

# PATHOLOGY

## PATHOLOGY DIRECTORATE User Guide

### Blackburn

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The Pathology Directorate has laboratories at two sites; Royal Blackburn Hospital and Burnley General Hospital. It includes all the major disciplines with the exception of Virology and Immunology, which are centralised at Preston.

### **Clinical Services Supported by Pathology**

Population served is about 515,000 in East Lancashire. Services are provided to general surgery/urology, ENT, anaesthetics, orthopaedics, A/E, cardiology, intensive care, oral surgery, ophthalmology, obstetrics and gynaecology, radiology, general medicine / rheumatology / GU medicine, dermatology, paediatrics, psychiatry, outpatients and all general practitioners.

Other hospitals served include, Rossendale, Accrington Victoria, Pendle Community and Calderstones.

**Location**     [Return to Index](#)

Pathology is located on Level 0 in Royal Blackburn Hospital and includes the following disciplines, with the exception of Virology and Immunology, which are centralised at Preston.

**BLOOD SCIENCES** (Biochemistry/Haematology/Transfusion)

**CELLULAR PATHOLOGY** (Histology, Cytology and Mortuary)

**MICROBIOLOGY**

### **Address**

Pathology  
Royal Blackburn Hospital,  
Haslingden Road,  
Blackburn,  
Lancashire,  
BB2 3HH

## **Access**

During the hours of 8:50 to 17:00 Monday to Friday and Saturday 9:00 to 12:00 the Pathology Reception is open to visitors. Outside these hours the outer Pathology doors will be open to Hospital staff for collection of blood for transfusion from the Blood bank situated in the Reception area waiting room. At all times, only cardholders or escorted persons will be allowed access to the laboratory areas.

Out patients do not attend Pathology for any blood sampling. Venepunctures are carried out in the outpatients suite.

Patients may need to attend Pathology reception to drop off semen samples for andrology. Patients will be issued with details by arrangement.

## **Laboratory Opening Hours**      [Return to Index](#)

### **Biochemistry and Haematology/BTS (Blood Sciences)**

The department provides a full 24 hour, 365 day/year, ROUTINE diagnostic service (including week-ends and all statutory holidays) All samples, which are collected, will be analysed for the common tests AS SOON AS POSSIBLE on arrival at the Laboratory, irrespective of the time of day or night. Core hours for Blood Sciences are 9am to 5pm. Please note that normally only two members of staff are present outside core hours.

### **Microbiology**

Monday to Friday	08.50 - 17.00 hrs
Saturday	09.00 - 12.30 hrs
Sunday	Closed for routine work

The Microbiology Department is open on Saturday mornings with reduced staff for essential investigations only, and specimens, which ideally should be received in the laboratory by 10.30 hrs.

Arrangements for Bank Holiday cover will be circulated to wards and departments prior to the holiday.

### **Histology**

Monday to Friday	08.00 - 17.00 hrs
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No out of hours cover is available

Frozen sections for urgent processing is by prior arrangement with the Department.

**Useful Telephone Numbers**

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Pathology Clinical Director      Dr J Kendra      01282 294316

**Pathology Directorate**      Add 01254 73 for external & 8 for internal

**Medical Staff/Scientific Staff:**

Top Grade Biochemist	Dr E J Hindle	4153
Top Grade Biochemist	Mr T Dyer	4362
Consultant Haematologist	Dr D A Newsome	4379
Consultant Haematologist	Dr Chernigoy	01282 29 4316 (Burnley)
Staff Grade Haematologist	Dr N Rotherham	
Consultant Histopathologists	Dr A Mene	5141
“	Dr R Prescott	4441
“	Dr S Kumar	5706
	Dr K Brelsford	4372
	Dr A Aslam	
Consultant Microbiologist	Dr R White	5904
Consultant Microbiologist	Dr N Rotowa	4376
Consultant Microbiologist	Dr K Burch	4294
Pathology Directorate Manager:	Mr J Cottam	4106
Blood Sciences Manager	Mr J Lord	4145
Microbiology Manager	Mr. M Gray	4350
Histology Manager	Mr D Squires	4162
Pathology Quality Manager	Mr S Beckett	4146 (01282 475167)
Pathology Safety Officer	Mr K Watson	4160
Transfusion Practitioner	Mrs L Mannion	4379

**Chief Biomedical Scientist Staff**

Chief BMS Biochemistry	Mr I McAuslane	4514
Chief BMS Haematology/BTS	tba	
Chief BMS Microbiology	Mr. I Byrom	4173
Chief BMS Histology	tba	
Chief BMS Cytology	Mr. G Inward	4387

**Infection Control Team**

Beverley Aspin	4108
Vanessa Morris	4639
Marion Willcocks	4701

**Administration**

Directorate Secretary	Miss A Wilkinson	4146
Laboratory Secretaries	Mrs R Maynard	4147
	Miss J Barnes	2957
	Mrs J Bromiley	4725

<b>Laboratory Office</b>	Reception/Enq	4144.
	Result Enquiries	4144
	GP Supplies/Enqs	2974.

**Request Forms and Specimen Containers**[Return to Index](#)

To ensure rapid return to originating source, request forms and samples containers must be fully identified (unlabelled samples will not be accepted; unlabelled or inadequately labelled samples for cross match or group and save cannot be accepted).

**Please identify forms using:**

**Hospital or NHS number - mandatory**  
**Forename and Surname - mandatory**  
**Date of Birth - mandatory**  
**Gender**  
**Location**  
**Clinical Details**  
**Address where possible**  
**Consultant and requestors name or pager number**

**Please identify samples using:**

**Forename and Surname - mandatory**  
**Date of Birth - mandatory**  
**Location**  
**Time and date**

**Confirm details with the patient, wristbands etc and conduct the entire process at the patient's side.**

For patients admitted through the Accident and Emergency Department, the request form should identify the projected ward/location if this is known.

The requesting Medical Officer must sign the form legibly and check that all the information is correct. This is essential where results require rapid notification. Consultant's name (initials) and a contact number should be identifiable. Also the patient status should be shown (NHS, Private)

For Haematology and Biochemistry a combined request form with tick boxes is in use. In order to ensure the efficient use of resources, **please do not be tempted to request indiscriminately.**

Microbiology requires separate request forms for each specimen.

Histology require a separate form with each patient.

The type and volume of sample required for each test is shown in the departmental sections.

### **Phlebotomy Service**

A phlebotomy service is available at RBH (Monday to Saturday). On Saturday mornings this service is limited. Please ensure that request forms for blood collections on Saturdays are written out on Fridays and available for the Phlebotomist's use early on Saturday morning.

If the Phlebotomist is unable to attend, notice will usually be given. In these circumstances, and at all other times, ward staff must collect the blood samples and arrange their delivery to Pathology.

### **Specimen Transport to Pathology**

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The Airtube system can be used for transporting samples to the Main Specimen reception in Pathology from within the Hospital. Do not use for any glass containers.

### **PATHOLOGY AIRTUBE POLICY**

- All samples must be in a sealed specimen bag attached to a completed request form before being **placed in the carriers.**
- Carriers must be contain bubble wrap and be closed securely at both ends. ( Bubble wrap available from Pathology)
- The system is available for Biochemistry and Haematology and Microbiology samples 24hrs a day 7 days a week.
- During the normal working day, the current arrangements for delivery by hand should be used for bulky/ heavy samples such as 24 hour urine

collections and patient delivery for semen samples for Histology and Histology specimens in general.

- Only one set of Blood Cultures (not glass) should be placed in a carrier at one time.

The following must **NOT** be sent by air tube:

ANY LEAKING SAMPLE  
BLOOD GAS SAMPLES  
ITEMS OVER 1.5KG  
ANY SHARPS  
ANY HISTOLOGY SAMPLES IN FORMALIN  
CYTOLOGY SAMPLES.

- Due to the pressure and vibration in the airtube, it is important to ensure that tops on bottles are tightened correctly in order that samples do not leak.
- It is important that samples are batched where possible to reduce the traffic of carriers in the Pathology Reception.
- For urgent work, during the day time (9am – 5pm), apart from, AE, ICU, MAU, SHDU, NICU the pathology department concerned should be telephoned prior to sending any samples. At all other times, please telephone the laboratory, prior to sending **any** urgent work.

### **External Transport**

AVH - Morning and afternoon collections in central pickup, OPD  
During times outside the routine schedule it is the responsibility of the ward/department to arrange delivery to RBH Laboratory Reception.

### **Saturday Mornings**

<b>Time</b>	<b>Location /Departure</b>	<b>Destination</b>
10.00	AVH	RBH

### **Emergency Specimen/Requests (During Normal Hours)**

It is the responsibility of wards to ensure that urgent work is delivered promptly and is identified appropriately. It would be prudent to telephone, alerting the relevant Department.

## **EXTERNAL SPECIMEN/MAIL COLLECTIONS FROM GPS**

The following times may vary according to traffic conditions and availability of specimens (i.e. at some collection points we may be requested to wait a few minutes). Surgeries with additional specimen collections please see 'GP Surgery Specimen Collection' timetable for approximate times of second pickup.

### **Blackburn and Darwen**

<b>Location</b>	<b>Arrival time</b>	<b>Departure time</b>
Bentham Road	10.35	10.40
Redlam Surgery	10.45	10.50
Doctors' Surgery Preston New Road	10.52	10.55
St George's Surgery Preston New Road	11.00	11.02
Larkhill HC	11.05	11.20
Little Harwood HC	11.25	11.30
Audley HC	11.38	11.45
BRI Path Lab	11.52	11.57
Darwen HC	12.10	12.15
Roman Road HC	12.22	12.25
Montague HC	12.35	12.40
Witton Surgery Preston Old Road	12.45	12.48
BRI Path Lab	12.55	

### **Hyndburn and Ribble Valley**

<b>Location</b>	<b>Arrival time</b>	<b>Departure time</b>
Oswaldtwistle HC	09.45	09.50
Peel House Medical Centre	10.00	10.02
AVH Clinic	10.00	10.05
AVH Communicare Office	10.10	10.12
Clayton Le Moors Med. Centre	10.15	10.20
Great Harwood HC	10.45	11.00
Clitheroe Hospital	11.15	11.20
Clitheroe HC	11.25	11.30
Whalley Medical Centre	11.45	11.50
BRI Path Lab	12.20	-
Longridge HC	15.20	15.25
Longridge Community Hospital	15.30	15.40
Clitheroe Hospital	15.45	15.55
BRI Path Lab	16.15	16.20



## GP Specimen Collection Run

Arrival (approx)

Dr Derar	37 Perry St Darwen	10.15
Dr Alam	42 Railway Rd Darwen	10.15
Dr Ahmed	Bridge End Surgery Darwen	10.20
Dr Alam	102 Bolton Rd Darwen	10.25
Dr Jagadesham	153 Blackburn Rd Darwen	10.30
Dr Joshi	461 Bolton Rd Blackburn	10.35
Dr Nataraj	431 Bolton Rd Blackburn	10.35
Dr Rakshit	133 Kings Rd Blackburn	10.40
Dr Din	696 Preston Old Rd Blackburn	10.40
Dr Gebbie	513 Preston Old Rd Blackburn	10.45
Dr Gunn	29 Preston Old Rd Blackburn	10.50
Redlam Surg	62 Redlam Blackburn	10.50
Dr Siddique	54 Preston New Rd Blackburn	10.55
Dr Pollock	46a Preston New Rd Blackburn	10.55
Dr Maiti	53 James St Blackburn	11.00
Dr Alam	3 Lime St Blackburn	11.00
Dr Gebbie	293 Preston New Rd Blackburn	11.10
Beardwood Hosp	Preston New Rd	11.20
Dr Patel	Brookhouse Med Centre	11.35
Dr Rowland	Bangor Resource Centre	11.40
Dr Timson	367 Whalley New Rd	11.45
Dr Phillips	790 Whalley New Rd Blackburn	11.55
Dr Bhattacharjee	85 Accrington Rd	12.00
Dr Rao	2-4 Lincoln Close Blackburn	12.15
Dr Misra	1a Pritchard Street Blackburn	12.25

Specimens returned to RBH at approx 12.30

Dr Manjooran	296 Union Rd Osw	12.45
Dr Ojha	Kusum Med Centre Osw	12.45
Dr Bhat	Higher Heys Surgery Osw	12.50
Dr Karim	Richmond Med Centre Acc	12.55
Dr Kundu	257 Blackburn Rd Acc	13.05
Dr Manjooran	341 Blackburn Rd Acc	13.10
Dr Ojha	363 Blackburn Rd Acc	13.15
Dr Nagpal	Wm Hopwood Street Blackburn	13.25
Dr Duong	216 Pringle St Blackburn	13.30
Dr Gupta	106 Infirmary St Blackburn	13.45

