TAT 3 days if negative, a further 7 days if reflex testing required (this may include one or more of the following: centromere B, ENA screen, ENA typing, DNA, crithidia, LKS, M2)	

Analyte	Reference Ranges (and source)	Estimated whole blood volume required	Turnaround Times/Comments	Patient preparation/factors affecting test/clinical decision values/special precautions
B2M (Beta 2 microglobulin)	Serum 1.2 – 2.4 mg/L PRU (Protein Reference Units) Handbook of Clinical Immunochemistry, Ninth Edition 2007	250 µL	1 week	
Analyte	Reference Ranges (and source)	Estimated whole blood volume required	Turnaround Times/Comments	Patient preparation/factors affecting test/clinical decision values/special precautions
Ceruloplasmin	0.20 – 0.60 g/L PRU (Protein Reference Units) Handbook of Clinical Immunochemistry, Ninth Edition 2007	250 µL	2 days	

Analyte	Reference Ranges (and source)	Estimated whole blood volume required	Turnaround Times/Comments	Patient preparation/factors affecting test/clinical decision values/special precautions
Coeliac Screen Includes TTG (frontline test) and subsequent anti-endomysial IgA antibodies/ IgG anti tTG antibodies as required	IgA anti TTG antibodies: < 10 U/mL IgA anti endomysial antibodies: Negative (IgA anti endomysial antibodies only performed if tTG > 7.0 u/ml. Total IgA assayed on low TTG results). Method insert	500 µL	1 week	A serological test for coeliac disease is only accurate if a gluten-containing diet has been followed for at least 6 weeks prior to the test. A gluten-containing diet = some gluten consumed in more than one meal every day. Ref: Coeliac disease: recognition, assessment and management (2015) NICE guideline NG20
Complement C3, C4 levels	C3 0.75-1.65 g/L C4 0.14-0.54 g/L PRU (Protein Reference Units) Handbook of Clinical Immunochemistry, Ninth Edition 2007	250 µL	2 days	

Analyte	Reference Ranges (and source)	Estimated whole blood volume required	Turnaround Times/Comments	Patient preparation/factors affecting test/clinical decision values/special precautions
Cryoglobulins	None detected	Warm sample required. Please contact laboratory for further advice before venepuncture. Minimum 2mls in adult serum bottle.	2 weeks. Collected at 37°C and taken to laboratory as soon as possible in thermos flask available from lab.OPD and GP patients taken at RDGH phlebotomy preferably. TAT 1 week for screen, 2 weeks for full analysis. Screen performed in house. Positive screen sent to Immunology, NGH, for further analysis.	Contact lab for minimum volumes and sample type required if necessary. Pre warm sample tubes before phlebotomy
DsDNA	< 20 U/mL Method insert	200 µL Any positive results confirmed by crithidia lucillae assay. Crithidia is not a routinely requestable test.	3 days plus further 1 week for crithidia	
ENA screen includes Sm, RNP, Ro, La, Jo1, Scl70 (extractable nuclear antigen antibodies)	Negative Typed if screen positive	250 µL	2 days for screen plus up to further 2 weeks for typing	
GBM (glomerular basement membrane antibody)	< 20 U/ml	200 µL	Next working day	

Analyte	Reference Ranges (and source)	Estimated whole blood volume required	Turnaround Times/Comments	Patient preparation/factors affecting test/clinical decision values/special precautions	
Immunoglobulins	IgG	300 µL Note serum only (Fibrinogen band appears on electrophoresis otherwise)	1 Day		
	Ref Range g/L				
	< 2 weeks				5.0 – 17.0
	2 to 6 weeks				3.9 – 13.0
	6 to 12 weeks				2.1 – 7.7
	3 to 6 months				2.4 – 8.8
	6 to 9 months				3.0 – 9.0
	9 to 12 months				3.0 – 10.9
	1 to 2 years				3.1 – 13.8
	2 to 3 years				3.7 – 15.8
	3 to 6 years				4.9 – 16.1
	6 to 15 years				5.4 – 16.1
	over 15				6.0 – 16.0
	IgA				
	< 2 weeks				0.01 – 0.08
	2 to 6 weeks				0.02 – 0.15
	6 to 12 weeks				0.05 – 0.4
	3 to 6 months				0.10 – 0.5
	6 to 9 months				0.15 – 0.7
	9 to 12 months				0.20 – 0.7
1 to 2 years	0.30 – 1.2				
2 to 3 years	0.30 – 1.3				
3 to 6 years	0.40 – 2.0				
6 to 9 years	0.50 – 2.4				
9 to 12 years	0.70 – 2.5				
12 to 15 years	0.80 – 2.8				
15 to 45 years	0.80 – 2.8				
> 45 years	0.80 – 4.0				