Specimens returned to RBH at approximately 14.15

Dr Murdoch	Shadsworth Surgery Blackburn	14.50
Dr Murdoch	Rhyddings Surgery Oswaldtwistle	15.00
Dr Dixon	154 Blackburn Rd Accrington	15.05
Peel House M C	Avenue Parade Accrington	15.10
Dr Kapenda	60 Abbey St Accrington	15.10
Dr Joseph	158 Dill Hall Ln Accrington	15.15
Dr Karim	47 Whalley Rd Clayton-le-Moors	15.20
Dr Ward	Clayton M C Clayton-le-Moors	15.25
Dr Valluri	32 High St Rishton	15.30
Dr Hancock	High Street Rishton	15.30
Dr M Ahmed	153 St Hubert's Road Gt Harwood	15.35
Gt Harwood HC	Water Street Great Harwood	15.40
Clitheroe H C	Railway View Clitheroe	16.05
Whalley H C	King St Whalley	16.15
Little Harwood H C	Plane Tree Rd Little Harwood	16.45
Audley H C	Longton Cl. Blackburn	17.00
Larkhill H C	Mount Pleasant Blackburn	17.05
Montague H C	Oakenhurst Rd Blackburn	17.20
Beardwood Hospital	Preston New Rd Blackburn	17.30
Witton Surgery	Preston Old Rd Blackburn	17.40
Bentham Rd H C	Bentham Rd Blackburn	17.50
Darwen H C	Union St Darwen	18.05

Specimens delivered to RBH at approximately 18.35

## **ARRANGEMENTS FOR LABORATORY INVESTIGATIONS OUTSIDE CORE TIME**

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### **Biochemistry and Haematology/BTS (Blood Sciences)**

These laboratories function as a combined department. A service operates 24 hrs/day, 365 days/year, and all samples will be analyzed for the common tests AS SOON AS POSSIBLE on arrival at the Laboratory, irrespective of the time. The relevant section should be contacted for life threatening situations only by the following methods

Biochemistry - Page	#6 308
Haematology/BTS	7 350

Do not try to contact by using telephone extension numbers. Please note that only two members of staff (one for each department) are present out of core hours.

### **Microbiology**

'On Call' arrangements are conventional. ALL requests outside the normal core time MUST be preceded by contacting the BMS 'on call' for Microbiology in the following way

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The range of tests provided out of hours includes –

- 1 . CSF examination in suspected cases of CNS infection.
2. Sputum microscopy for acid fast bacilli when open pulmonary TB is suspected.
3. Microscopy and culture of urine, pus, body fluids etc. In many instances these can await prompt examination on the following working day. However, microscopy may yield useful information and setting up the cultures, especially before midnight, can lead to earlier results being available and may be indicated in severe infections. Ward use of urine dipsticks which include nitrite and leucocyte esterase reagents usually provide the same information as urine microscopy.

## **Packaging and Transport of Specimens**

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All specimens, including emergency specimens must be transported in the approved manner to conform to Health and Safety requirements (ie in sealable plastic bags). Caps/lids on specimen containers must be secure (please see separate document).

When emergency samples are transported out of hours they must be sealed in the polythene sealable bag attached to the request form, and available from the Lab Office. Specimens, which are not packed correctly, will not be analysed.

## **Health and Safety**

Biological specimens are a potential hazard to porters, laboratory staff and yourself. Please observe the following rules, and those above, relating to packaging and transport.

## **High Risk Samples**

These are defined as specimens taken from cases of: -

1. Confirmed or suspected Hepatitis B infection of HBsAg carriers.
2. Confirmed or suspected HIV infection.
3. Infection or suspected infective disease of the liver.
4. Confirmed or suspected enteric fever.
5. Confirmed or suspected TB.
6. Any other confirmed or suspected high risk disease.

All specimens from known or suspected cases must be sealed within the plastic sample bag or the smaller compartment of a plastic minigrip bag and the request form (if not the attached type) inserted within the larger compartment.

A "Danger of Infection" label must be placed on the request form, specimen and plastic bag. Pins, staples, etc must not be used to seal bags. Please indicate the nature of the risk on the request form. To retain confidentiality, yet ensure safe handling and analysis, the phrase "Blood Borne Virus Infection" can be used for proven or suspected cases of HIV or Hepatitis B or C infection.

## **Viral Haemorrhagic Fever**

When the Diagnosis is suspected e.g. fever in patient from Africa within previous 3 weeks. DO NOT collect any specimens before contacting a Consultant Microbiologist.

## **Laboratory Reports**

Paper reports will be delivered to their destination as soon as they are available. In general, they will coincide with portering schedules. (See Page 4) Electronic reports will be available once authorised through the Ice Ward system.

Please keep telephone enquiries to a minimum as they interrupt workflow, often delaying the result you are seeking. Always have the patient's Hospital Number available when making an enquiry. If results are required urgently, it is better to inform the laboratory and indicate so on the request form. A 'please phone' instruction does not convey the response time required.

Enquiries on other than the current day should be made to-

Phone numbers TBA  
Haematology/Biochemistry  
Microbiology less than two days old  
Microbiology over two days

Biochemistry is part of the Pathology Department located on Level 0 RBH. A comprehensive Clinical Biochemistry service is offered to all Hospitals and General Practitioners in the district. As well as centralised analytical service equipment, the Laboratory will also oversee the operation of ward based equipment.

### Telephone

01254 73 (external) 8 (internal)

Consultant (part time) Biochemist Dr E J Hindle	4153
Consultant Biochemist Mr. T Dyer	4362
Blood Sciences Manager Mr J Lord	4145
Chief BMS Mr I McAuslane	4514
General Enquiries (Main Laboratory)	4156

Outside core hours

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### **Request form and specimen labelling**

A test request form signed by a qualified medical officer must accompany every specimen. To ensure rapid return to originating source, request forms and sample containers must be fully identified (unlabelled samples will not be accepted; unlabelled or inadequately labelled samples for cross match or group and save cannot be accepted). [See Page 5.](#)

### **Routine Requests**

A combined Pathology request form is used which contains information about the common groups of tests and sampling requirements. In order to ensure efficient use of resources please do not request indiscriminately.

### **Paediatric Specimens**

A range of special paediatric tubes, with and without preservative, are available. When particularly small samples are obtained the request for analysis should indicate guidance on priorities.

### **Available Tests**

The volume, type of sample and special requirements is indicated at the back of this document (separate copies of which are available from the Laboratory Reception).

### **Reference Ranges**

Reference ranges are normally printed alongside every reported result. Additionally, a summary of the reference ranges used in this Department is available from the Laboratory Office and is also included at the back of this document.

### **Hormone Assays**

Results for TFTs and most reproductive hormones are normally available within one day of receipt. Other polypeptide and steroid hormones are analyzed less frequently; the uncommon ones may take slightly longer. Please refer to 'Turnaround' document at the back of this document.

### **Therapeutic Drug Monitoring**

A service is provided for the monitoring of serum concentrations of a variety of drugs. If a drug assay is required the following information is useful:-

- a) Prescribed drug of interest (and other co-administered drugs).
- b) Time of last dose.
- c) Duration of therapy.
- d) Reason for request.

The Department offers a routine service for Lithium, Theophylline, Phenytoin, Phenobarbitone, Carbamazepine, Valproic acid, Digoxin, Amiodarone , Gentamicin and Vancomycin amongst others.

### **Drugs of Abuse**

The Laboratory offers a comprehensive screen for drugs of abuse in known or suspected abusers and those on detoxification programmes. A random sample of urine is required (approximately 50mls, do not use boric acid preservatives). Information about likely exposure, where known, is useful. The initial screen includes opiates, methadone, amphetamines and benzodiazepines. Cannabis and cocaine must be requested specifically. For methadone detoxification, request opiates and methadone only.

This is a screening test only. Positives require confirmation and negatives do not exclude the presence of small quantities of drugs.

## **Drug Analysis in Overdose Cases**

The department offers analyses of various drugs in patients where overdose is suspected. The most common request is for paracetamol and salicylate. Since the decision to treat is based on the paracetamol level at approximately 4 hours post ingestion, for correct interpretation it is advisable not to measure paracetamol before this period has elapsed. It is not possible to distinguish between absent and low levels of paracetamol. This should be noted in the case of a late presenting overdose.

In some circumstances, it may be appropriate to request the following: Carboxyhaemoglobin, iron, lithium, theophylline, phenytoin and blood alcohol.

The Poisons Reference Centre at Guy's will be able to advise in the case of ingestion of unusual toxic materials or our own laboratory may also be able to offer some information in terms of local expertise.

## **Tests for Medico-Legal Purposes**

Ethanol : The department does not analyze blood alcohol levels for legal purposes.

## **Reporting of results**

All routine Biochemistry analyses have a fast turn round time, in normal circumstances. (Please refer the 'turnaround' section at the back of this document.) These tests are generally on those samples collected by the phlebotomists. For some of the samples collected first thing in the morning, reports will arrive back on the wards soon after lunch, the remainder arriving late afternoon/early evening.

Prompt and safe delivery of reports to source depends on many factors. If you experience problems or excessive delays, please contact the Laboratory reception so that the problem may be investigated. Results may also be accessed on the ward terminals once they are authorised.

## **Emergency Results**

These are authorised as they become available and can then be viewed on the ward terminals. Results will be telephoned to the requesting doctor, ward or unit if they are considered life threatening.

Routine requests whose results are considered by laboratory staff to be of urgent clinical significance will also be telephoned to an appropriate source.



## **Erroneous Results**

Whilst we will always strive to avoid reporting erroneous results, it is inevitable that from time to time this will occur, because of the complexity of many of our operations and the vast amount of data that is generated. If for any reason results are not consistent with the clinical state of the patient or are at variance with previously reported results, please alert and discuss with a senior member of the department

## **Interpretation of Results**

Reference ranges are displayed together with the result on every report. It is important to always refer to ranges, which apply in this laboratory and also note that on statistical grounds 5% of the 'normal' population will have results, which lie outside the reference range.

A variety of factors such as age, sex, race, exercise, diurnal rhythm and drugs can affect biochemical results.

The method of collection and storage (e.g. venous stasis on calcium, delayed separation of serum on potassium), can also affect the interpretation.

Analytical and biological variation must always be taken into account, especially when determining whether a change over time is significant.

Changes in results are caused by analytical imprecision, within subject variation as well as by deterioration or amelioration of the patient's condition. This average 'critical difference' (i.e. a significant change) has been calculated for many commonly requested analytes e.g.:-

Sodium	3%	Urea	30%
Potassium	14%	Creatinine	14%
Calcium	5%	Amylase	30%
Glucose (F)	15%	Cholesterol	19%
Albumin	8%		

Drugs can influence tests in two ways: -

- a) Analytical interference: - a chemical interference with a method used to analyse the specimen causing falsely elevated or decreased results.
- b) Biological affect: - drugs often have secondary biological affects in addition to their desired therapeutic affect.

Senior staff may be able to help in result interpretation in such circumstances.

## Equipment outside the Laboratory

The Biochemistry Department will monitor ward based analytical equipment. This includes ward-based Glucose Meters, which are used on most medical and surgical wards, A/E etc. The Laboratory makes regular checks on the correct functioning of the meters and quality control material is supplied to the relevant wards for use as directed. Used correctly, they are capable of providing very reliable results.

## Blood gas analysers are on ICU, NICU, MAU, A/E, CDS and C8

At the start of each new medical house, training is offered in the use of these machines. It is vital that junior medical staff undertake this training, as there could be serious medico-legal consequences if this has not occurred. The Laboratory performs regular checks on these instruments and undertakes quality control. Good housekeeping practice on the part of the user is however, still essential.

Particular care **must** be taken in the use of these instruments so that valid results are obtained. In the case of paediatric samples **special care MUST be taken in the collection and MIXING of capillary specimens** or clots will deposit on the electrode chamber. A metal "flea" must be inserted and the sample mixed thoroughly with a magnet. (Clot filters are available and should be used to reduce this risk.)

## REFERRAL LABORATORIES

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Below is a list of those laboratories routinely used by Biochemistry for referral purposes:

<u>Laboratory</u>	<u>Address</u>	<u>Accredited By</u>	<u>Certificate No</u>
Hope, Manchester	Salford Hospitals, NHS Trust. Hope Hospital Department of Clinical Biochemistry, Stott Lane, Salford, M68HD	CPA	0253
MRI, Manchester	Central Manchester and Manchester Children's University Hospitals, Manchester Royal Infirmary Department of Clinical Biochemistry, Oxford Rd, Manchester, M13 9WL	CPA	0865
Pendlebury, Manchester	Royal Manchester Children's Hospital, Department of Clinical Biochemistry, Hospital Rd, Pendlebury, Manchester, M27 4HA	CPA	0586
SAS Vit D Lab, Manchester	S.A.S. VITAMIN D LABORATORY, University Department of Medicine, Manchester Royal Infirmary, Oxford Rd, Manchester, M13 9WL	Lloyds Register ISO 9000	LRQ 4001542

Willink, Manchester	Willink Laboratory, Royal Manchester Childrens Hospital, Pendlebury, Manchester, M27 4HA	CPA (awaiting accreditation)	2766
Wythenshawe, Manchester	Department of Clinical Chemistry, Wythenshawe Hospital, Southmoor Road, Manchester, M23 9LT	CPA ISO 15189	0344

## BLOOD TRANSFUSION – Blood Sciences

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Blood transfusion is combined in Bloodsciences, with Haematology and Biochemistry and located on Level 0 at RBH.

01254 73 (external) 8 (internal)

Telephone                      1083 (687209)  
Main Lab                        4529 (687209)

Outside core hours        Bleep 350

### Requesting Procedure

Use red labelled BTS sample tubes.

Complete all the patient details on the special blood transfusion request form by ballpoint pen. **Blood transfusion fatalities are most often caused by clerical error** - double check that the information on the request form and the blood tube are complete and correct. If the data supplied is incomplete, Blood Transfusion staff cannot accept the blood specimen. **USE ONLY BLOOD TRANSFUSION TUBES.**

The patient's name, DOB, Hospital number should be on the sample tube and form. Pre-printed labels must not be used on the form or sample.

### Timing of Requests

Before Blood Transfusion staff can match blood for your patients they must first check the blood group and carry out an antibody screen. They may involve obtaining the correct blood group pack from the Regional Blood Transfusion Centre, therefore, please give at least 24 hours notice before the blood is needed, especially if atypical blood group antibodies are involved.

Requests for emergency issues of blood must be made by **telephone (4178/4529)** by the medical officer. Blood is issued for definite use only.

An up to date haemoglobin result may determine the number of units required, if any.

O Negative uncrossmatched Flying Squad is available for emergency use:

1. In the blood bank in Pathology Reception Level 0 which will be accessible with key pad access 24 hours everyday.
2. For Obs/Gynae use only. In blood bank situated in Obs/Gynae theatre, Level 3. Keypad access.

### **Electronic Issue**

Blood is only issued for definite use. If the patient has been grouped and saved and has no antibodies, group specific blood can be issued in 10 minutes

If the patient has blood group antibodies at least 24hrs notice is required for compatible units to be issued.

Please note: Group and antibody screen and save serum before surgery can considerably reduce the time to supply blood if no blood group antibodies are present. Ideally, out-patients samples could be sent with a request form 7 days before patients are admitted to hospital, or when seen at out-patients by a consultant.

### **What to Request**

#### **Red Cells (Leucocyte depleted)**

Each pack contains approximately 350mls. One donor pack will raise the haemoglobin in an average sized adult by about 1.0g/dl.

### **Blood bank storage**

Due to the matching system in use, blood is not stored in the blood bank fridges but is placed there at time of definite need. This arrangement can only be successful if a group and antibody screen has previously been sent to the Transfusion department. A known blood group and previous negative antibody screen means blood can be made available within 10 – 15 minutes of your request, to be collected from the Blood bank in Pathology Reception Level 0 (keypad access). In cases where multiple packs are issued for urgent use i.e. trauma, these can be issued in a specially insulated transport container for local storage up to 6 hours before transfusion. The Transfusion Department **MUST** be contacted immediately this need is identified.

## **Fresh Frozen Plasma (FFP)**

This product is used to correct blood-clotting disorders. The patient's blood group is required. This product is stored at minus 40 C and requires about 30 minutes to thaw out before use. The volume is about 180 mls per pack and should be transfused as soon as possible after thawing. Clotting study results are usually required before decision on number of units required is taken.

The ward will be informed when the FFP is ready for collection from the Blood bank in Pathology Reception Level 0. (keypad access)

## **Factor VIII and IX**

Freeze-dried product available from the Haematology Department. Some other single or combined clotting factor freeze-dried concentrates may be available from Regional Blood Transfusion Centres. To be announced

NOVO SEVEN – activated Factor VII is available in cases of massive blood replacement. See Trust policy regarding massive blood replacement. After approval for issue by the consultant Haematologist, units will be available from the Blood Transfusion Blood bank in Pathology Reception Level 0 ( Keypad access).

## **Platelet Concentrates**

Available on special request from The Blood Transfusion Centre made through the Blood Transfusion Laboratory.

The patient's blood group is required. During laboratory hours, the request should be made to the Consultant Haematologist who will pass the request to the Blood Transfusion Department. If possible, requests should be made before 10.30am. Out of core hours and at weekends, the request should be made by bleeping the BMS, who will contact the Consultant Haematologist.

Units must be collected directly from the Blood Transfusion department via Pathology Reception Window Level 0, by prior arrangement.

## **Suspected Transfusion Reactions**

All suspected reactions must be reported immediately to the Consultant Haematologist or senior laboratory transfusion staff. See Policy for Transfusion of Blood for Procedure and samples required.

## **Other Components**

Human Albumin solution (NB: patient's blood group is not required) units will be available from the Blood Transfusion Blood bank in Pathology Reception Level 0 ( Keypad access) Level 0, by prior arrangement, on a named basis for individual patients.

### **Miscellaneous Requests**

#### **Ante-natal Serology**

7.5ml Blood Transfusion tube sample together with fully completed Blood Transfusion Department combined form (569).

#### **Tissue Typing/HLA Typing**

7.5 ml blood transfusion tube required for HLA B27 and HLA Class I and II typing, also 10 ml clotted blood required if for tissue or organ transplant together with a Haematology/Biochemistry combined request form.

#### **DNA and Fragile X Testing**

Paediatric samples 5ml EDTA, neonates 1 ml EDTA and adults 10ml EDTA. Specimens posted anytime with a special DNA studies request form. Send to address on reverse of request card.

#### **Chromosome Studies**

5 ml heparin tube clearly labelled can be sent to Pathology Department Office at RBH, together with a fully completed special request card headed 'North West Regional Cytogenetics Service' before 2.30pm Monday to Thursday inclusive, excluding public holidays. Any samples arriving late will be refrigerated overnight at 4 C, but may be too old for testing on arrival at St Mary's Hospital Manchester. Any requests made outside of these hours must be made directly with the Cytogenetics Department at St Mary's Manchester.

#### **Cold Agglutinins**

10ml clotted sample and a 5 ml EDTA (pink) sample. Use a Haematology/Biochemistry combined request form. Normal range time < 1 in 64 at 40C.

### **Direct Coomb's Test**

A 7.5ml EDTA sample together with a fully completed Haematology/Biochemistry combined request form.

### **Kleihauer/Betke (KIB)**

Collect a 7.5ml blood transfusion sample from both cord and mother's blood after delivery and send within 12 hours of collection together with a fully completed Blood Transfusion combined request form. Immunoglobulin Anti-D must be administered within 72 hours of delivery. One dose of 500 IU is suitable for clearance of <4mls of foetal red cells. 250 IU for patients <20 weeks of pregnancy.

### **White Cell Antibodies (Possible Cause of Some Blood Transfusion Reactions)**

10 ml clotted blood and a Haematology/Biochemistry combined request form.

### **Platelet Antibodies (Possible Cause of Blood Transfusion Reaction)**

Contact Blood Transfusion for request form and sample requirements. Samples should arrive in the Laboratory before 12.00hrs Monday to Thursday only, excluding Bank Holidays, for referral to the Blood Transfusion Centre.

## **HAEMATOLOGY – BLOOD SCIENCES**

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Haematology is combined with Biochemistry and Blood Transfusion.

Telephone Enquiries

01254 73 (external) 8 (internal)

Consultant Haematologist

Dr D A Newsome

Dr Chernigoy

84379

01282 29 4316 (Burnley)

Clinical Assistant

Dr Naj Rotheram

84379

FBC and General

Coagulation only  
Outside core hours

Bleep 350

The following investigations are available:-

### **Routine Investigations**

**FBC** Pink EDTA tube

Smaller volumes of blood to a minimum of 2 ml are acceptable but excess EDTA may affect the morphology of cells when a film examination is required.

**ESR** Purple Tube

These samples **must not** be underfilled.

**Reticulocytes** Pink EDTA

Can be done on a FBC sample.

### **Coagulation Investigations**

**Prothrombin Time** 3ml Green tube

Clean venepuncture is important. Ensure thorough mixing. Fill to line.

**APPT only** 3ml Green Tube

Clean venepuncture is required. Fill to line. Ensure thorough mixing. Send to lab as soon as possible.

**Coagulation Screen** 3ml Green Tube

As above but sent to lab immediately.

**FDPs (D Dimer)** As Above for Follow agreed protocol

**Antithrombin III** 3ml Green Tube

**Thrombophilia Screening** 4 x 3ml Green Tube

Patient must not be in an acute phase at time of sample collection or taking anticoagulants.

**Lupus Anticoagulant** 2 x 3ml Green Tube

Patient must not be on anticoagulant at time of sample collection.



**FV Leiden** 3 x 2.7ml EDTA Tubes Discuss with  
Haematology before collection

**Factor Assays** 4 x 3ml Green Tube  
Must arrange with Department

### Haemoglobinopathies

**S Test** Pink EDTA

**G6PD** Pink EDTA

**Hb. Screening** 2.7ml Pink EDTA

**Serum B12 and Folate** Brown Clotted (min 5ml)

**Ferritin** Brown clotted  
(min 5ml)

**Red Cell Folate** Pink EDTA MCV should be  
stated.

**IgE and Rast** Brown clotted (10ml)  
To assist in choice of Rast tests to be performed it is important  
to supply all relevant clinical data

### Miscellaneous Investigations

**HbA1C** Pink EDTA  
Please send separate sample if FBC required.

**LAP** Orange Heparin

**Malarial Parasites** Pink EDTA

Send sample to department as soon as possible after collection

Can be done on FBC sample

**Hams Test** 10ml clotted and Pink EDTA  
Discuss with Consultant Haematologist.

**Osmotic Fragility** 2 x5ml Orange heparin  
 Samples required as soon after collection and not after 3pm.  
 Must not be stored over night. Discuss with Consultant Haem.

**Lymphocyte** 2x 2.7ml EDTA

**Subsets CD4/CDB**

Send to Lab as soon as possible after collection. Do not refrigerate.

**Anticoagulant Therapy**

Follow the Directorate of Medicine protocol –available on all wards

**REFERRAL LABORATORIES** [Return to Index](#)

Below is a list of those laboratories routinely used by Blood Transfusion and Haematology for referral purposes:

<b><u>Laboratory</u></b>	<b><u>Address</u></b>	<b><u>Accredited By</u></b>	<b><u>Certificate No</u></b>
Coag Laboratory, Wythenshawe Hospital	Coagulation Laboratory, Clinical Science Building, Southmoor Rd, Wythenshawe, Manchester, M23 9LT	CPA ISO 15189	0531
Coagulation Dept, MRI	Autolab, Coagulation Dept, Pathology Dept, Manchester Royal Infirmary, Oxford Rd, M13 9WL	CPA	0862
Dept of Haematology, Leeds General Infirmary	Dept of Haematology, Leeds General Infirmary, Great Georges St, Leeds, LS1 3EX	CPA	0060
Dept of Haematology, MRI	Manchester Royal Infirmary Dept of Haematology, Oxford Rd, Manchester, M13 9WL	CPA	0862
Dept of Haematology, North Manchester General Hosp	Dept of Haematology, North Manchester General Hospital, Crumpsall, Manchester, M8 6RB	CPA	0134
Diagnostics Lab, Liverpool School of Hygiene	Diagnostics Laboratory, Liverpool School of Hygiene & Tropical Medicine, Pembroke Place, Liverpool, L3 5QA	Applied for CPA Accreditation	
National Blood Service	Manchester Blood Centre, Plymouth Grove, Manchester, M13 9LL	CPA	1043
Regional Immunology Service, St Mary's Hospital	Regional Immunology Service, St. Mary's Hospital, Hathersage Rd, Manchester, M13 0JH	CPA	1934

**HISTOLOGY AND CYTOLOGY**

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Histology/Cytology is based within Pathology on Level0 RBH.