Analyte	Reference Ranges (and source)	Estimated whole blood volume required	Turnaround Times/Comments	Patient preparation/factors affecting test/clinical decision values/special precautions																												
	<p>IgM</p> <table border="0"> <tr><td>< 2 weeks</td><td>0.05 – 0.2</td></tr> <tr><td>2 to 6 weeks</td><td>0.08 – 0.4</td></tr> <tr><td>6 to 12 weeks</td><td>0.15 – 0.7</td></tr> <tr><td>3 to 6 months</td><td>0.20 – 1.0</td></tr> <tr><td>6 to 9 months</td><td>0.40 – 1.6</td></tr> <tr><td>9 to 12 months</td><td>0.60 – 2.1</td></tr> <tr><td>1 to 2 years</td><td>0.50 – 2.2</td></tr> <tr><td>2 to 3 years</td><td>0.50 – 2.2</td></tr> <tr><td>3 to 6 years</td><td>0.50 – 2.0</td></tr> <tr><td>6 to 9 years</td><td>0.50 – 1.8</td></tr> <tr><td>9 to 12 years</td><td>0.50 – 1.8</td></tr> <tr><td>12 to 15 years</td><td>0.50 – 1.9</td></tr> <tr><td>15 to 45 years</td><td>0.50 – 1.9</td></tr> <tr><td>> 45 years</td><td>0.50 – 2.0</td></tr> </table> <p>PRU (Protein Reference Units) Handbook of Clinical Immunochemistry, Ninth Edition 2007</p>	< 2 weeks	0.05 – 0.2	2 to 6 weeks	0.08 – 0.4	6 to 12 weeks	0.15 – 0.7	3 to 6 months	0.20 – 1.0	6 to 9 months	0.40 – 1.6	9 to 12 months	0.60 – 2.1	1 to 2 years	0.50 – 2.2	2 to 3 years	0.50 – 2.2	3 to 6 years	0.50 – 2.0	6 to 9 years	0.50 – 1.8	9 to 12 years	0.50 – 1.8	12 to 15 years	0.50 – 1.9	15 to 45 years	0.50 – 1.9	> 45 years	0.50 – 2.0	<p>300 µL</p> <p>Note serum only (Fibrinogen band appears on electrophoresis otherwise)</p>	3 days	
< 2 weeks	0.05 – 0.2																															
2 to 6 weeks	0.08 – 0.4																															
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15 to 45 years	0.50 – 1.9																															
> 45 years	0.50 – 2.0																															
IgG Aspergillus precipitins	<p>< 25 mg/L</p> <p>Page <i>et al</i> (2018) "Receiver operating characteristic curve analysis of four Aspergillus-specific IgG assays for the diagnosis of chronic pulmonary aspergillosis". Diagnostic Microbiology and Infectious Disease.</p>	500 µL	1 weeks																													

Analyte	Reference Ranges (and source)	Estimated whole blood volume required	Turnaround Times/Comments	Patient preparation/factors affecting test/clinical decision values/special precautions
Total and Specific IgE Specify all allergens required	Total IgE Newborn <5 kU/L 3 months <11 kU/L 1 year <29 kU/L 5 years <52 kU/L 10 years <63 kU/L 15 years <75 kU/L Adult <81 kU/L Specific IgE <0.35 kAU/L PRU (Protein Reference Units) Handbook of Clinical Immunochemistry, Ninth Edition 2007	100 µL per allergen requested (plus 200µl for instrument dead volume).	1 week	When requesting ask for total IgE and make a note on the form of all allergens required. If small volume sample specify allergens required in order of importance.