The departments are staffed between 08:50hrs and 17:00hrs Monday to Friday.

### **Telephone Enquiries**

01254 73 (external) 8 (internal)

Histology	85147
Cytology	84528
Histology Secretaries	82957

### **Consultant Histopathologists**

Dr A Mene	85141
Dr R Prescott	84441
Dr S Kumar	85706
Dr K Bresford	84372
Dr A Aslam	83367
Senior Chief BMS	84162

### **Telephone Enquiries**

Please telephone Histology Secretaries

### **Histology**

#### **Request Forms**

Relevant legible clinical details and clinical impression or differential diagnosis are required for the accurate interpretation of the histological findings. Insufficient information may lead to delayed reporting, performing unnecessary expensive immunohistochemical stains and possibly inaccurate results.

Please mention salient clinical details, including LMP on all gynaecological specimens.

Please indicate laboratory number and date of any previous biopsies.

Mark request URGENT if an urgent report is required. In such cases the request form should include the name and bleep number of the doctor in charge of the case.

## **Specimens**

All specimens must be in at least 20 times their volume of fixative.

Specimens other than small biopsies are examined after 24 hours fixation.

Routinely, small biopsies are reported the day after receipt in the laboratory.

All specimens must be labelled correctly with patient details and site of biopsy and should accompany properly filled in histology request forms.

## **Frozen Sections**

Wherever possible frozen sections should be arranged in advance by telephoning the Histology Department or one of the Consultant Histopathologists.

## **Muscle Biopsy for Histochemistry**

These specimens must be unfixed and sent by special transport to Royal Preston Hospital before mid-afternoon. Prior arrangements must be made with Neuropathology at RPH.

## **Tissue Biopsies for Immunofluorescence**

These specimens should be collected into transport medium (available from Histology) and then sent immediately to the Department. Please inform Histology before taking biopsy.

## **Cytology**

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## **Request Forms**

Please include relevant clinical details.

A special form is available for cervical cytology.

Mark request "URGENT" if an urgent report is required.

## **Specimens**

### **Sputum**

Please provide an early morning, deep cough specimen, on each of three consecutive days. Send to the laboratory immediately after collection.

### **Fluids (Ascitic, Pleural, etc)**

Please send to the laboratory immediately after collection.

### **Urine**

Bottles containing preservative are available from the Cytology department. The specimen should not be the first voided morning sample but ideally the second voided sample.

### **Fine Needle Aspirations**

Collecting fluid is available from Cytology.

1. Aspirate collecting fluid into the syringe used for the procedure.
2. Squirt collecting fluid with the aspirated material back into the collecting pot and send to the laboratory.
3. Please ensure the specimen pot is fully labelled.

A separate sheet, with more detailed information is available from Cytology.

### **Seminal Fluid**

#### Appointments for semen analysis for fertility investigations

Please inform any patient who requires semen analysis for fertility investigations to telephone the laboratory on (01254) 294380 for an appointment.

Once the patient has made an appointment, an instruction letter detailing the appropriate abstinence period prior to producing the specimen and information on how to collect the sample will be sent out to the patient confirming the date and time the specimen should be brought to the laboratory specimen reception.

The patient will receive a signed request form to bring in with the specimen and a 60ml wide-necked container in which to pass the sample.

Patients should receive an appointment within 2 weeks.  
Any specimen arriving without an appointment may not be tested.

## Post Vasectomy Semen Analysis

The appointment system is applicable to semen samples for fertility investigations only. Post vasectomy semen samples may be brought to the laboratory specimen reception any time between 8.45am and 4.00pm Monday to Friday.

### MORTUARY

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#### **Enquiries**

Chief MTO –	86067
Senior MTO - Mr D Corry	86067
MTO Ms. Gemma Halliwell	86067
Coroner's Officer – WPC Lynne Farnworth	
John Farnworth (page via Switch)	
Bereavement Officer – Mrs S Jones.	

#### **Consent Forms for Hospital Post Mortems**

These are available from the patients services office. A signed copy of the consent form must be given to the relative(s), a second copy must be placed in the case notes and the final copy sent to the mortuary with the patient's case notes. A post-mortem will be performed as soon as possible after this. Following a request by an attending doctor, Sheila Jones is available to provide relevant information and assistance with completion of the consent form.

#### **Deaths Reportable to the Coroner**

Basic Rule  
Sudden  
Violent  
Unnatural  
Unexpected  
Unexplained

The following should all be reported to the Coroner:-

#### **Cause not absolutely clear**

If the Doctor is not absolutely sure as to the cause of death a post-mortem must be carried out. A doctor cannot certify if they have not seen the deceased within 14 days prior to death. \*

#### **Accidents and injuries**

Of any date, if possibility they have contributed to cause of death

**Head injuries, fractures** All reportable. \*

**Septicaemia**

If resulting from ANY injury, including pressure sores.

**Short stay (under 24 hours)** All Reportable. \*

**Operations and anaesthetics**

Death during or within 24 hours of operation, before recovery from anaesthesia or death which may be attributable to operation. A person ventilated at this time may also have to be reported.

**Procedures**

Deaths following invasive hospital procedures.

**Psychiatric patients** All reportable.

**Industrial disease**

All reportable, pneumoconiosis, silicosis, byssinosis, asbestosis etc, all diseases and poisons covered by Factories Act of Health and Safety. May affect pensions rights of relatives. \*

**War pensioners**

All reportable, may affect pension rights of relatives. \*

**Carcinoma bronchus**

All reportable, may be related to previous employment. \*

**Bronchitis and emphysema**

Where the deceased was a miner.

**Crime/suspected crime**

Murder, manslaughter, death by reckless driving.

**Persons in legal custody**

All reportable.

**Drugs**

Overdose, self administered or otherwise.

**Self neglect/neglect**

Personal or lack of care by others.

**Hypothermia**

When body temperature has been lowered by cold, not illness, and

death occurs.

### **Infants and children**

All cot deaths, ill-treatment, neglect, starvation, battering and where cause is not immediately apparent.

### **Stillbirths**

Possibility or suspicion that child was born alive.

### **Abortions**

Other than natural or legal.

### **Alcoholism**

Chronic or acute, must be reported for statistical reasons.

### **Hepatitis B, Salmonella**

All reportable.

### **Legionella**

### **Relatives alleging malpractice**

All reportable for protection of all concerned.  
lack of care, etc

### **\* Notes**

Not all cases reported to the Coroner will necessarily have a post-mortem carried out, some are for statistical reasons or in the Public interest. For example, short stay patients may well be cleared by the Coroner without a post-mortem, and the Doctor is told to certify but the Coroner insists that they are all reported.

Coroner's post- mortems do not require permission from relatives. If the Doctor is not ABSOLUTELY sure in his/her own mind as to the cause of death then it MUST be reported to the Coroner. Hospital Post-mortems should only be carried out if the Doctor has been able to certify first, and provided no relative objects.

NB The Coroner has no objection to a Doctor observing a Coroner's post- mortem.

In certain cases, the Registrar will refuse to register a death if the cause given is reportable to the Coroner. They will advise the Coroner and a post- mortem may then be ordered. This can be very distressing to relatives, as it can then cause delays to funeral arrangements and should be borne in mind when Doctors are completing death certificates

If in doubt, the Coroner's Officers, will always advise. They are contactable via the hospital switchboard.



Please remember that the Coroner works in the public interest, he is there to establish facts, and remains impartial. A death, which is reportable to the Coroner, does not have to mean trouble, most cases reported are straightforward and cleared to the Registrar very quickly.

### **Registration of Deaths at Weekends and Bank Holidays (Burials only)**

#### **(BLACKBURN DISTRICT REGISTRARS ONLY)**

The Registrar of Births, Deaths and Marriages has now extended the weekend service to cover the period between 1.00pm and 5.00pm on a Saturday and between 10 am and 4pm on a Sunday and a Bank Holiday.

The Registrars appointed for this purpose have been provided with mobile telephones, which are switched on only during the above hours. They are based at home and are called out as necessary to issue Disposal Certificates. Where a Death Certificate is issued after lunchtime on a Saturday or, where appropriate, Sunday, the relatives, if they wish to immediately register the death, should be advised to contact the Registrar on the following numbers:-

Mobile phone – 0774 8766144  
0774 8766145

The Registrar will then make arrangements to meet with the relatives and issue the relevant Disposal Certificate. Facilities have been made available for this Purpose at RBH. However, Ward staff should leave the relatives to make their own arrangements with the Registrar.

After the Disposal Certificate has been issued, the Registrar will contact the Hospital Switchboard in order to arrange for the Mortuary Technician to be called in to release the body

The above procedure is not, of course, intended to cover cases where the Death Certificate cannot be completed or where the death has been referred to the Coroner.

### **PROCEDURE REQUIRED FOR RECEIVING BODIES**

During Working Hours 8am to 4:30pm.

Wards should contact porters to transfer the deceased to the mortuary. Ambulance, undertakers and the Police can transport deceased from the community to the mortuary without prior contact with the mortuary staff.

Outside working Hours

Hospital deaths : wards should contact the porters to transfer the deceased to the mortuary. If relatives wish to arrange a viewing of the deceased, switchboard will contact the on call mortuary staff to arrange this.

### Community Deaths

In most cases, out of hours, access is provided to the mortuary by the hospital porters. Undertakers or Police should contact the porters via switchboard. The on call mortuary staff are contacted via switch board when they are required to attend, eg. Police identifications, Home Office, forensic cases.

## **IMMUNOLOGY**

Immunology tests are carried out in two Laboratories, which together comprise a sub-regional service. They are analysed at the Preston District Laboratory (autoantibody and cellular work). Specimens should be sent to the Bloodsciences, where transportation to Preston will be arranged.

### **Telephone Enquiries**

Immunology (Preston)                      01772 710134

### **Tests Available/Specimens Required**

A complete list of tests offered by the Immunology service can be found on the reverse of the special Immunology request form. A 10 ml clotted blood sample is adequate for most tests, with the following exceptions: -

### **Cellular Immunology**

These tests can be undertaken after prior consultation with the Laboratory at RPH. Advice will be given by the Laboratory as to the appropriate specimen required.

### **CSF for Protein Studies (including Oligoclonal Bands)**

For correct interpretation of the results a matching serum specimen should be sent.

### **Tissue Typing**

Heparin-Dextran bottles are available on request. The sample must be taken within the period Monday-Thursday.

## **REFERRAL LABORATORIES**

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Below is a list of those laboratories routinely used by Cellular Pathology for referral purposes:

<b><u>Laboratory</u></b>	<b><u>Address</u></b>	<b><u>Accredited By</u></b>	<b><u>Certificate No</u></b>
Institute of Ophthalmology	Bath Street, London, EC1V 9EL	CPA	2103
Llandough Hospital	Cellular Pathology, Llandough Hospital, Penarth, South Glamorgan, Wales, CF64 2XX	CPA	0740
Royal Preston Hospital	Dept of Neurology, RPH, Sharoe Green Lane, Fulwood, Preston, PR2 9HT	CPA	0791

## **MICROBIOLOGY DEPARTMENT**

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### **Telephone Enquiries**

#### Consultant Microbiologists

Dr R R White (Bleep through Switchboard)	85904
Dr N Rotowa (Bleep through Switchboard)	84376
Dr K Burch (Bleep through Switchboard)	84294
Microbiology Manager Mr M Gray	84350
Chief BMS                      Mr I Byrom	84173
Laboratory Office (for results after two days)	84541

Enquiries about the diagnosis and management of patients with proven or suspected microbial diseases are welcomed.

### **Request Forms**

Please use the following coloured forms: -

- Microbiology – blue/green

- Virology – purple
- Immunology - brown

In addition to full and legible patient details, please give relevant clinical information, including details of recent foreign travel and recent, current and/or proposed treatment with antibiotics. . Insufficient information may lead to application of inappropriate or insufficient laboratory techniques and misleading results may ensue.

### **Collection of Specimens**

(All specimens in a plastic bag with attached request form)

Good quality results in Microbiology are highly dependent on the care with which specimens are collected. If this duty is delegated, please ensure that staff are adequately instructed. Whenever possible, specimens should be collected before starting antibiotics.

### **Transport/Storage of Specimens**

Specimens should [be sent to the laboratory](#) as soon as is practicable to prevent the death of fastidious micro-organisms and/or overgrowth of the pathogens by competing micro-organisms. If delay is inevitable, damage to the specimen is minimised by storage at optimal temperatures. In general, these are :-

- Room temperature - swabs for Microbiology.
- Refrigerator (4 C) - urine, faeces, sputa, tissue, CSF, blood for serology and chlamydia swabs.
- Blood cultures should be sent directly to Microbiology at all times to ensure prompt incubation (in the automated growth monitoring system).

Make sure that the specimens are labelled and accompanied by a completed request form. Specimens from patients who may have a "blood borne virus disease" (i.e. Hepatitis and HIV) MUST be sent in a sealed plastic bag labelled "Danger of Infection". " Danger of Infection " stickers should also be put on samples and request forms for patients with suspected or untreated tuberculosis, typhoid, brucellosis or CJD (or similar diseases).

### **Types of Specimens**

**Pus**

Pus collected into a sterile container is much more satisfactory than a swab of the pus.

## **Tissue**

Tissue from the lesion is also excellent, particularly for suspected tuberculosis. Send to the laboratory immediately in the dry state or in a small volume of sterile saline.

## **Swabs**

Sample the selected site carefully, avoiding contamination from adjacent area, especially skin and mucous membranes, which may harbour a normal microbial flora.

## **Urine**

Prepare the patient before collection (see nursing procedure book).

For routine cultures, boric acid bottles are used.

Urine for dysmorphic RBCs must be performed on very fresh urine – arrange with Consultant Microbiologist in advance.

Urine for chlamydia tests, please send first voided urine sample (i.e. the first sample passed that day) in a non-boric acid sterile container (universal container)

### **Urine for TB**

Three consecutive early morning urine specimens are collected into special containers available from the Microbiology Department.

## **Sputum**

- a) The patient expectorates into a dry sterile container. Do not send saliva.
- b) Respiratory secretions aspirated into a sterile 'trap' bottle.

## **Faeces**

A full clinical history including foreign travel and any possibility of food poisoning must be supplied. Use blue faeces container.

## **CSF**

Use sterile 30ml plastic "universal containers" (conical base), also a fluoride bottle for glucose estimation. A concurrent blood glucose sample should also be sent.

### **Chlamydia diagnosis (PCR)**

Special swabs and instructions are available from the Microbiology Department.

### **Fluids (Joint, Peritoneal, Pleural etc)**

Send in a dry, sterile container (e.g. a "universal bottle" or a sputum container and not a boric acid container). Synovial fluids on which a cell count is requested require an additional lithium heparin sample.

### **Nail/Skin Scrapings (Mycology)**

Collect in a folded paper, transported in a dry sterile container. The larger the sample the better the chance of isolating a pathogen.

### **Other Swabs**

Available from Microbiology - small ENT swabs and pernasal swabs for Bordetella pertussis diagnosis.

### **Worms/Lice/Fleas**

For identification, send in a sputum container.

### **Specimens for Enterobiasis (Threadworms)**

Contact Microbiology lab for "paddle" and instructions.

### **Blood Tests**

With the exception of Meningococcal PCR the following tests should be collected into a plain brown-capped tube

<b>Test</b>	<b>Amount</b>
Anti-staphylococcal antibodies	5 ml
Anti-Streptolysin Titre	5 ml
Antibiotic Assay	5 ml
Brucella Agglutinations	5 ml
Farmer's Lung etc	5 ml
Lyme Disease	5 ml
Meningococcal Antibodies	5 ml
Meningococcal PCR	2.5ml PINK EDTA
Parasite Serology	5 ml

Rheumatoid Factor	5 ml
Rubella Antibodies	5 ml
Syphilis Serology	5 ml
Toxoplasma	5 ml
Virus Studies	5 ml
Paul Bunnell	5 ml

A standard set of blood cultures comprises a blue-topped (aerobic) bottle and a purple-topped (anaerobic) bottle. A green-topped bottle (containing antibiotic adsorbing charcoal) should be used where the patient is currently on antibiotic treatment. This bottle can be used to supplement the standard set or can be used to replace the blue-topped (aerobic) bottle. It may increase the yield from patients already receiving antibiotics. The increased yield is mainly with Gram positive organisms and its use is particularly recommended in cases of suspected endocarditis. Use a single yellow-topped (aerobic, with charcoal) for paediatric cases.

### **Reporting Results**

Positive findings of the examination of the following specimen types and antibiotic assays are telephoned from the Laboratory as soon as they become available: -

Blood cultures, CSF, faeces, specimens for tuberculosis.

We welcome enquiries regarding specimen collection, transportation and storage of specimens and details of any undue delay in receiving results of investigations.

### **Antibiotic Assays**

*Gentamicin and Vancomycin assays are now performed routinely in the Biochemistry department.* Any urgent requests or out of hours requests should follow the protocol for urgent samples in Biochemistry. However the following guidelines still apply.

All samples for assay should be taken into a plain clotted tube. 5ml of blood should be collected, although smaller volumes can be assayed from paediatric patients. As far as possible samples should be collected in such a way as to permit performing the assay within normal laboratory hours.

### **Vancomycin**

**Dosing**      Adults up to 1 gram, bd.  
                   Children 40mg/kg/day in two-three divided doses.

Reduced maintenance doses are necessary in-patients with renal impairment - seek advice from. Consultant Microbiologist

Vancomycin should be infused over at least 60 minutes to avoid 'red man' syndrome.

### **Monitoring**

The trough sample should be collected prior to the infusion and the peak sample 60 minutes after end of infusion, i.e. about 2 hours from beginning of the vancomycin infusion.

Daily monitoring of antibiotics is indicated only in exceptional cases.

Desired levels	Trough 5-10mg/l
	Peak 20-30mg/l

### **Gentamicin**

**Dosing** Dosing regimen depends on the clinical indication. The most common situation is suspected Gram negative sepsis in which case a once daily (od) schedule should be used. When gentamicin is used for its synergistic activity against streptococci in infective endocarditis a low dose bd regimen should be employed. Please discuss cases of infective endocarditis with a Consultant Microbiologist.

n 5 mg/kg/day as single dose up to a Max of 400mg

bd regimen 80 mg bd in adult with normal renal function

This may be given as an infusion over 30 minutes or bolus dose.

### **Monitoring**

#### **Once daily schedule:**

Collect a sample either at 18-24 hours post dose or a sample at 8 hours post dose.

The eight-hour post dose sample has the major advantage that the result will invariably be available before the next dose is due. A sample should be collected after the first dose. If the patient has normal renal function the second dose may be given without waiting for the result of the assay. If the creatinine is raised or the patient is oliguric, the assay result must be obtained before giving a second dose to ensure adequate clearance.



All patients must have a documented level in the notes before a third dose is given.

**bd schedule:**

Trough sample immediately before dose and peak level one hour post dose.

**Desired Levels:**

od regimen 18-24 hour post dose (trough) less than 1 mg/l

8 hour post dose 1.5 to 4 mg/l

bd low dose regimen - Endocarditis only

Peak 3 – 5 mg/l

Trough less than 2 mg/l

It is essential that the following information is given on all gentamicin requests:-

- (1) od or bd regimen
- (2) Time of dose prior to assay
- (3) Size of dose prior to assay
- (4) Time of sample for assay

The assay of samples arriving without this information may be delayed.

The Consultant Microbiologist will advise on any modifications to dosage required. If normal levels of antibiotics are achieved, monitoring is required 2-3 times a week if the renal function is unchanged.

## **INFECTION CONTROL**

### **Introduction**

Infection Control Team

Dr R R White – Consultant Microbiologist (BT bleep through switch)  
Dr N A Rotowa – Consultant Microbiologist (BT bleep through switch)  
Dr K Burch – Consultant Microbiologist (BT bleep through switch)  
Dr H Sacho – Consultant Microbiologist (based in Burnley)

Mrs Beverley Aspin - Senior Infection Control Nurse

Page #6 194 or via switchboard

Ms Vanessa Morris – Infection Control Nurse

Page #6 134 or via switchboard

Mrs Marion Willcocks – Infection Control Nurse Manager

Page #6 424 or via switchboard

Mrs Christine Jones – Infection Control Nurse

(based in Burnley)

Mr Michael Harrison - Infection Control Nurse

(based in Burnley)

The aim of the Infection Control team is to try to prevent the multiplication and spread of micro organisms, in order to prevent infections in both patients and staff.

#### REMEMBER INFECTION CONTROL IS EVERYBODY'S RESPONSIBILITY

Members of the Infection Control Team are always available (either during office hours or on call) for consultation and advice on matters which include –

- Isolation of patients
- Investigation of possible outbreaks of infection
- Aseptic procedures
- Guidance of implementing policies
- Any other queries you may have regarding infection

Please feel free to contact us with your problems.

#### **Blood and Body Fluid Precautions**

It is not possible to recognise all patients (or staff) who may be infected with "Blood Borne Viruses" (eg HIV, Hepatitis B, Hepatitis C etc). All patients are regarded as potentially infected. Hence all health care workers should use appropriate barrier precautions to prevent skin and mucous membrane exposure when contact with blood or body fluids is anticipated.

#### **Body fluids which should be handled with the same precautions as blood are:-**

1. Cerebrospinal fluid, peritoneal fluid, pleural fluid, synovial fluid, amniotic fluid, semen, vaginal secretions
2. Any other body fluid containing visible blood.
3. Saliva in association with dentistry.
4. Unfixed tissues and organs.

#### **WAYS TO AVOID EXPOSURE TO HIV AND BLOOD BORNE HEPATITIS VIRUSES IN THE HEALTH CARE SETTING**

1. Apply good basic hygiene practices with regular hand washing.
2. Cover existing wounds or skin lesions with waterproof dressings.
3. Take simple protective measures to avoid contamination of person and clothing with blood.

4. Protect mucous membrane of eyes, mouth and nose from blood splashes with eye protection and masks.
5. Avoid sharps usage wherever possible.
6. Employ a safe procedure for handling and disposal of sharps. Needles must be removed from syringes with the utmost care. Approximately 40% of self-inoculated accidents occur while re-sheathing needles. **THIS MUST NOT BE DONE.**
7. Clear up any spillages of blood promptly and disinfect surfaces as per Trust spillage policy (in Infection Control Manual).
8. Employ the procedure for the safe disposal of contaminated waste as per Trust disposal of clinical waste policy (in Infection Control Manual).

### **Use of Gloves**

Gloves should be used to protect the health care worker in the following situations. The type of glove used (surgical, examination or household) will depend on the task.

- 1 Any procedure where contamination with blood is may occur.
2. When cleaning equipment prior to sterilization or disinfection.
- 3 When handling chemical disinfectants.
- 4 When cleaning up any spillage of blood or body fluids.

### **Management of Accidental Exposure to Blood in Health Care Setting**

The site of exposure should be washed liberally with soap and water but without scrubbing immediately following any exposure. Exposed mucous membranes of conjunctivae should be irrigated copiously with water. If there has been a puncture wound, free bleeding should be encouraged but the wound should not be sucked.

Any incident must be reported promptly to senior staff and to Occupational Health Department. (See Occupational Health Code of Practice.)

### **Isolation**

The spread of infection to patients in hospital can be controlled by physical protection (isolation): the extent of this control varies with the methods used. Isolation can be applied in 2 ways: -

1. Source Isolation: The isolation of infected patients to prevent the transfer of their infection to others. A GREEN source isolation card and stop sign is displayed in the window of the isolation room.

Information is given on the card as to the precautions to take.

2. Protective (or 'reverse') isolation: To prevent the transfer of infective microorganisms to patients at special risk of infection (e.g. those with diminished resistance because of their illness or treatment).

A WHITE protective isolation card and stop sign is used for this purpose.

### **Viral Haemorrhagic Fever (VHF)**

Staff must contact a Consultant Microbiologist immediately before any admission or investigation is made on patients who may be suffering from VHF.

### **Major Outbreak of Infection in Hospital**

Hospitals are occasionally the setting for outbreaks of infection amongst patients and/or staff (e.g. Salmonellosis, Legionellosis etc). If you suspect any possibility that such an incident may be occurring please contact any of the Infection Control Team IMMEDIATELY.

### **Notification of Infectious Diseases**

All hospital doctors are asked to send written notification about infectious diseases to the Consultant in Communicable Disease Control, to ensure that measures are taken to limit the spread of the disease and to keep a register of infectious diseases so as to assess the effectiveness of control measures.

This notification is a legal obligation placed on a medical practitioner who suspects that a patient is suffering from a notifiable disease – absolute confirmation of the diagnosis is not necessary.

Notification forms should be sent to the Consultant in Communicable Disease Control even if details have already been forwarded by telephone to the Public Health or Microbiology Departments.

In addition to formal notification, for cases of meningococcal meningitis, septicaemia or pulmonary TB, please telephone Carol Palmer, TB Co-ordinator, Montague Health Centre. Out of hours (5pm to 9am and weekends) the Public Health Physician on-call should be notified by telephone about all cases of suspected meningococcal disease. The hospital switchboard holds the on-call rota

The following diseases are notifiable:

**Under the Public Health (Control of Disease) Act 1984:**

Cholera  
Food Poisoning  
Plague  
Relapsing Fever  
Smallpox  
Typhus

**Under the Public Health (Infectious Disease) Regulations 1988:**

Acute Encephalitis	Meningitis Meningococcal	Scarlet Fever
Acute Poliomyelitis	Septicaemia (without meningitis)	Tetanus
Anthrax		Tuberculosis
Diphtheria		Typhoid Fever
Dysentery	Mumps	Viral Haemorrhagic
Fever (amoebic or bacillary)	Ophthalmia Neonatorum	
Leprosy		Viral Hepatitis
Leptospirosis	Paratyphoid Fever	Whooping Cough
Malaria	Rabies	Yellow Fever
Measles	Rubella	

**VIROLOGY**

Some of the virology testing is carried out by laboratories in Preston or Manchester. Specimens should be sent to Microbiology at BRI where transportation is arranged (separate arrangements apply to Paediatrics, RBH).

**Telephone Enquiries**

Virology, Royal Preston Hospital

#6 247

Virology offers, or arranges, laboratory investigations for the diagnosis of virus, mycoplasma, rickettsia, chlamydia and toxoplasma infections.

Investigations performed will depend on clinical request and clinical information. Full clinical details, including date of onset of symptoms, must be given on the accompanying request form. Failure to do so may result in the specimen being rejected or inappropriate investigations being performed. Investigations for such infections can be broadly grouped into four categories:-

### **Serology**

Please supply 5-10ml clotted blood. In infections of acute onset, send the sample as soon as possible after onset and send a convalescent sample approximately 7-10 days later.

### **Virus Isolation**

Special swabs are available from the Microbiology Laboratory.

Urine - an equal volume added to special transport medium.

Faeces, tissue and CSF are placed in a dry sterile container.

### **Antigen Detection**

Nasopharyngeal aspirates for respiratory viruses should be transported in the trap by which they are collected.

Swabs for Chlamydia detection by PCR are available from the laboratory.

### **Electron Microscopy**

Faeces for electron microscopy must be placed in a blue faeces container. For vesicle fluid and other skin samples, please consult the Microbiology Department.

## **REFERRAL LABORATORIES**

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Below is a list of those laboratories routinely used by Microbiology for referral purposes:

<b><u>Laboratory</u></b>	<b><u>Address</u></b>	<b><u>Accredited By</u></b>	<b><u>Certificate No</u></b>
Hope Hospital	Hope Hospital Dept of Microbiology, Stott Lane, Salford, M6 8HD	CPA	0259
Manchester Royal Infirmary	Manchester Medical Microbiology Partnership, Manchester Royal Infirmary Dept of Medical Microbiology, Oxford Rd, Manchester, M13 9WL	CPA	0635
Newcastle HPA	Newcastle upon Tyne Hospitals NHS Trust, Freeman Hospital Department of Microbiology, Freeman Road, High Heaton Newcastle upon Tyne, NE7 7DN	CPA	0927
Preston HPA	Royal Preston Hospital Preston Microbiology Services, PO Box 202, Sharoe Green Lane, Fulwood, Preston, PR2 9HG	CPA ISO 15189	0550
Southampton HPA	Health Protection Agency South East, Southampton General Hospital HPA Southampton Laboratory, Level B South Block, Southampton, SO16 6YD	CPA	1005
University of Edinburgh	Division of Medical Microbiology, University of Edinburgh Medical School, Teviot Place, Edinburgh, EH8 9AG	Internal	N/A

## Sample Requirements in Biochemistry

Most investigations below can be conducted on a minimum of 5ml blood although a larger volume is preferable, collected into a brown-capped tube (Monovette).

### **Tests**

### **Profiles**

#### **Bone:**

Calcium  
Alk Phosphatase  
Albumin

#### **Liver:**

Alk Phosphatase  
T Bilirubin  
T Protein  
Albumin  
ALT

#### **Renal: (1)**

Sodium  
Potassium  
Urea  
Creatinine

#### Alpha-FetoProtein (2)

Amylase  
Angiotensin Converting Enzyme  
Alpha 1 Antitrypsin  
Anti-convulsant drugs and others  
Caeruloplasmin  
CEA  
Cholesterol, HDL  
Chol/Triglycerides (3)  
Cholinesterase  
C3 C4 Complement  
Copper

#### Cortisol (4)



Creatine Kinase (Total CK)  
Digoxin (5)  
Electrophoresis  
FSH and LH  
Gamma GT  
HCG (Sub-unit)  
17-Hydroxyprogesterone  
Immunoglobulins  
Lithium  
Ketones  
Magnesium  
Osmolality  
Paracetamol  
Phosphate  
Progesterone (6)  
Prolactin  
PSA  
Salicylate  
Schumm's Test  
Testosterone  
Theophylline (7)  
Thyroid Function  
Transketolase  
Troponin I  
Urate  
Zinc

Refer to the notes below for special requirements.

Glucose (Blood Sugar)  
(Yellow)

2.5ml NaF/Oxalate

### Notes

- (1) Send to lab as soon as possible
- (2) Collect between 16-18 weeks (NTD)
- (3) 14 hour fast required
- (4) For dynamic tests contact Biochemistry
- (5) Sample 6-8 hours after last dose
- (6) Day 22
- (7) Sample 2 hours post-dose or 4 hours post-dose for sustained preps

## **Blood Gases**

Collect the specimen into a heparinised plastic syringe ('Pulsator' from supplies). Exchange needle for a luer closure and mix gently. Attach adhesive named label to syringe and transport immediately to the laboratory on ice. Under no circumstances should the syringe be sent to the laboratory with the needle still in situ.

## **Rare Investigations**

Some of the less common tests require special patient preparation and specimen handling for valid results to be obtained. Requests for the following investigations should be made to the Biochemistry Department (BRI) who will advise on the current protocol.

ACTH  
Aldosterone  
Cryoglobulin  
Calcitonin  
Gastrin  
Glucagon  
Growth Hormone (HGH)  
Insulin  
PTH  
Renin  
VIP  
Vitamin D  
Pancreatic Polypeptide

## **Miscellaneous Investigations**

Alcohol	5ml	Gel (Brown)
Ascorbate (Vit C)	5ml	EDTA (Pink)
Carboxyhaemoglobin	5ml	EDTA (Pink)
Lactate	5ml	Li/Heparin (Orange)
Lead	5ml	Li/Heparin (Orange)

Special procedures such as sweat tests, glucose tolerance tests, xylose excretion, butter fat tests, are available by prior arrangement with the department.

## **Tests on Faeces**

Fat  
investigation of malabsorption, which suggests faecal fat is not a first line screen.

District guidelines are available for the

Occult Blood	Refer to HemaScreen protocol. Collect during meat free diet.
Porphyrins	Small sample.
Reducing Substances	Small sample, sent to lab immediately.
Faecal elastase	Small "pea" sample

### **Tests on Urine**

#### **Random** (Refer to the key below)

Urine (20-50 ml) collected into an appropriate container, generally without preservative is suitable for-

Amino Acid Chromatography  
 Bence Jones (a)  
 Bile Pigments and Urobilinogen  
 Drug Screen (a)  
 Indican  
 Ketones  
 Melanogen  
 Mucopolysaccharides  
 Osmolality (a)  
 Paraquat  
 Porphyrins (and PBG)  
 Pregnancy Test (b)  
 Reducing Substances

#### **24 hour Urine**

Bottles containing the appropriate preservative for a particular investigation are available from the BRI laboratory.

The following require acid preservative -

Calcium (Phosphate)  
 Free Catecholamines (HMMA, VMA)  
 5HIAA (Acetic Acid Preservative)  
 Magnesium

The following require thymol preservative

Creatinine (for clearance) (c)  
 Electrolytes (Urea, Nitrogen) (d)

Free Cortisol  
Iron  
Protein (d)  
Protein Selectivity (d) -24 hour urine accompanied by 10ml blood  
Urate

Contact Biochemistry regarding the following urine collections

Hydroxyproline  
Oxalate  
Vit C Saturation

- (a) **Essential** to collect urine in plain bottle - no preservative.
- (b) **Early morning** random urine.
- (c) Accompanied with 10mls blood sample during collection for creatinine.
- (d) **Essential not** to use acid preservative.

### TURNAROUND TIMES

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### MICROBIOLOGY

Many Microbiology tests require the natural process of microbial replication to take place, hence "same day results" which may be achievable on blood samples from other laboratory departments, are not applicable to most Microbiology tests. Good laboratory practice demands prolonged incubation of certain specimens to ensure absence of a particular micro-organism of interest (which means that very early reporting of a "negative" result may be erroneous). The Department is aware of the need to issue timely reports, hence prompt provisional reports may be followed by a later definitive result.

<b>Specimen Type</b>	<b>Frequency of Testing</b>	<b>Time from Receipt to result (working days)</b>
Urine	Daily	1 to 3 days
Swabs (Eye, ear, nose, throat, genital tract, soft tissue etc)	Daily	1 to 3 days
Pernasal for Bordetella Pertussis	Daily	7 – 10 days

Faeces (routine)	Daily	2 to 4 days
Faeces (parasites)	Weekly	1 to 7 days
Sputa (routine)	Daily	1 to 2 days
Mycology (microscopy and culture)	On Demand	1 to 3 weeks
Rheumatoid Factor	Daily (positive screens referred for SCAT)	1 to 2 days
TB	Twice weekly	Film 1 - 4 days Culture 6 - 10 weeks

Specimens for virology and bacterial serology are referred to other laboratories. Most results are reported directly to the source within 1 to 2 weeks.

## **HAEMATOLOGY**

<b>Test</b>	<b>Frequency of Testing</b>	<b>Time from Receipt to Result</b>
FBC/ESR	Daily (Urgent results telephoned on day of analysis)	1 day
Plasma Viscosity	Referred to Burnley	1 to 10 days
Blood Film	Daily	1 to 2 days
Reticulocytes	Daily	1 to 2 days
INR	Daily (Urgent results telephoned on day of analysis)	1 day

Coagulation Studies	Daily	1 day
Hb Screenings	Weekly	2 to 14 days
Sickle Cell Test	Daily	1 to 2 days
B12 and Folate	Daily	1 to 2 days
Ferritin	Daily	1 to 2 days
IGE and Rast	Daily	1 to 2 days
Hb A1C	Daily	1 to 2 days

### **BIOCHEMISTRY**

<b>Test Receipt</b>	<b>Frequency of Testing</b>	<b>Time from to Result</b>
Anticonvulsant Drugs	Daily	1 to 2 days
Bone (Ca, ALP, Alb)	Daily	1 to 2 days
Cardiac marker	Daily	same day
Cholesterol	Daily	1 to 2 days
Cortisol	Daily	1 to 2 days
Digoxin	Daily	1 to 2 days
Faecal Occult Blood	Daily	1 to 2 days
Free T3	Daily	1 to 2 days
Free T4/TSH	Daily	1 to 2 days
FSH/LH	Daily	1 to 2 days
Glucose	Daily	1 to 2 days
Lipids	Daily	1 to 2 days
Liver (Bili, ALP, ALT,Alb)	Daily	1 to 2 days

Pregnancy Testing	Daily	1 to 2 days
Progesterone	Daily	1 to 2 days
Prolactin	Daily	1 to 2 days
Renal (U&E)	Daily	1 to 2 days
Testosterone	Daily	1 to 2 days
Urate	Daily	1 to 2 days
Urea and Electrolytes	Daily	1 to 2 days
Urine 5-H1AA	Referred	Two weeks
Urine Catecholamines	Referred	Two weeks
Urine Protein	Daily	1 to 2 days

**NB**

Those tests conducted by the Biochemistry and Haematology Departments on a weekly basis are generally the less common tests which do not usually require a fast response. They are often quite labour intensive and use expensive reagents. For these reasons samples are stored on receipt until the next batch is processed. The turnround times for these tests will, therefore, be variable, depending on when the sample is received in relation to analysis of the previous batch.

Unfortunately, we are unable to specify the exact days on which these batched tests are performed as this depends on deployment of staff, availability of equipment and numbers of samples awaiting analysis. In general, the average response time is likely to be 7 days (one working week). It should be possible to advise you on an individual basis when the next batch is to be processed if you were to telephone the appropriate department. In exceptional circumstances, following discussion, we could consider providing an earlier response by bringing forward a batch.

## **HISTOPATHOLOGY**

### **Histology**

Small biopsies are usually reported in 2 - 5 days from receipt, whereas larger specimens need extended fixation and are usually reported in 3 - 5 days after receipt.

In some instances it may be found necessary to take extra blocks and/or apply special staining techniques, in such cases results will be delayed.

### **Cytology**

Routine cervical smears approximately 10 days from receipt.

Other cytology specimens take 2 - 3 days from receipt.

Seminal analysis usually takes between 1 and 2 days from receipt.

## **BLOOD TRANSFUSION**

<b>Specimen</b>	<b>Frequency of Testing</b>	<b>Time from Receipt To Result</b>
Group and Save	daily on request	same day result
Cross match	Daily on request	same day result
Fresh frozen plasma	Daily on request	Same day result
Concentrated platelets	Daily on request	Same day result
Paul Bunnell	Daily on request	1 - 2 days
Direct Coombs	Daily on request	1 - 2 days
Cold Agglutinins	Daily on request	1 - 2 days
Antenatal groups and	Daily on request	3 days
Non-urgent antibody	Daily on request	7 days
	antibody screens	
	Identification	



HLA-Typing	Daily on request	7 days
WBC + Platelet antibody screens	Daily on request	7 days

**PATHOLOGY ENQUIRIES - Cellular Pathology and all historical results prior to May 2006** [Return to Index](#)

**Ward Based Pathology Enquiries:**

The majority of wards and departments within the Trust are able to access either the Telepath Pathology computer system ( for all results prior to May 22<sup>nd</sup> 2006 or the Ice Pathology System to enquire on patient's results. Access is only available to staff who have an individual pathology User ID and Password. To obtain a User ID please contact the IT help desk on extension 3135

**Patient Search Instruction:**

To reduce the risk of errors when searching for patient details and results the following method of searching should be adopted by all staff using the Pathology system:

**Telepath System:**

**Minimum Information Search:**

1. At the Hospital Number prompt type: U (this stands for unknown) and Press ENTER.
2. At the Surname prompt type the patient's Surname. **NB.** In certain circumstances it may be possible to reduce the number of characters used to search for a Surname, for example when searching for a patient with Surname Robertson enter "ROB" in the Surname field and Press ENTER. The system will display all patient's whose Surname begins with ROB.
3. At the Forename prompt type the patient's initial e.g. A. **NB.** If this search does not display the required patient record, delete the initial and search again using surname or part of the surname only.
- 4 Please leave the patient's sex blank - just press ENTER through this prompt. **NB** The system will display all records Male, Female or Unknown.
5. Date of Birth is not required. Press ENTER through this field.

6. The Pathology system will now search for patients who match this criteria listing them so that you may select the correct patient by entering the number found to the left of each record & pressing ENTER.
7. Earliest/Latest message will now appear. Press ENTER through both these options.
8. The patient's results will now display in date order  
- the most recent result will be at the top of the list.
9. Select the required result by entering the corresponding number (found to the left of each result) in the options field at the bottom of the screen and press ENTER
10. When you have viewed all required results Quit back to a blank enquiry screen. Return to the small options screen by pressing ENTER
11. To exit from the Pathology System press ENTER without selecting an option.

By using this method of searching you will be able to see if any patients have been double registered on the Pathology system, therefore reducing the number of errors/problems encountered or results attached to duplicate records.

#### **ICE PATHOLOGY SYSTEM:**

- 1 . Log into the Ice system
2. Select the patient search option.
3. Enter your patient's surname, forename. Press ENTER
4. All patients with the requested search criteria will now display. Select the required patient record by clicking on that row.
5. All the results for this patient will now be displayed. Click on the row to display the required results.

**Accessing Patient's INR Dosage:**    [Return to Index](#)

1. Select the Pathology Option from your Menu.
2. At the login: prompt type "tpath " (in small letters) and press ENTER
3. At User ID: prompt, type your individual User ID and press ENTER
4. At Password: prompt, type your secret password.
5. The Copyright screen will appear for approx. 30 seconds.
6. When the small pathology menu appears - select Option 1 Single Point Enquiry and press ENTER.
7. Complete the minimum information search as described above.
8. View the most recent HAE result and note down the specimen number omitting the leading zeros.
9. If you have more than one patient requiring an INR result, it is a good idea to view the HAE results for all patients and note down their specimen numbers before moving on
10. Quit back to a blank enquiry screen by pressing Q and ENTER
11. To get back to the small pathology options menu - at a blank enquiry screen press ENTER
12. Selection Option 3 INRD and press ENTER
13. At the specimen number prompt: type H, (this must be a capital H followed by a comma) then the specimen number you have noted down.
14. The dosage screen will now display. Press the print screen button on your keyboard,
15. If you require further dosage information for other patients, type Y at the bottom of the screen when prompted to do so and repeat step 13
16. When you have requested all patient doses - press ENTER until you have logged yourself out of the Pathology system
17. Return to the Main Menu.

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17 HYDROXYPROGESTERONE	OHPROG	Up to 20 nmol/l	Brown
ACTH	ACTH	Less than 50 ng/l	10 ml Orange
ALANINE TRANSAMINASE (ALT)	ALT	3 - 53 IU/l	Brown
ALBUMIN	ALB	35 - 50 g/l	Brown
Albumin excretion rate	AER	Less than 30 ug/min	Timed urine
Albumin ( microalbumin)		less than 30 mg/l	urine
ALDOSTERONE (AMBULANT)	ALDO	450 +/- 220 pmol/l	Contact Biochem
ALDOSTERONE (RECUMBENT)	ALDO	220 +/- 70 pmol/l	Contact Biochem
ALKALINE PHOSPHATASE (ADULTS)	ALP	30 - 130 IU/l	Brown
ALKALINE PHOSPHATASE (CHILD 3-15 YRS)	ALP	100 - 390 IU/l	Plain
ALKALINE PHOSPHATASE (CHILD UNDER 3)	ALP	UP TO 500 IU/l	Plain
Alpha-1 Acid Glycoprotein	AAG	0.4 - 1.0 g/l	Brown
ALPHA 1 ANTITRYPSIN Male	AAT	1.13 - 2.42 g/l	Brown
ALPHA 1 ANTITRYPSIN Female	AAT	1.22 - 2.80 g/l	Brown
ALPHA FETO PROTEIN (LIVER)	AFP	Less than 20 KU/l	Brown
ALUMINIUM	Al	Less than 10 ug/l	10 ml Orange
ALUMINIUM (dialysis patients)	Al	LESS THAN 60 ug/l	10 ml Orange
AMIODARONE	AMIO	0.5 - 2.6 mg/l	Brown
AMIODARONE METABOLITE (D.E.A.D.)		0.5 - 2.6 mg/l	Brown
AMMONIA	AMM	11 - 32 umol/l	Brown
AMYLASE	AMY	30 - 110 IU/l	Brown
ANDROSTENEDIONE (FEMALE ON O/C)		2.0 - 8.0 nmol/l	Brown
ANDROSTENEDIONE (FEMALE)		1.8 - 12.0 nmol/l	Brown
ANDROSTENEDIONE (MALE)		5.5 - 11.0 nmol/l	Brown
ANGIOTENSIN CONVERTING ENZYME (ACE)	ACE	15 - 55 IU/l	Brown
ARSENIC (BLOOD)		LESS THAN 0.53 umol/l	Contact Biochem
ARSENIC (URINE)		LESS THAN 0.67 umol/l	Contact Biochem
ARTERIAL BLOOD ACTUAL BICARBONATE	HCO3	22 - 30 mmol/l	Blood Gas
ARTERIAL BLOOD BASE EXCESS	BE	-3 - +3 mmol/l	Blood Gas
ARTERIAL BLOOD pCO2	PCO2	4.67 - 6.00 kPa	Blood Gas
ARTERIAL BLOOD pH	pH	7.35 - 7.45	Blood Gas
ARTERIAL BLOOD pO2	PO2	11.3 - 14.0 kPa	Blood Gas
ARTERIAL BLOOD STD BICARBONATE	SBC	22 - 26 mmol/l	Blood Gas
Ascitic Fluid Protein		< 20 g/l TRANSUDATE >30 g/l EXUDATE	
Aspartate Transaminase (AST)	AST	14 - 59 IU/l	Brown
BICARBONATE	HCO3	23 - 31 mmol/l	10 ml Orange
BILE ACIDS	BA	0 - 9 UMOL/L	Brown
BILIRUBIN	TBILI	UP TO 22 umol/l	Brown
BUTTER FAT TEST		MIN.INCREASE OF 0.3mmol/l TRIGS.AT 2HRS EXC MALABSORBTION	Brown
C REACTIVE PROTEIN	CRP	LESS THAN 10 mg/l	Brown
C1 ESTERASE INHIBITOR	C1EI	0.15 - 0.35 g/l	Brown
C3 (SERUM)	C3	0.75 - 1.65 g/l	Brown
C4 (SERUM)	C4	0.20 - 0.65 g/l	Brown
CA 125	CA125	Normal = <17 U/ml Abnormal = >35 U/ml	Brown
CA 19-9	CA19-9	Up to 35 KU/l	Brown
CAERULOPLASMIN (under 3 months)	CAER	80 - 230 mg/l	Brown
CAERULOPLASMIN (adults)		200 - 450 mg/l	

Caffeine	CAFF	25 - 100 umol/l	Brown
CALCITONIN	CALTN	Less than 0.08 ug/l	10 ml Orange
CALCIUM	Ca	2.10 -2.60 mmol/l	Brown
CARBAMAZEPINE	CARB	17 - 42 umol/l	Brown
Carnitine Total		36.2 - 51.8	
Free		27.5 - 37.5	
Bound		4.1 - 14.3	
CAROTENE (Beta)	CARO	0.2 - 1.4 umol/l	Brown
CEA	CEA	Up to 10 ug/l	Brown
CHLORIDE	Cl	95 - 107 mmol/l	Brown
CHOLESTEROL	CHOL	Desirable = < 5.2 mmol/l	Brown
CHOLESTEROL HIGH DENSITY (HDL)	HDL	Desirable = > 0.8 mmol/l	Brown
CHOLESTEROL LOW DENSITY (LDL)	LDL	Desirable = < 4.0 mmol/l	Brown
Cholinesterase		0.62 - 1.37 KU/l	Brown
TRIGLYCERIDES (FASTING)	TRIG	Desirable = < 1.8 mmol/l	Brown
COMPLEMENT C3	C3	0.75 - 1.65 g/l	Brown
COMPLEMENT C4	C4	0.2 - 0.65 g/l	Brown
COPPER	CU	13 - 26 umol/l	Brown
CORTISOL 9AM	CORT	175 - 650 nmol/l	Brown
CORTISOL MIDNIGHT	CORT	Less than 175 nmol/l	Brown
CORTISOL SYNACTHEN TEST (SHORT)	CORT	Inc to at least 550 nmol/l	Brown
CORTISOL URINE FREE (FEMALE)	UCORT	Less than 300 nmol/24hrs	Thymol Bottle
CORTISOL URINE FREE (MALE)	UCORT	Less than 350 nmol/24hrs	Thymol Bottle
CORTISOL/CREATININE RATIO		5 - 55 umol/mol	Thymol Bottle
CREATINE KINASE	CK	30 - 175 IU/L	Brown
CREATININE	CREAT	60 - 129 umol/l	Brown
CREATININE CLEARANCE	CCL	90 - 130 ml/min	Brown & Thymol Bottle
CSF GLUCOSE	CSFGL	2.5 - 5.6 mmol/l	2ml yellow
CSF PROTEIN	CSFP	Less than 0.6 g/l	Plain
Cyclosporin (Preston)	CYC	60 - 250 nmol/l	5 ml Pink
DEHYDROEPIANDROSTERONE SULPHATE F	DHEAS	2.2 - 10.0 umol/l	Brown
DEHYDROEPIANDROSTERONE SULPHATE M	DHEAS	2.2 - 13.0 umol/l	Brown
DIGOXIN	DIG	1.2 - 2.6 nmol/l	Brown
Elastase (Faecal)		> 200 iu/	
EFFUSIONS;EXUDATE		Protein - > 30 g/l	Plain
EFFUSIONS;TRANSUDATE		Protein - < 20 g/l	Plain
Erythropoietin		5- 25 IU/L	
ETHOSUXIMIDE (ZARONTIN)	ETHOSX	283 - 708 umol/l	Brown
FOLLICLE STIMULATING HORMONE (FSH)	FSH	0.5 - 7.0 IU/l	Brown
FREE ANDROGEN INDEX	FAI	0 - 7.1	Brown
FSH Post menopausal	FSH	Greater than 15 IU/l	Brown
FSH male	FSH	0.5 - 7.0 IU/l	Brown
Fructosamine		205 - 285 umol/l	Brown
GAMMA GLUTAMYL TRANSFERASE (GGT)	GGT	0 -65 IU/L l	Brown
GASTRIN	GAST	Less than 40 pmol/l	Contact Biochem
GLUCAGON	GLUCA	Less than 50 pmol/l	Contact Biochem
GLUCOSE	GLUCF	Fasting - 3.0 - 6.0 mmol/l	2ml yellow
GLUCOSE 2 hrs post prandial	GLUC	Maximum - 7.8 mmol/l	2ml yellow
GROWTH HORMONE (GH)GTT SUPPRESSION TEST	HGH	Normals suppress < 2 mU/l	Brown
GROWTH HORMONE (GH)INSULIN STRESS TEST	HGH	>15 mU/l excludes GH def	Brown

Haptoglobin		0.2 - 2.0 g/l	Brown
HIGH DENSITY LIPOPROTEIN (HDL)	HDL	Desirable > 0.8 mmol/l	Brown
Homocysteine		5 - 15 umol/l	Brown
HUMAN CHORIONIC GONADOTROPHIN (BHCG)	HCG	Less than 7 IU/l	Brown
IGF-1 (Adult aged 21-40)	IGF1	13 - 50 nmol/l	Brown
IGF-1 (Adult aged 41-60)	IGF1	9 - 40 nmol/l	Brown
IGF-1 (Adult aged >60)	IGF1	6 - 36 nmol/l	Brown
Immunoglobulin A (IgA)	IgA	0.8 - 4.0 g/l	Brown
Immunoglobulin G (IgG)	IgG	6.0 - 16.0 g/l	Brown
Immunoglobulin M (IgM)	IgM	0.5 - 2.0 g/l	Brown
IRON	Fe	8 - 32 umol/l	Brown
LACTATE	LACT	0.7 -2.4 mmol/l	5 ml Orange
LDH	LDH	313 - 618 IU/l	Brown
Lamotrigine (Pendlebury)		8 - 16 umol/l	Brown
LEAD	Pb	< 0.48 umol/l	5 ml Pink
LEAD Increased exposure		0.48 - 0.72 umol/l	
LEAD over exposure		> 0.72 umol/l	
LEAD (Occupational exposure)	Pb	up to 3.0 umol/l	
LITHIUM	LITH	0.6 - 1.2 mmol/l	Brown
LOW DENSITY LIPOPROTEIN (LDL)	LDL	Desirable < 4.0 mmol/l	Brown
LUTEINIZING HORMONE (LH) Exc cycle peak	LH	1.0 - 8.0 IU/l	Brown
LUTEINIZING HORMONE (LH) Post menopausal	LH	Greater than 20 IU/l	Brown
LUTEINIZING HORMONE (LH) Male	LH	1.0 - 8.0 IU/l	Brown
MAGNESIUM	Mg	0.70 - 0.90 mmol/l	Brown
MERCURY (24HR URINE)	Hg	Less than 50 nmol/24hrs	Plain Bottle
Metadrenaline (24 hr Urine Hope)	NOR	0 - 2 umol/24hrs	Acid Bottle
Normetadrenaline (24 hr Urine Hope)		0 - 4 umol/24hrs	Acid Bottle
MERCURY (BLOOD)	Hg	Less than 30 nmol/l	Contact Biochem
OESTRADIOL Follicular Phase	E2	80 - 200 pmol/l	Brown
OESTRADIOL Mid-cycle peak	E2	440 - 1375 pmol/l	Brown
OESTRADIOL Luteal Phase	E2	220 - 950 pmol/l	Brown
OESTRADIOL post -menopausal	E2	Less than 80 pmol/l	Brown
OESTRADIOL Male	E2	22 - 162 pmol/l	Brown
OESTRADIOL On HRT	E2	Optimal level 250-400 pmol/l	Brown
OSMOLALITY (SERUM)	OSM	275 - 295 mmol/kg	Brown
OSMOLALITY (URINE)	OSM	250 - 1300 mol/kg	Plain Bottle
Pancreatic Polypeptide		Less than 300 pmol/l	special tube
PARATHYROID HORMONE (PTH)	PTH	9 - 72 pg/ml	Brown
PHENOBARBITONE	PHENO	43 - 172 umol/l	Brown
PHENYTOIN (EPANUTIN)	PHENY	40 - 80 umol/l	Brown
PHOSPHATE	PO4	0.80 - 1.50 mmol/l	Brown
POTASSIUM	K	3.6 - 5.4 mmol/l	Brown
PRIMIDONE (MYSOLINE)	PRIM	23 - 45 umol/l	Brown
Procollagen peptide (PIIINP)	PIIINP	1.7 - 4.2 ug/l	Brown
PROGESTERONE (Post Ovulatory)	PROG	Greater than 25 nmol/l	Brown
PROLACTIN	PROL	Less than 500 mu/l	Brown
PROSTATIC SPECIFIC ANTIGEN (AGE 40 - 49)	PSA	less than 2.5 ug/l	Brown
PROSTATIC SPECIFIC ANTIGEN (AGE 50 - 59)	PSA	less than 3.5 ug/l	Brown
PROSTATIC SPECIFIC ANTIGEN (AGE 60 - 69)	PSA	less than 4.5 ug/l	Brown
PROSTATIC SPECIFIC ANTIGEN (AGE > 70 )	PSA	less than 6.5 ug/l	Brown
PROTEIN (Ascitic fluid)		<20 suggests transudate	Plain

PROTEIN (TOTAL)	TP	64 - 81 g/l	Brown
QUINIDINE	QUIN	2 - 4 mg/l	Brown
RENIN (Recumbent)		1.1 - 2.7 pmol/ml/hr	Contact Biochem
RENIN (Mobile)		2.8 - 4.5 pmol/ml/hr	Contact Biochem
Retinol		0.2 - 0.8mg/l	
SALICYLATE - ANALGESIA (adults)		Less than 150 mg/l	Brown
SALICYLATE - CHRONIC THERAPY FOR R.A.(adults)		Less than 300 mg/l	Brown
SEX HORMONE BINDING GLOBULIN (SHBG) Male	SHBG	11 - 71 nmol/l	Brown
SEX HORMONE BINDING GLOBULIN (SHBG) Female	SHBG	25 - 110 nmol/l	Brown
SODIUM	Na	136 - 145 mmol/l	Brown
SWEAT TEST	SWEAT	Chloride < 40 mmol/l Chloride > 40 < 60 is equivocal Cortisol to > 550 nmol/l.	Brown
SYNACTHEN TEST			
Tacrolimus (FK 506)		4 - 25 ug/l	Pink
T3(FREE)	FT3	3.0 - 7.1 pmol/l	Brown
T4(FREE)	FT4	11.8 - 32.5 pmol/l	Brown
TESTOSTERONE Female	TES	UP TO 2.6 nmol/l	Brown
TESTOSTERONE Male	TES	10 - 37 nmol/l	Brown
THEOPHYLLINE (Asthma)	THEO	55 - 110 umol/l	Brown
THEOPHYLLINE (Apnoea)	THEO	35 - 70 umol/l	Brown
THEOPHYLLINE (Neonatal Apnoea)	THEO	28 - 55 umol/l	Brown
Thiopurine Methyltransferase	TPMT	26 - 50 pmol/h/mgHb	
Thyroglobulin		less than 5 ug/l	BROWN
THYROID STIMULATING HORMONE(TSH)	TSH	0.3 - 5.0 mU/l	Brown
THYROXINE BINDING GLOBULIN (TBG)	TBG	7.0 - 18.0 mg/l	Brown
TRH TEST		TSH inc > 2mu/l excludes. hyperthyroidism	Brown
TRIGLYCERIDES (FASTING)	TRIG	Desirable - <1.8 mmol/l	Brown
Troponin	NTRO	Less than 0.2 microg/l	Brown
URATE (SERUM)	URA	0.15 - 0.5 mmol/l	Brown
URATE (URINE)	URA	3 - 12 mmol/24 hrs	Thymol Bottle
UREA	UREA	2.5 - 7.5 mmol/l	Brown
URINE RANDOM 5-HYDROXYINDOLE ACETIC ACID	24U5HI	LESS THAN 50 umol/l	Acid Bottle
URINE(24HR) 5-HYDROXYINDOLE ACETIC ACID (5HIAA)	24U5HI	16 - 73 umol/24 hrs	Acid Bottle
URINE(24HR) CALCIUM	24UCA	2.5 - 7.5 mmol/24 hrs	Acid Bottle
URINE(24HR) COPPER		Less than 1.1 umol/24 hrs	Acid Bottle
URINE(24HR) CORTISOL Male	24UCOR	Less than 350 nmol/24hrs	Thymol Bottle
URINE(24HR) CORTISOL Female	24UCOR	Less than 300 nmol/24hrs	Thymol Bottle
URINE CREATININE (Male)	24UCR	13.2 - 17.6 mmol/24 hrs	Thymol Bottle
URINE CREATININE (Female)	24UCR	7.04 - 13.2 mmol/24 hrs	Thymol Bottle
URINE(24HR) MAGNESIUM	24UMG	2.5 - 8.3 mmol/24 hrs	Thymol Bottle
URINE (24Hr) Metadrenaline (Hope)	24UME	0 - 2 umol/24hrs	Acid Bottle
URINE (24hr) Normetadrenaline (Hope)	24UNME	0 - 4 umol/24hrs	Acid Bottle
URINE(24HR) OXALATE	24UOX	0.08 - 0.49 mmol/24 hrs	Acid Bottle
URINE(24HR) PHOSPHATE	24UPO4	15 - 50 mmol/24 hrs	Acid Bottle
URINE(24HR) POTASSIUM	24UK	25 - 100 mmol/24 hrs	Thymol Bottle
URINE(24HR) PROTEIN	24UPRO	Less than 0.08 g/24 hrs	Thymol Bottle
URINE PROTEIN/CREAT RATIO		Up to 50	Thymol Bottle
URINE(24HR) SODIUM	24UNA	130 - 220 mmol/24 hrs	Thymol Bottle
URINE(24HR) URATE	24UURA	3 - 12 mmol/24 hrs	Thymol Bottle



URINE(24HR) UREA (MEAN VALUE)	24UURE	500 mmol/24 hrs (Diet Dependent)	Thymol Bottle
URINE(24HR) VMA		9 - 36 umol/24 hrs	Acid Bottle
VALPROATE (EPILIM)	VAL	350 - 700 umol/l	Brown
VASOACTIVE INTESTINAL PEPTIDE (VIP)	VIP	Less than 30 pmol/l	Contact Biochem
VITAMIN A	VITA	1.1 - 2.8 umol/l	Brown
VITAMIN C (ASCORBIC ACID)	VITC	45 - 80 umol/l	
VITAMIN C SATURATION TEST	VITC	Saturation within 3 days	
VITAMIN D (25 HYDROXY CHOLECALCIFEROL)	VITD	Vit D def =<10: Vit D replete>30	Brown
VITAMIN D (1,25 DIHYDROXY CHOLECALCIFEROL)		20 - 50 pg/ml	Brown
VITAMIN E (Tocopherol)	VITE	5 - 15 mg/l	Brown
XYLOSE ABSORBTION TEST (5g DOSE)	XYL	Level > 30 mg/100ml at 1hr excludes malabsorption	
XYLOSE EXCRETION (5g DOSE)	XYL	>1.2g excreted within 5 hrs	
ZINC	ZINC	10 - 24 umol/l	Brown

15.08.06